**JAI SHRIRAM ENGINEERING COLLEGE**
**TIRUPPUR – 638 660**
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Recognized by UGC & Accredited by NAAC and NBA (CSE and ECE)

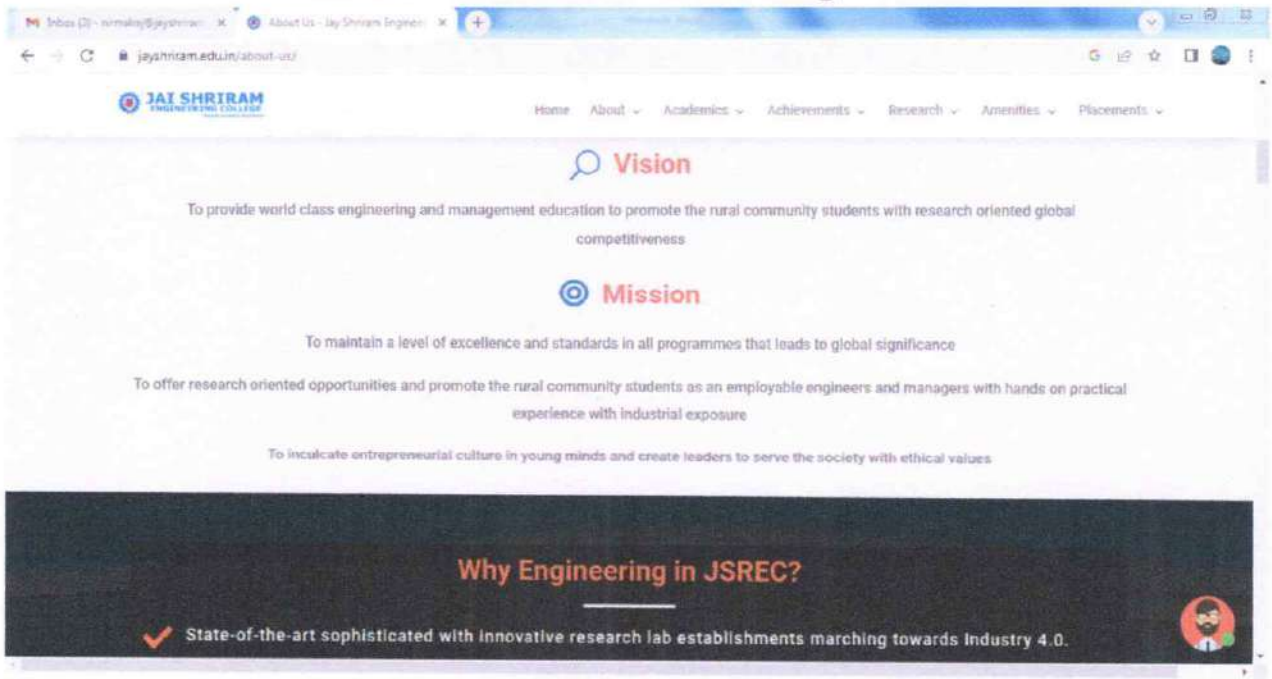
# Criterion 2- Teaching- Learning and Evaluation

## Key Indicator - 2.6 Student Performance and Learning Outcome

## 2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website

# About Jai Shriram Engineering College


# Vision and Mission of the College

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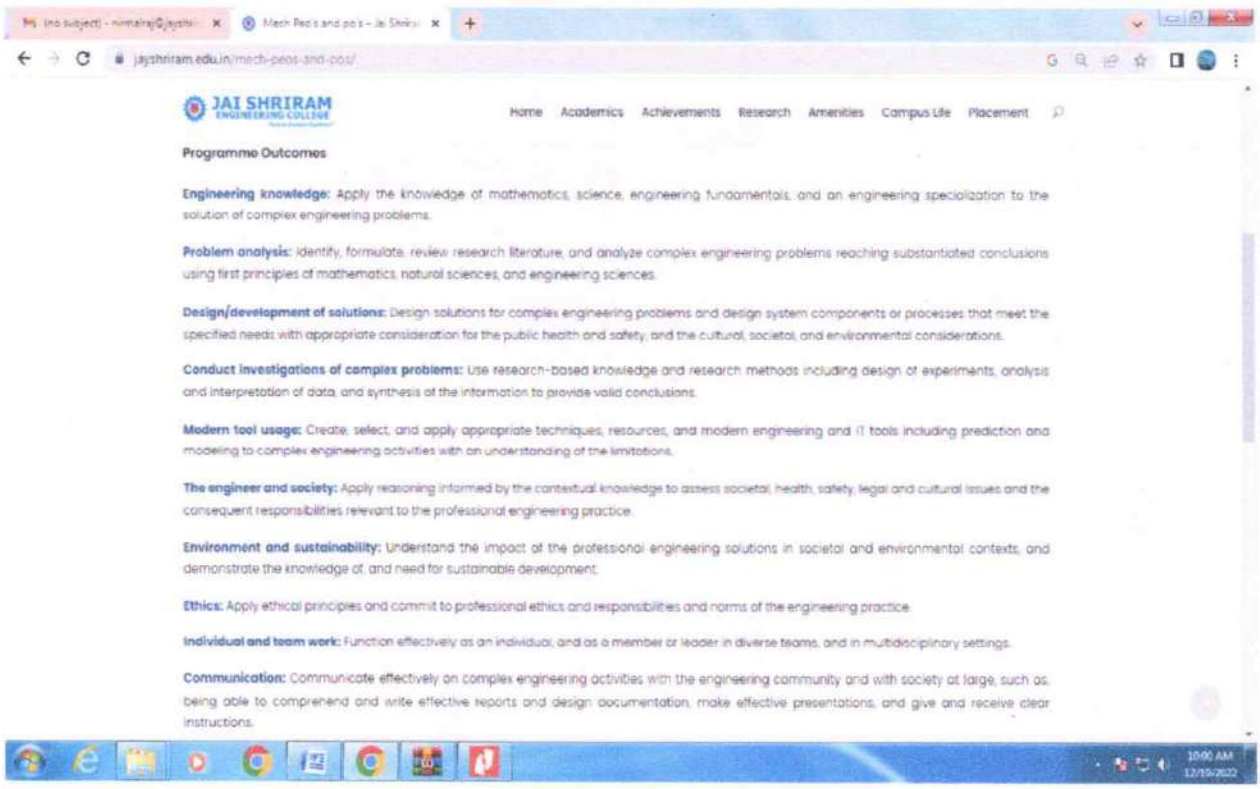
# Po's, PEO's, and PSO's are displayed on Institution website



JAI SHRIRAM ENGINEERING COLLEGE

Home Academics Achievements Research Amenities Campus Life Placement

jayshriram.edu.in/mech-peos-and-pos/

**Programme Outcomes**

**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

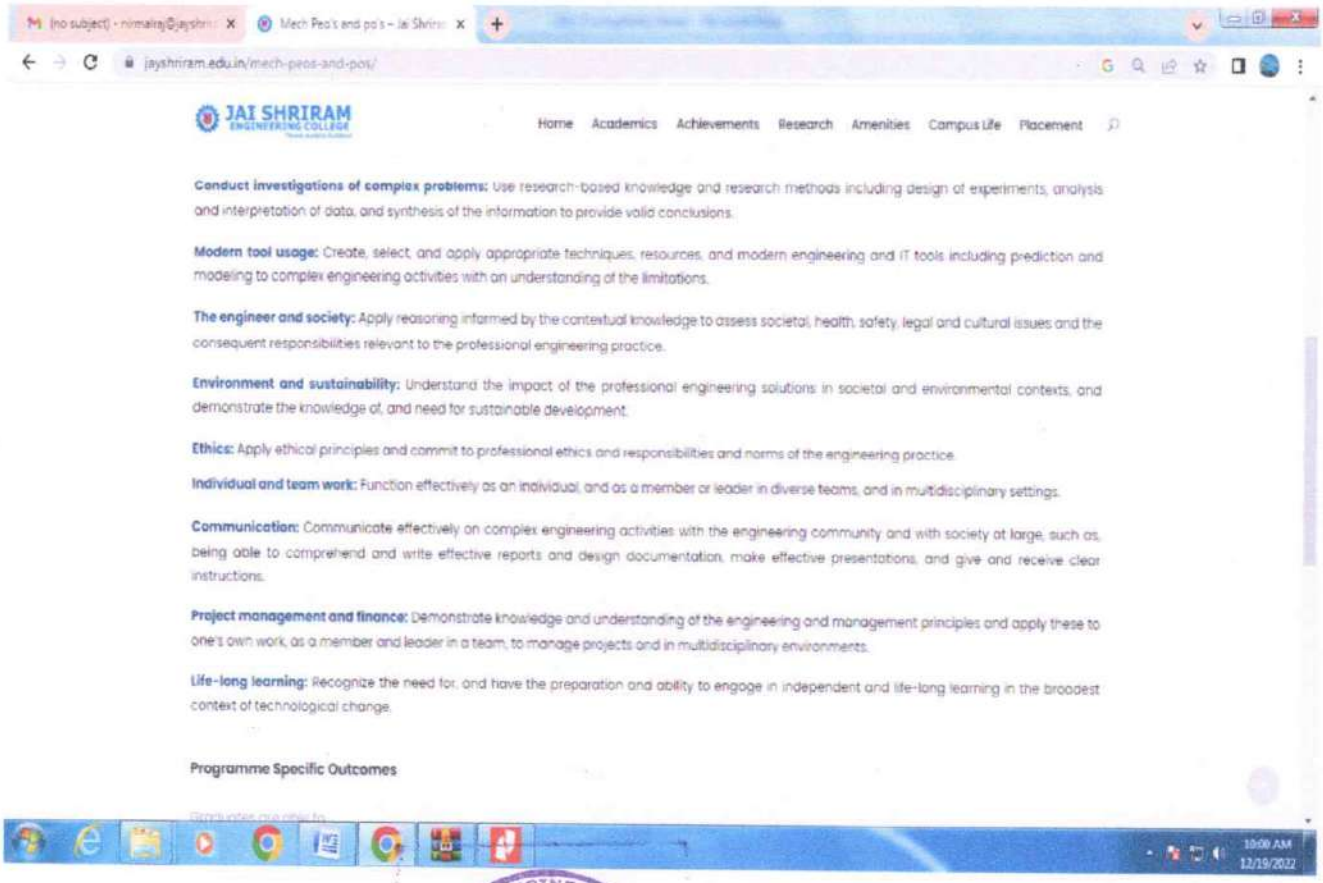
**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.



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**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Programme Specific Outcomes**

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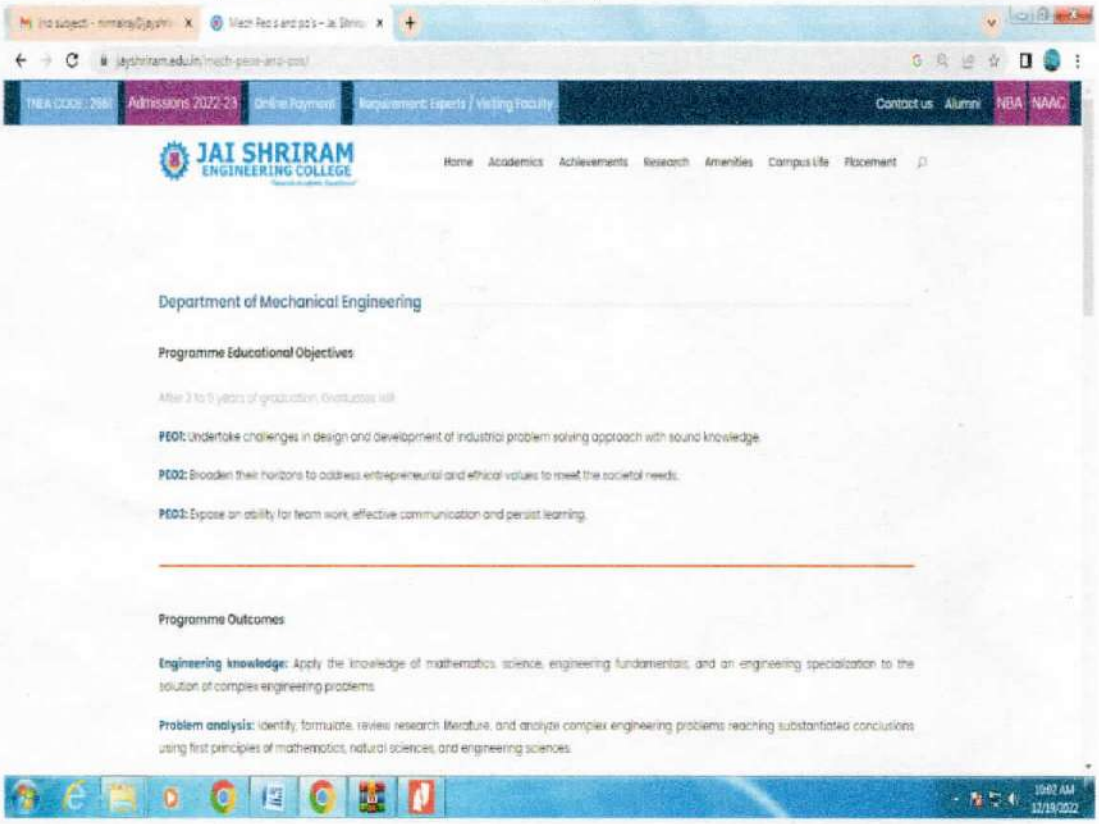


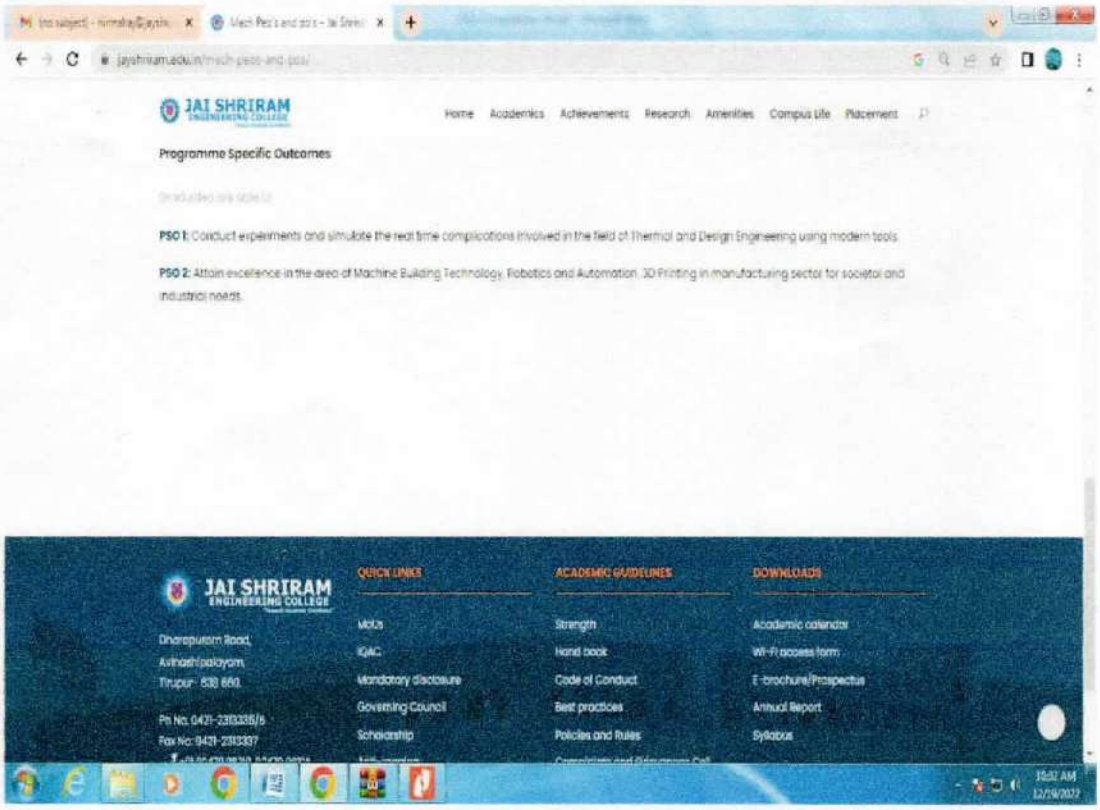


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**POs, PEOs, PSOs displayed at HoD Cabin**


**POs, PEOs, PSOs and CO's displayed at Classrooms**

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**POs, PEOs, PSOs displayed at Laboratories**

**POs, PEOs, PSOs displayed at Laboratories**

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# ANNA UNIVERSITY

# REGULATIONS – 2017

## DEPARTMENT OF CIVIL ENGINEERING
### Anna University Regulation 2017
### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS8151 | Communicative English |
| 2. | C102 | MA8151 | Engineering Mathematics - I |
| 3. | C103 | PH8151 | Engineering Physics |
| 4. | C104 | CY8151 | Engineering Chemistry |
| 5. | C105 | GE8151 | Problem Solving and Python Programming |
| 6. | C106 | GE8152 | Engineering Graphics |
| 7. | C107 | GE8161 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS8161 | Physics and Chemistry laboratory |
| 9. | C109 | HS8251 | Technical English |
| 10. | C110 | MA8251 | Engineering Mathematics - II |
| 11. | C111 | PH8201 | Physics for Civil Engineering |
| 12. | C112 | BE8251 | Basic Electrical and Electronics Engineering |
| 13. | C113 | GE8291 | Environmental Science and Engineering |
| 14. | C114 | GE8292 | Engineering Mechanics |
| 15. | C115 | BE8261 | Electric Circuits Laboratory |
| 16. | C116 | CE8211 | Computer Aided Building Drawing |
| 17. | C201 | MA8353 | Transforms and Partial Differential Equations |
| 18. | C202 | CE8301 | Strength of Materials I |
| 19. | C203 | CE8302 | Fluid Mechanics |
| 20. | C204 | CE8351 | Surveying |
| 21. | C205 | CE8391 | Construction Materials |
| 22. | C206 | CE8392 | Engineering Geology |
| 23. | C207 | CE8311 | Construction Materials Laboratory |
| 24. | C208 | CE8361 | Surveying Laboratory |
| 25. | C209 | HS8381 | Interpersonal Skills / Listening and Speaking |
| 26. | C210 | MA8491 | Numerical Methods |
| 27. | C211 | CE8401 | Construction Techniques and Practices |
| 28. | C212 | CE8402 | Strength of Materials II |
| 29. | C213 | CE8403 | Applied Hydraulic Engineering |
| 30. | C214 | CE8404 | Concrete Technology |
| 31. | C215 | CE8491 | Soil Mechanics |
| 32. | C216 | CE8481 | Strength of Materials Laboratory |
| 33. | C217 | CE8461 | Hydraulic Engineering Laboratory |

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| | | | |
|---|---|---|---|
| 34. | C218 | HS8461 | Advanced Reading and Writing |
| 35. | C301 | CE8501 | Design of Reinforced Cement Concrete Elements |
| 36. | C302 | CE8502 | Structural Analysis I |
| 37. | C303 | EN8491 | Water Supply Engineering |
| 38. | C304 | CE8591 | Foundation Engineering |
| 39. | C305 | GE8071 | Disaster Management |
| 40. | C306 | OAI551 | Environment and Agriculture |
| 41. | C307 | CE8511 | Soil Mechanics Laboratory |
| 42. | C308 | CE8512 | Water and Waste Water Analysis Laboratory |
| 43. | C309 | CE8513 | Survey Camp |
| 44. | C310 | CE8601 | Design of Steel Structural Elements |
| 45. | C311 | CE8602 | Structural Analysis II |
| 46. | C312 | CE8603 | Irrigation Engineering |
| 47. | C313 | CE8604 | Highway Engineering |
| 48. | C314 | EN8592 | Wastewater Engineering |
| 49. | C315 | CE8005 | Air Pollution and Control Engineering |
| 50. | C316 | CE8611 | Highway Engineering Laboratory |
| 51. | C317 | CE8612 | Irrigation and Environmental Engineering Drawing |
| 52. | C318 | HS8581 | Professional Communication |
| 53. | C401 | CE8701 | Estimation, Costing and Valuation Engineering |
| 54. | C402 | CE8702 | Railways, Airports, Docks and Harbour Engineering |
| 55. | C403 | CE8703 | Structural Design and Drawing |
| 56. | C404 | CE8012 | Construction Planning and Scheduling |
| 57. | C405 | OME754 | Industrial Safety |
| 58. | C406 | CE8711 | Creative and Innovative Project |
| 59. | C407 | CE8712 | Industrial Training |
| 60. | C408 | GE8076 | Professional Ethics in Engineering |
| 61. | C409 | CE8020 | Maintenance, Repair and Rehabilitation of Structures |
| 62. | C410 | CE8811 | Project Work |

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**Course Name: C101 (COMMUNICATIVE ENGLISH)**

**The students will be able to:**

| | |
|---|---|
| C101.1 | Explain the articles of a general kind in magazines and newspapers. |
| C101.2 | Understand the conversations and short talks delivered in English . |
| C101.3 | Complete the informal conversations effectively. |
| C101.4 | Write short essays of a general kind and personal letters and emails in English. |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 (ENGINEERING MATHEMATICS - I)**

**The students will be able to:**

| | |
|---|---|
| C102.1 | Calculate extreme values of a function. |
| C102.2 | Explain the differential calculus for multi variable functions. |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.4 | Estimate the area and volume using integrals. |
| C102.5 | Solve higher order linear Ordinary Differential Equations with constant and variable coefficients. |

**Course Name: C103 (ENGINEERING PHYSICS)**

**The students will be able to:**

| | |
|---|---|
| C103.1 | Gain knowledge on the basics of properties of matter and its applications. |
| C103.2 | Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics. |
| C103.3 | Relate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers. |
| C103.4 | An ability to identify, formulate and solve problems in quantum mechanics and its applications in tunnelling microscopes. |
| C103.5 | Interpret the basics of crystals, their structures and different crystal growth techniques. |

**Course Name: C104 (ENGINEERING CHEMISTRY)**

**The students will be able to:**

| | |
|---|---|
| C104.1 | Summarize the water related problems in boilers and their treatment techniques. |
| C104.2 | Understanding the basic concepts of surface chemistry and catalysis. |
| C104.3 | Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and the purpose and significance of alloys. |
| C104.4 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |
| C104.5 | Understand about principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills, super capacitors and fuel cells. |

**Course Name: C105 (PROBLEM SOLVING AND PYTHON PROGRAMMING)**

**The students will be able to:**

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems . |
| C105.2 | Understand basic commands of python and write simple Python programs. |
| C105.3 | Develop Python programs with conditional and loops and Decompose a Python program into functions. |

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| | |
|---|---|
| C105.4 | Represent compound data using Python lists, tuples, and dictionaries. |
| C105.5 | Read and write data from/to files in Python Programs. |

**Course Name: C106 (ENGINEERING GRAPHICS)**

**The students will be able to:**

| | |
|---|---|
| C106.1 | Familiarize with the fundamentals and standards of Engineering graphics . |
| C106.2 | Perform freehand sketching of basic geometrical constructions and multiple views of objects. |
| C106.3 | Project orthographic projections of lines and plane surfaces. |
| C106.4 | Draw projections and solids and development of surfaces. |
| C106.5 | Visualize and to project isometric and perspective sections of simple solids. |

**Course Name: C107 (PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 (PHYSICS AND CHEMISTRY LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course Name: C109 (TECHNICAL ENGLISH)**

**The students will be able to:**

| | |
|---|---|
| C109.1 | Focus their strategies and skills which enhance their ability to read and comprehend engineering and technology texts. |
| C109.2 | Analyze their ability to Speak appropriately and effectively in varied formal and informal contexts. |
| C109.3 | Prepare effective reports and winning job applications. |
| C109.4 | Make presentations and Participate in Group Discussions. |
| C109.5 | Show their communicative competence in writing and speaking. |

**Course Name: C110 (ENGINEERING MATHEMATICS - II)**

**The students will be able to:**

| | |
|---|---|
| C110.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C110.2 | Estimate the line, surface and volume integral by Green's, Stoke's and Gauss Divergence Theorem. |
| C110.3 | Classify the conformal mapping for different kinds of domain and Milne Thomson |

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| | |
|---|---|
| | method to find analytic functions. |
| C110.4 | Explain the contour integral with an integrand which has singularities in the closed region. |
| C110.5 | Apply the concept of Laplace Transform to the solution of linear Ordinary differential equations with constant coefficients. |

**Course Name: C111 (PHYSICS FOR CIVIL ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C111.1 | Ability to know and to understand the thermal performance of buildings. |
| C111.2 | Acquire knowledge on the acoustic properties of buildings. |
| C111.3 | Gain the knowledge on various lighting designs for buildings. |
| C111.4 | Interpret the properties and performance of engineering materials. |
| C111.5 | Understand the hazards of buildings. |

**Course Name: C112 (BASIC ELECTRICAL AND ELECTRONICS ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C112.1 | Explain the basic theorems used in Electrical circuits |
| C112.2 | Acquire Knowledge about the different components and function of electrical machines. |
| C112.3 | Explain the fundamentals of semiconductor and applications. |
| C112.4 | Explain the principles of digital electronics |
| C112.5 | Impart knowledge of communication. |

**Course Name: C113 (ENVIRONMENTAL SCIENCE AND ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C113.1 | Understand the interrelationship between living organism and environment.. |
| C113.2 | Know about the various causes, effect and control measures of environmental pollution. |
| C113.3 | Understand the importance of renewable and non- renewable resources. |
| C113.4 | Understand Social issues and the Environmental Management and Legislation Act. |
| C113.5 | Implementing scientific, technological, economic and political solutions to Environmental problems related to population |

**Course Name: C114 (ENGINEERING MECHANICS)**

**The students will be able to:**

| | |
|---|---|
| C114.1 | Llustrate the vectorial and scalar representation of forces and moments |
| C114.2 | Analyse forces and moments of rigid body system under equilibrium |
| C114.3 | Evaluate the properties of surfaces and solid |
| C114.4 | Explain the differential principles applies to solve engineering problem dealing with force, displacement, velocity and acceleration |
| C114.5 | Solve the elements of rigid body dynamics subjected to frictional forces and dynamic forces |

**Course Name: C115 (COMPUTER AIDED BUILDING DRAWING)**

**The students will be able to:**

| | |
|---|---|
| C115.1 | Understand the principles of planning |
| C115.2 | Draft the plan, section and elevation of buildings with load bearing walls |

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| | |
|---|---|
| C115.3 | Draft the plan, section and elevation of buildings with sloping roof |
| C115.4 | Draw the R.C.C framed structures building plan and section |
| C115.5 | Draw the industrial buildings- North roof light trusses |

**Course Name: C116 (ENGINEERING PRACTICES LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C116.1 | Fabricate carpentry components and pipe connections including plumbing works. |
| C116.2 | Use welding equipments to join the structures. |
| C116.3 | Carry out the basic machining operations |
| C116.4 | Make the models using sheet metal works |
| C116.5 | Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings. |

**Course Name: C201 (STRENGTH OF MATERIALS I)**

**The students will be able to:**

| | |
|---|---|
| C201.1 | Understand the concepts of stress and strain, principal stresses and principal planes. |
| C201.2 | Determine Shear force and bending moment in beams and understand concept of theory of simple bending. |
| C201.3 | Calculate the deflection of beams by different methods and selection of method for determining slope or deflection. |
| C201.4 | Apply basic equation of torsion in design of circular shafts and helical springs |
| C201.5 | Analyze the pin jointed plane and space trusses |

**Course Name: C202 (FLUID MECHANICS)**

**The students will be able to:**

| | |
|---|---|
| C202.1 | Get a basic knowledge of fluids in static, kinematic and dynamic equilibrium. |
| C202.2 | Understand and solve the problems related to equation of motion. |
| C202.3 | Make use of principles of dimensional analysis and similitude to simple models using dimensionless parameters |
| C202.4 | Understand Learn types of flow and losses of flow in pipes. |
| C202.5 | develop the concepts of viscous boundary layers and the momentum integral and use them to determine integral thicknesses, wall shear stresses, and skin friction coefficients. |

**Course Name: C203 (SURVEYING)**

**The students will be able to:**

| | |
|---|---|
| C203.1 | The use of various surveying instruments and mapping |
| C203.2 | Measuring Horizontal angle and vertical angle using different instruments |
| C203.3 | Methods of Leveling and setting Levels with different instruments |
| C203.4 | Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth |
| C203.5 | Concept and principle of modern surveying. |

**Course Name: C204 (CONSTRUCTION MATERIALS)**

**The students will be able to:**

| | |
|---|---|
| C204.1 | Compare the properties of most common and advanced building materials. |
| C204.2 | Understand the typical and potential applications of lime, cement and aggregates |
| C204.3 | Know the production of concrete and also the method of placing and making of |

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| | |
|---|---|
| | concrete elements. |
| C204.4 | Understand the applications of timbers and other materials |
| C204.5 | Understand the importance of modern material for construction. |

**Course Name: C205 (ENGINEERING GEOLOGY)**

**The students will be able to:**

| | |
|---|---|
| C205.1 | Able to understand the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies. |
| C205.2 | Get basics knowledge on properties of minerals. |
| C205.3 | Gain knowledge about types of rocks, their distribution and uses. |
| C205.4 | Understand the methods of study on geological structure. |
| C205.5 | Understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor |

**Course Name: C206 (TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS)**

**The students will be able to:**

| | |
|---|---|
| C206.1 | Understand how to solve the given standard partial differential equations. |
| C206.2 | Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. |
| C206.3 | Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations. |
| C206.4 | Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. |
| C206.5 | Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems. |

**Course Name: C207 (CONSTRUCTION MATERIALS LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C207.1 | Understand the testing of fine aggregates and coarse aggregates |
| C207.2 | Understand construction materials and components of construction elements experimentally |
| C207.3 | Knowledge about the properties of construction materials in construction field |
| C207.4 | Understand the testing of concrete and their properties |
| C207.5 | Understand the various properties and testing of bricks and blocks |

**Course Name: C208 (SURVEYING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C208.1 | Understand the concept of open traverse surveying and apply the same on the fields. |
| C208.2 | Undertake survey using tacheometer. |
| C208.3 | Determine the angles by Method of Reiteration and Repetition using Theodolite. |
| C208.4 | Do general field marking for various engineering projects and Location of site etc |
| C208.5 | Knowledge on Total Station and GPS and have adequate knowledge to carryout Triangulation and Astronomical surveying |

**Course Name: C209 (INTERPERSONAL SKILLS/LISTENING AND SPEAKING)**

**The students will be able to:**

| | |
|---|---|
| C209.1 | Listen and respond appropriately. |

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| | |
|---|---|
| C209.2 | Listen to a process information. |
| C209.3 | Participate in group discussions. |
| C209.4 | Make effective presentations. |
| C209.5 | Participate confidently and appropriately in conversations both formal and informal. |

**Course Name: C210 (NUMERICAL METHODS)**

**The students will be able to:**

| | |
|---|---|
| C210.1 | Understand the basic concepts and techniques of solving algebraic and transcendental equations. |
| C210.2 | Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations. |
| C210.3 | Apply the numerical techniques of differentiation and integration for engineering problems. |
| C210.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C210.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course Name: C211 (CONSTRUCTION TECHNIQUES AND PRACTICES)**

**The students will be able to:**

| | |
|---|---|
| C211.1 | Know the different construction techniques and structural systems |
| C211.2 | Understand various techniques and practices on masonry construction, flooring, and roofing. |
| C211.3 | Plan the requirements for substructure construction. |
| C211.4 | Know the methods and techniques involved in the construction of various types of super structures |
| C211.5 | Select, maintain and operate hand and power tools and equipment used in the building construction sites. |

**Course Name: C212 (STRENGTH OF MATERIALS II)**

**The students will be able to:**

| | |
|---|---|
| C212.1 | Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles |
| C212.2 | Analyze propped cantilever fixed beam sand continuous beams using theorem of three moment equation for external loadings and support settlements. |
| C212.3 | Find the load carrying capacity of columns and stresses induced in columns and cylinders |
| C212.4 | Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure |
| C212.5 | Determine the stresses due to unsymmetrical bending of beams, locate the shear center |

**Course Name: C213 (APPLIED HYDRAULIC ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C213.1 | Apply their knowledge of fluid mechanics in addressing problems in open channels. |

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| | |
|---|---|
| C213.2 | Identify a effective section for flow in different cross sections. |
| C213.3 | To solve problems in uniform, gradually and rapidly varied flows in steady state conditions. |
| C213.4 | Understand the principles, working and application of turbines. |
| C213.5 | Understand the principles, working and application of pumps. |

**Course Name: C214 (CONCRETE TECHNOLOGY)**

**The students will be able to:**

| | |
|---|---|
| C214.1 | The various requirements of cement, aggregates and water for making concrete |
| C214.2 | The effect of admixtures on properties of concrete |
| C214.3 | The concept and procedure of mix design as per IS method |
| C214.4 | The properties of concrete at fresh and hardened state |
| C214.5 | The importance and application of special concretes. |

**Course Name: C215 (SOIL MECHANICS)**

**The students will be able to:**

| | |
|---|---|
| C215.1 | Classify the soil and assess the engineering properties, based on index properties. |
| C215.2 | Understand the stress concepts in soils |
| C215.3 | Understand and identify the settlement in soils. |
| C215.4 | Determine the shear strength of soil |
| C215.5 | Analyze both finite and infinite slopes. |

**Course Name: C216 (STRENGTH OF MATERIALS LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C216.1 | Understand the properties of constructions materials |
| C216.2 | Understand the components of structural elements experimentally |
| C216.3 | Understand the testing of metal by impact and hardness test |
| C216.4 | Understand the deflection test on metal beam |
| C216.5 | Understand the compression and deflection test on spring |

**Course Name: C217 (HYDRAULIC ENGINEERING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C217.1 | Measure flow in pipes |
| C217.2 | Determine frictional losses |
| C217.3 | Develop characteristics of pumps |
| C217.4 | Develop characteristics of turbines.. |
| C217.5 | Determination of Metacentric height |

**Course Name: C218 (ADVANCED READING AND WRITING)**

**The students will be able to:**

| | |
|---|---|
| C218.1 | Write different types of essays |
| C218.2 | Write winning job applications |
| C218.3 | Read and evaluate texts critically |
| C218.4 | Display critical thinking in various professional contexts |
| C218.5 | Mail writing, job application, project writing convincing proposals |

**Course Name: C301 (DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS)**

**The students will be able to:**

| | |
|---|---|
| C301.1 | Understand the various design methodologies for the design of RC elements |

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| | |
|---|---|
| C301.2 | Know the analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion |
| C301.3 | Design the various types of slabs and staircase by limit state method |
| C301.4 | Design columns for axial, uniaxial and biaxial eccentric loadings |
| C301.5 | Design of footing by limit state method |

**Course Name: C302 (STRUCTURAL ANALYSIS I)**

**The students will be able to:**

| | |
|---|---|
| C302.1 | Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method |
| C302.2 | Analyse the continuous beams and rigid frames by slope defection method. |
| C302.3 | Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway |
| C302.4 | Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method |
| C302.5 | Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames |

**Course Name: C303 (WATER SUPPLY ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C303.1 | An insight into the structure of drinking water supply systems, including water transport, treatment and distribution |
| C303.2 | The knowledge in various unit operations and processes in water treatment |
| C303.3 | An ability to design the various functional units in water treatment |
| C303.4 | An understanding of water quality criteria and standards, and their relation to public health |
| C303.5 | The ability to design and evaluate water supply project alternatives on basis of chosen criteria. |

**Course Name: C304 (FOUNDATION ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C304.1 | Understand the site investigation, methods and sampling. |
| C304.2 | Get knowledge on bearing capacity and testing methods. |
| C304.3 | Design shallow footings. |
| C304.4 | Determine the load carrying capacity, settlement of pile foundation. |
| C304.5 | Determine the earth pressure on retaining walls and analysis for stability. |

**Course Name: C305 (DISASTER MANAGEMENT)**

**The students will be able to:**

| | |
|---|---|
| C305.1 | Differentiate the types of disasters, causes and their impact on environment and society |
| C305.2 | Assess vulnerability and various methods of risk reduction measures as well as mitigation. |
| C305.3 | Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management. |
| C305.4 | Gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR) |
| C305.5 | Develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity |

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**Course Name: C306 (ENVIRONMENT AND AGRICULTURE)**

**The students will be able to:**

| | |
|---|---|
| C306.1 | Understand the role of environment in the current practice of agriculture |
| C306.2 | Understand the various impacts of irrigation development and agriculture versus urban impacts |
| C306.3 | Concerns of sustainability, especially in the context of climate change |
| C306.4 | Understand the Ecological context of agriculture and its concerns |
| C306.5 | Emerging global issues |

**Course Name: C307 (SOIL MECHANICS LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C307.1 | Understand the test the soils for their index and engineering properties |
| C307.2 | Characterize the soil based on their properties |
| C307.3 | Understand the permeability and consolidation test |
| C307.4 | Understand the testing of unconfined compression, vane shear on soils |
| C307.5 | Understand the California bearing ratio test |

**Course Name: C308 (WATER AND WASTE WATER ANALYSIS LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C308.1 | Analyse the physical, chemical and biological characteristic soft water and waste water |
| C308.2 | Quantify the dosage requirement for coagulation process |
| C308.3 | Study the growth of micro-organism and its quantification |
| C308.4 | Quantify the sludge in waste water |
| C308.5 | Quantify the pollutant concentration in water and wastewater |

**Course Name: C309 (SURVEY CAMP)**

**The students will be able to:**

| | |
|---|---|
| C309.1 | Get practical training in the field work |
| C309.2 | Mapped and contoured the area |
| C309.3 | Understand the camp record original field observations, calculations and plots. |
| C309.4 | Determine azimuth |
| C309.5 | Traversing using GPS and curve setting by deflection angle |

**Course Name: C310 (DESIGN OF STEEL STRUCTURAL ELEMENTS)**

**The students will be able to:**

| | |
|---|---|
| C310.1 | Understand the concepts of various design philosophies |
| C310.2 | Design common bolted and welded connections for steel structures |
| C310.3 | Design tension members and understand the effect of shear lag |
| C310.4 | Understand the design concept of axially loaded columns and column base connections. |
| C310.5 | Understand specific problems related to the design of laterally restrained and unrestrained steel beams. |

**Course Name: C311 (STRUCTURAL ANALYSIS II)**

**The students will be able to:**

| | |
|---|---|
| C311.1 | Draw influence lines for statically determinate structures and calculate critical stress resultants. |

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| | |
|---|---|
| C311.2 | Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams. |
| C311.3 | Analyse of three hinged, two hinged and fixed arches. |
| C311.4 | Analyse the suspension bridges with stiffening girders |
| C311.5 | Understand the concept of Plastic analysis and the method of analyzing beams and rigid frames. |

**Course Name: C312 (IRRIGATION ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C312.1 | Have knowledge and skills on crop water requirements. |
| C312.2 | Understand the methods and management of irrigation. |
| C312.3 | Gain knowledge on types of Impounding structures |
| C312.4 | Understand methods of irrigation including canal irrigation. |
| C312.5 | Get knowledge on water management on optimization of water use. |

**Course Name: C313 (HIGHWAY ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C313.1 | Aligning of highway by Geometric design of highways |
| C313.2 | Design flexible and rigid pavements |
| C313.3 | Gain knowledge on Highway construction materials, properties, testing methods |
| C313.4 | Understand the concept of pavement management system |
| C313.5 | Evaluation of distress and maintenance of pavements |

**Course Name: C314 (WASTEWATER ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C314.1 | An ability to estimate sewage generation and design sewer system including sewage pumping stations |
| C314.2 | Understanding on the characteristics and composition of sewage, self-purification of streams |
| C314.3 | Perform basic design of the unit operations and processes that are used in sewage treatment |
| C314.4 | Understand the standard methods for disposal of sewage. |
| C314.5 | Gain knowledge on sludge treatment and disposal |

**Course Name: C315 (AIR POLLUTION AND CONTROL ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C315.1 | An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management |
| C315.2 | Identify, formulate and solve air and noise pollution problems |
| C315.3 | Design stacks and particulate air pollution control devices to meet applicable standards. |
| C315.4 | Select control equipment's. |
| C315.5 | Ensure quality, control and preventive measures. |

**Course Name: C316 (HIGHWAY ENGINEERING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C316.1 | Explain the properties of concrete and testing procedures |
| C316.2 | Measure the test values and compare the test results |

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| | |
|---|---|
| C316.3 | Ensure quality control while testing/sampling and acceptance criteria |
| C316.4 | Determine the properties of fresh and hardened concrete |
| C316.5 | Practice the usage of bitumen as pavement material in the highway engineering field |

**Course Name: C317(IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING)**

**The students will be able to:**

| | |
|---|---|
| C317.1 | Design tank surplus weir and also able to draw foundation details, planand elevation |
| C317.2 | Understand the design principles of impounding structures |
| C317.3 | Understand the design principles of cross drainage, canal regulation structures and able to draw the foundation details |
| C317.4 | Design and drawing the water supply & treatment structures |
| C317.5 | Design and drawing of sewage treatment & disposal |

**Course Name: C318(PROFESSIONAL COMMUNICATION)**

**The students will be able to:**

| | |
|---|---|
| C318.1 | Analyze their writing skills with specific reference to technical writing. |
| C318.2 | Discover more opportunities to develop their project and proposal writing skills. |
| C318.3 | Evaluate the texts critically. |
| C318.4 | Express their critical thinking in various professional contexts. |
| C318.5 | Prepare effective reports and winning job applications. |

**Course Name: C401(ESTIMATION, COSTING AND VALUATION ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C401.1 | Estimate the quantities for buildings |
| C401.2 | Rate Analysis for all Building works, canals, and Roads and Cost Estimate |
| C401.3 | Understand types of specifications, principles for report preparation, tender notices types |
| C401.4 | Gain knowledge on types of contracts |
| C401.5 | Evaluate valuation for building and land |

**Course Name: C402(RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C402.1 | Understand the methods of route alignment and design elements in Railway Planning and Constructions |
| C402.2 | Understand the Construction techniques and Maintenance of Track laying and Railway stations |
| C402.3 | Gain an insight on the planning and site selection of Airport Planning and design |
| C402.4 | Analyze and design the elements for orientation of runways and passenger facility systems |
| C402.5 | Understand the various features in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted |

**Course Name: C403(STRUCTURAL DESIGN AND DRAWING)**

**The students will be able to:**

| | |
|---|---|
| C403.1 | Design and draw reinforced concrete Cantilever and Counterfort Retaining Walls |

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| | |
|---|---|
| C403.2 | Design and draw flat slab as per code provisions |
| C403.3 | Design and draw reinforced concrete and steel bridges |
| C403.4 | Design and draw reinforced concrete and steel water tanks |
| C403.5 | Design and detail the various steel trusses and cantry girders |

**Course Name: C404 (CONSTRUCTION PLANNING AND SCHEDULING)**

**The students will be able to:**

| | |
|---|---|
| C404.1 | Understand basic concepts of construction planing. |
| C404.2 | Schedule the construction activities. |
| C404.3 | Forecast and control the cost in a construction. |
| C404.4 | Understand the quality control and safety during construction. |
| C404.5 | Organize information in Centralized database Management systems. |

**Course Name: C405 (INDUSTRIAL SAFETY)**

**The students will be able to:**

| | |
|---|---|
| C405.1 | Identify and prevent chemical hazard in industry |
| C405.2 | Analysis and apply proper safety techniques on safety engineering and management. |
| C405.3 | Understand the Industrial Health Hazards and Environmental Control |
| C405.4 | Analysis the Techniques and Fault Tree Analysis (FTA), Failure Modes and Effects Analysis (FMEA), HAZOP analysis and Risk Assessment |
| C405.5 | Understand the hazard control ,Safety education and product safety |

**Course Name: C406(CREATIVE AND INNOVATIVE PROJECT )**

**The students will be able to:**

| | |
|---|---|
| C406.1 | Knowledge acquired in Civil Engineering to do a mini project |
| C406.2 | Come up with designs, fabrication oralgorithms and programs expressing their ideas ina novel way. |
| C406.3 | Identify a topic of interest in consultation |
| C406.4 | Knowledge on different topics |
| C406.5 | Understand the teamwork |

**Course Name: C407 (INDUSTRIAL TRAINING)**

**The students will be able to:**

| | |
|---|---|
| C407.1 | Have a firsthand knowledge of practical problems in carrying out engineering tasks |
| C407.2 | Develop skills in facing and solving the field problems |
| C407.3 | Understand the intricacies of implementation text book knowledge into practice |
| C407.4 | Understand concepts of developments and implementation of new techniques |
| C407.5 | Understand how to create a report |

**Course Name: C408(PROFESSIONAL ETHICS IN ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C408.1 | Knowledge to apply ethics in society |
| C408.2 | Understand the engineering ethics |
| C408.3 | Discuss the ethical issues related to engineering |
| C408.4 | Understanding the responsibilities and rights in the society. |
| C408.5 | Understanding the global issues and corporate social responsibility |

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**Course Name: C409(MAINTENANCE, REPAIR AND REHABILITATION OF STRUCTURES)**

**The students will be able to:**

| | |
|---|---|
| C409.1 | The importance of maintenance and assessment method of distressed structures. |
| C409.2 | The strength and durability properties, their effects due to climate and temperature. |
| C409.3 | Recent development in concrete |
| C409.4 | The techniques for repair rand protection methods |
| C409.5 | Repair, rehabilitation and retrofitting of structures and demolition methods. |

**Course Name: C410(PROJECT WORK)**

**The students will be able to:**

| | |
|---|---|
| C410.1 | Position to take up any challenging practical problems and find solution by formulating proper methodology |
| C410.2 | Develop the ability to solve a specific problem right from its identification |
| C410.3 | Develop literature review till the successful solution of the same |
| C410.4 | Train the students in preparing project reports |
| C410.5 | Face reviews and viva voce examination |

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## DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
**Anna University Regulation 2017**
**List of course names**

| S.No | Course code | Subject Code | Course Name |
|---|---|---|---|
| 1. | C101 | HS8151 | Communicative English |
| 2. | C102 | MA8151 | Engineering Mathematics - I |
| 3. | C103 | PH8151 | Engineering Physics |
| 4. | C104 | CY8151 | Engineering Chemistry |
| 5. | C105 | GE8151 | Problem Solving and Python Programming |
| 6. | C106 | GE8152 | Engineering Graphics |
| 7. | C107 | GE8161 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS8161 | Physics and Chemistry Laboratory |
| 9. | C109 | HS8251 | Technical English |
| 10. | C110 | MA8251 | Engineering Mathematics II |
| 11. | C111 | PH8252 | Physics for Information Science |
| 12. | C112 | BE8255 | Basic Electrical Electronics and Measurement Engineering |
| 13. | C113 | GE8291 | Environmental Science and Engineering |
| 14. | C114 | CS8251 | Programming in C |
| 15. | C115 | GE8261 | Engineering Practices Laboratory |
| 16. | C116 | CS8261 | C Programming Laboratory |
| 17. | C201 | MA8351 | Discrete Mathematics |
| 18. | C202 | CS8351 | Digital Principles and Design |
| 19. | C203 | CS8391 | Data Structures |
| 20. | C204 | CS8392 | Object Oriented Programming |
| 21. | C205 | EC8395 | Communication Engineering |
| 22. | C206 | CS8381 | Data Structure Laboratory |
| 23. | C207 | CS8383 | Object Oriented Programming Laboratory |
| 24. | C208 | CS8382 | Digital Systems Laboratory |
| 25. | C209 | HS8381 | Interpersonal Skills/Listening & Speaking |
| 26. | C210 | MA8402 | Probability and Queuing Theory |
| 27. | C211 | CS8491 | Computer Architecture |
| 28. | C212 | CS8492 | Database Management Systems |
| 29. | C213 | CS8451 | Design and Analysis of Algorithms |
| 30. | C214 | CS8493 | Operating Systems |
| 31. | C215 | CS8494 | Software Engineering |
| 32. | C216 | CS8481 | Database Management Systems Laboratory |
| 33. | C217 | CS8461 | Operating Systems Laboratory |
| 34. | C218 | HS8461 | Advanced Reading and Writing |

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| | | | |
|---|---|---|---|
| 35. | C301 | MA8551 | Algebra and Number Theory |
| 36. | C302 | CS8591 | Computer Networks |
| 37. | C303 | EC8691 | Microprocessors and Microcontrollers |
| 38. | C304 | CS8501 | Theory of Computation |
| 39. | C305 | CS8592 | Object Oriented Analysis and Design |
| 40. | C306 | OCE551 | Air Pollution and Control Engineering |
| 41. | C307 | EC8681 | Microprocessors and Microcontrollers Laboratory |
| 42. | C308 | CS8582 | Object Oriented Analysis and Design Laboratory |
| 43. | C309 | CS8581 | Networks Laboratory |
| 44. | C310 | CS8651 | Internet Programming |
| 45. | C311 | CS8691 | Artificial Intelligence |
| 46. | C312 | CS8601 | Mobile Computing |
| 47. | C313 | CS8602 | Compiler Design |
| 48. | C314 | CS8603 | Distributed Systems |
| 49. | C315 | IT8076 | Software Testing |
| 50. | C316 | CS8661 | Internet Programming Laboratory |
| 51. | C317 | CS8662 | Mobile Application Development Laboratory |
| 52. | C318 | CS8611 | Mini Project |
| 53. | C319 | HS8581 | Professional Communication |
| 54. | C401 | MG8591 | Principles of Management |
| 55. | C402 | CS8792 | Cryptography and Network Security |
| 56. | C403 | CS8791 | Cloud Computing |
| 57. | C404 | OCE751 | Environmental Social Impact Assessment |
| 58. | C405 | IT8761 | Security Laboratory |
| 59. | C406 | CS8711 | Cloud Computing Laboratory |
| 60. | C407 | CS8079 | Human Computer Interaction |
| 61. | C408 | IT8074 | Service Oriented Architecture |
| 62. | C409 | GE8076 | Professional Ethics in Engineering |
| 63. | C410 | CS8078 | Green Computing |
| 64. | C411 | CS8811 | Project Work |

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**Course Name: C101 (COMMUNICATIVE ENGLISH)**

**The students will be able to**

| | |
|---|---|
| C101.1 | Explain the articles of a general kind in magazines and newspapers. |
| C101.2 | Understand the conversations and short talks delivered in English. |
| C101.3 | Complete the informal conversations effectively. |
| C101.4 | Write short essays of a general kind and personal letters and emails in English. |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 (ENGINEERING MATHEMATICS I)**

**The students will be able to**

| | |
|---|---|
| C102.1 | Calculate extreme values of a function |
| C102.2 | Explain the differential calculus for multi variable functions. |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.4 | Estimate the area and volume using integrals. |
| C102.5 | Solve higher order linear Ordinary Differential Equations with constant and variable coefficients. |

**Course Name: C103 (ENGINEERING PHYSICS)**

**The students will be able to**

| | |
|---|---|
| C103.1 | Gain knowledge on the basics of properties of matter and its applications |
| C103.2 | Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics |
| C103.3 | Relate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers |
| C103.4 | An ability to identify, formulate and solve problems in quantum mechanics and its applications in tunneling microscopes |
| C103.5 | Interpret the basics of crystals, their structures and different crystal growth techniques |

**Course Name: C104 (ENGINEERING CHEMISTRY)**

**The students will be able to**

| | |
|---|---|
| C104.1 | Water technique will felicitate better understanding of engineering process and application of further learning |
| C104.2 | Understanding the basic concepts of surface chemistry and catalysis. |
| C104.3 | Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and the purpose and significance of alloys. |
| C104.4 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |
| C104.5 | Understand about principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills, super capacitors and fuel cells. |

**Course Name: C105 (PROBLEM SOLVING AND PYTHON PROGRAMMING)**

**The students will be able to**

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems |
| C105.2 | Understand basic commands of python and write simple Python programs. |
| C105.3 | Develop Python programs with conditional and loops and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, and dictionaries. |
| C105.5 | Read and write data from/to files in Python Programs |

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**Course Name: C106 (ENGINEERING GRAPHICS)**

**The students will be able to**

| | |
|---|---|
| C106.1 | Perform free hand sketching of basic geometrical constructions and multiple views of objects. |
| C106.2 | Do orthographic projection of lines and plane surfaces. |
| C106.3 | Draw projections and solids and development of surfaces. |
| C106.4 | Prepare isometric and perspective sections of simple solids. |
| C106.5 | Understand computer aided drafting. |

**Course Name: C107 (PROBLEM SOLVING AND PYTHON PROGRAMMING LAB)**

**The students will be able to**

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 (PHYSICS AND CHEMISTRY LAB)**

**The students will be able to**

| | |
|---|---|
| C108.1 | Plan the experimental procedure, record and interpret the results. |
| C108.2 | The hands on exercises to apply physics principles to evaluate engineering and optical properties of materials. |
| C108.3 | Analyze the method of determining thickness of the given object. |
| C108.4 | Examine the acoustic properties of material using ultrasound waves. |
| C108.5 | Understanding the elastic nature of given materials. |

**Course Name: C109 (TECHNICAL ENGLISH)**

**The students will be able to**

| | |
|---|---|
| C109.1 | Utilize basic grammatical skills in writing. |
| C109.2 | Apply acquired knowledge of Grammar to prepare reviews, summaries and reports. |
| C109.3 | Integrate the reading skills by familiarizing with different types of reading strategies. |
| C109.4 | C Create documents with respect to career. |
| C109.5 | Make use of communicative English in real life situations. |

**Course Name: C110 (ENGINEERING MATHEMATICS II)**

**The students will be able to**

| | |
|---|---|
| C110.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C110.2 | Estimate the line, surface and volume integral by Green's, Stoke's and Gauss Divergence Theorem. |
| C110.3 | Classify the conformal mapping for different kinds of domain and Milne Thomson method to find analytic functions. |
| C110.4 | Explain the contour integral with an integrand which has singularities in the closed region. |
| C110.5 | Apply the concept of Laplace Transform to the solution of linear Ordinary differential equations with constant coefficients. |

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**Course Name: C111 (PHYSICS FOR INFORMATION SCIENCE)**

**The students will be able to**

| | |
|---|---|
| C111.1 | Gain knowledge on classical and quantum electron theories, and energy band structures |
| C111.2 | Interpret the basics of semiconductor physics and its applications in various devices related with engineering applications |
| C111.3 | Recognize the basic concepts of magnetic properties of materials and their applications in data storages |
| C111.4 | Ability to know and to understand the functioning of optical materials for optoelectronics. |
| C111.5 | Apply the techniques to manufacturing of quantum structures and their applications in carbon electronics especially on nano electronic devices |

**Course Name: C113 (ENVIRONMENTAL SCIENCE AND ENGINEERING)**

**The students will be able to**

| | |
|---|---|
| C113.1 | The students knowledgeable about with boiler feed water requirements, related problems and water treatment techniques. |
| C113.2 | Principles of electrochemical reactions, redox reactions in corrosion of materials and methods for corrosion prevention and protection of materials. |
| C113.3 | Understand about principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells. |
| C113.4 | Preparation, properties and applications of engineering materials |
| C113.5 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |

**Course Name: C114 (PROGRAMMING IN C)**

**The students will be able to**

| | |
|---|---|
| C114.1 | Understand the need for logical analysis and thinking. |
| C114.2 | Understand and apply c programming basics. |
| C114.3 | Learn to use C programs using arrays and strings. |
| C114.4 | Learn to use C programs using functions and pointers. |
| C114.5 | Write C programs using structures and unions. |

**Course Name: C112 (BASIC ELECTRICAL ELECTRONICS AND MECHANICAL ENGINEERING)**

**The students will be able to**

| | |
|---|---|
| C112.1 | Discuss the essentials of electric circuits and analysis. |
| C112.2 | Discuss the basic operation of electric machines and transformers |
| C112.3 | Introduction of renewable sources and common domestic loads. |
| C112.4 | Discuss the essentials of electronic circuits and analysis. |
| C112.5 | Introduction to measurement and metering for electric circuits |

**Course Name: C115 (ENGINEERING PRACTICES LAB)**

**The students will be able to**

| | |
|---|---|
| C115.1 | Understand and fabricate carpentry components. |
| C115.2 | Do pipe connections including plumbing works. |
| C115.3 | Understand and use welding equipments to join the structures. |
| C115.4 | Understand and fabricate electrical circuits. |
| C115.5 | Understand and fabricate electronics circuits. |

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**Course Name: C116 (C PROGRAMMING LAB)**
**The students will be able to**

| | |
|---|---|
| C116.1 | Develop simple applications in C using basic constructs. |
| C116.2 | Design and implement applications using arrays and strings. |
| C116.3 | Develop and implement applications in C using functions and pointers. |
| C116.4 | Develop applications in C using structures. |
| C116.5 | Design applications using sequential and random access file processing. |

**Course Name: C201 (DISCRETE MATHEMATICS)**
**The students will be able to**

| | |
|---|---|
| C201.1 | Describe the Rule of inference |
| C201.2 | Solving recurrence relation by generating function |
| C201.3 | Interpret matrix representation of graphs and graph isomorphism |
| C201.4 | Explain about group |
| C201.5 | Explain lattices as a algebraic system and Boolean algebra |

**Course Name: C202 (DIGITAL PRINCIPLES AND SYSTEM DESIGN)**
**The students will be able to**

| | |
|---|---|
| C202.1 | Simplify Boolean functions using KMap |
| C202.2 | Design and Analyze Combinational |
| C202.3 | Design and Analyze Synchronous Sequential Circuits |
| C202.4 | Design and Analyze Asynchronous Sequential Circuit |
| C202.5 | Implement designs using Programmable Logic Devices |

**Course Name: C203 (DATA STRUCTURES)**
**The students will be able to**

| | |
|---|---|
| C203.1 | Understand the concepts of ADTs |
| C203.2 | Learn linear data structures – lists, stacks, and queues |
| C203.3 | Apply the non-linear tree data structures to problem solutions. |
| C203.4 | Apply the non-linear graphs data structures to problem solutions. |
| C203.5 | Critically analyze the various sorting algorithms. |

**Course Name: C204 (OBJECT ORINETED PROGRAMMING)**
**The students will be able to**

| | |
|---|---|
| C204.1 | Develop Java programs using OOP principles |
| C204.2 | Develop Java programs with the concepts inheritance and interfaces |
| C204.3 | Build Java applications using exceptions and I/O streams |
| C204.4 | Develop Java applications with threads and generics classes |
| C204.5 | Develop interactive Java programs using swings |

**Course Name: C205 (COMMUNICATION ENGINEERING)**
**The students will be able to**

| | |
|---|---|
| C205.1 | Apply analog communication techniques. |
| C205.2 | Use data and pulse communication techniques. |
| C205.3 | Apply analog and digital communication techniques.. |
| C205.4 | Understand the principles behind information theory and coding |
| C205.5 | Understand the various digital communication techniques |

**Course Name: C206 (DATA STRUCTURES LAB)**
**The students will be able to**

| | |
|---|---|
| C206.1 | Write functions to implement linear data structure operations |
| C206.2 | Write functions to implement non-linear data structure operations |

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| | |
|---|---|
| C206.3 | Suggest appropriate linear / non-linear data structure operations for solving a given problem |
| C206.4 | Appropriately use the linear / non-linear data structure operations for a given problem |
| C206.5 | Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval |

**Course Name: C207 (OBJECT ORIENTED PROGRAMMING LAB)**

**The students will be able to**

| | |
|---|---|
| C207.1 | Develop and implement Java programs for simple applications that make use of classes, packages and interfaces. |
| C207.2 | Develop and implement Java programs with arraylist |
| C207.3 | Develop and implement Java programs with exception handling and multithreading |
| C207.4 | Design applications using file processing, generic programming |
| C207.5 | Design applications using event handling. |

**Course Name: C208 (DIGITAL SYSTEMS LAB)**

**The students will be able to**

| | |
|---|---|
| C208.1 | Understand and use basic logic gates |
| C208.2 | Implement simplified combinational circuits |
| C208.3 | Implement combinational circuits using MSI devices |
| C208.4 | Implement sequential circuits like registers and counters |
| C208.5 | Simulate combinational and sequential circuits using HDL |

**Course Name: C209 (INTERPERSONAL SKILLS/LISTENING&SPEAKING)**

**The students will be able to**

| | |
|---|---|
| C209.1 | Show their communicative competence with specific reference to speaking and listening. |
| C209.2 | Analyze their ability to communicate effectively and successfully answer questions in interviews. |
| C209.3 | Make presentations and Participate in Group Discussions |
| C209.4 | Focus their prospects of success in competitive examinations |
| C209.5 | Prepare the students in soft skills, interpersonal skills. |

**Course Name: C210 PROBABILITY AND QUEUING THEORY**

**The students will be able to**

| | |
|---|---|
| C210.1 | Interpret standard statistics from mass, distribution and density functions |
| C210.2 | Explain the concepts of correlation functions and linear regressions |
| C210.3 | Classify random processes such as stationary, wide-sense stationary and ergodicity |
| C210.4 | Illustrate the single and multiple server queues |
| C210.5 | Explain open Jackson and closed Jackson onwards |

**Course Name: C211 (COMPUTER ARCHITECTURE)**

**The students will be able to**

| | |
|---|---|
| C211.1 | Understand the basics structure of computers, operations and instructions. |
| C211.2 | Understand arithmetic and logic unit. |
| C211.3 | Understand pipelined execution and design control unit. |
| C211.4 | Understand parallel processing architectures. |
| C211.5 | Understand the various memory systems and I/O communication. |

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**Course Name: C212 (DATABASE MANAGEMENT SYSTEMS)**

**The students will be able to**

| | |
|---|---|
| C212.1 | Classify the modern and futuristic database applications based on size and complexity |
| C212.2 | Map ER model to Relational model to perform database design effectively and understand the concepts of normalization |
| C212.3 | Understand the fundamental concepts of transaction processing- concurrency |
| C212.4 | Compare and contrast various indexing strategies in different database systems |
| C212.5 | Appraise how advanced databases differ from traditional databases. |

**Course Name: C213 (DESIGN AND ANALYSIS OF ALGORITHMS)**

**The students will be able to**

| | |
|---|---|
| C213.1 | Design algorithms for various computing problems and analyze the time and space complexity of algorithms. |
| C213.2 | Analyze and apply brute force and divide & conquer techniques. |
| C213.3 | Understand and apply dynamic programming and greedy technique for a given problem. |
| C213.4 | Analyze and apply the iterative improvement technique for a given problem. |
| C213.5 | Understand the limitations of algorithmic power. |

**Course Name: C214 (OPERATING SYSTEMS)**

**The students will be able to**

| | |
|---|---|
| C214.1 | Analyze various scheduling algorithms |
| C214.2 | Understand deadlock, prevention and avoidance algorithms. |
| C214.3 | Compare and contrast various memory management schemes |
| C214.4 | Understand the functionality of file systems. |
| C214.5 | Perform administrative tasks on Linux Servers and Compare iOS and Android Operating Systems. |

**Course Name: C215 (SOFTWARE ENGINEERING)**

**The students will be able to**

| | |
|---|---|
| C215.1 | Identify the key activities in managing software project and compare different process models. |
| C215.2 | Understand the concepts of requirements engineering and Analysis Modeling |
| C215.3 | Apply systematic procedure for software design and deployment. |
| C215.4 | Compare and contrast the various testing and maintenance. |
| C215.5 | Manage project schedule, estimate project cost and effort required. |

**Course Name: C216 (DATABASE MANAGEMENT SYSTEMS LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C216.1 | Use typical data definitions and manipulation commands |
| C216.2 | Design applications to test Nested and Join Queries |
| C216.3 | Implement simple applications that use Views |
| C216.4 | Implement applications that require a Front-end Tool |
| C216.5 | Critically analyze the use of Tables, Views, Functions and Procedures |

**Course Name: C217 (OPERATING SYSTEMS LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C217.1 | Compare the performance of various CPU Scheduling Algorithms |

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| | |
|---|---|
| C217.2 | Implement Deadlock avoidance and Detection Algorithms and Semaphores |
| C217.3 | Create processes and implement IPC |
| C217.4 | Analyze the performance of the various Page Replacement Algorithms |
| C217.5 | Implement File Organization and File Allocation Strategies |

**Course Name: C218 (ADVANCED READING AND WRITING)**

**The students will be able to**

| | |
|---|---|
| C218.1 | Analyze their writing skills with specific reference to technical writing. |
| C218.2 | Discover more opportunities to develop their project and proposal writing skills. |
| C218.3 | Evaluate the texts critically. |
| C218.4 | Express their critical thinking in various professional contexts. |
| C218.5 | Prepare effective reports and winning job applications. |

**Course Name: CS301 (ALGEBRA AND NUMBER THEORY)**

**The students will be able to**

| | |
|---|---|
| C301.1 | Explain the basic notions of groups, rings, fields which will then be used to solve related problems. |
| C301.2 | Apply the concepts of rings, finite fields and polynomials |
| C301.3 | Explain the division algorithm and Euclidean algorithm. |
| C301.4 | Solve Diophantine equations and congruence. |
| C301.5 | Apply Fermat's little theorem and Euler's theorem |

**Course Name: C302 (COMPUTERNETWORKS)**

**The students will be able to**

| | |
|---|---|
| C302.1 | Understand the basic layers and its functions in computer networks & Evaluate the performance of a network. |
| C302.2 | Understand the basics of how data flows from one node to another. |
| C302.3 | Analyze and design routing algorithms. |
| C302.4 | Design protocols for various functions in the network. |
| C302.5 | Understand the working of various application layer protocols. |

**Course Name: C303 (MICROPROCESSORS AND MICROCONTROLLERS)**

**The students will be able to**

| | |
|---|---|
| C303. 1 | Understand the fundamentals of 8086 microprocessor. |
| C303.2 | Understand and execute programs based on 8086 microprocessor. |
| C303.3 | Design Memory Interfacing circuits. |
| C303.4 | Design and interface I/O circuits. |
| C303.5 | Design and implement 8051 microcontroller based systems. |

**Course Name: C304 (THEORY OF COMPUTATION)**

**The students will be able to**

| | |
|---|---|
| C304.1 | Construct automata, regular expression for any pattern. |
| C304.2 | Write Context free grammar for any construct. |
| C304.3 | Design Turing machines for any language. |
| C304.4 | Propose computation solutions using Turing machines. |
| C304.5 | Derive whether a problem is decidable or not. |

**Course Name: C305 (OBJECT ORIENTED ANALYSIS AND DESIGN)**

**The students will be able to**

| | |
|---|---|
| C305.1 | Design software applications using OO concepts. |

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| | |
|---|---|
| C305.2 | Design static UML diagrams. |
| C305.3 | Design dynamic UML diagrams. |
| C305.4 | Transform UML based software design into pattern based design using design patterns. |
| C305.5 | Explain the various testing methodologies for OO software. |

**Course Name: C307 (MICROPROCESSORS AND MICROCONTROLLERS LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C307.1 | Write ALP Programmes for fixed and Floating Point and Arithmetic operations |
| C307.2 | Interface different I/Os with processor |
| C307.3 | Generate waveforms using Microprocessors |
| C307.4 | Execute Programs in 8051 |
| C307.5 | Explain the difference between simulator and Emulator |

**Course Name: C308 (OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C308.1 | Perform OO analysis and design for a given problem specification |
| C308.2 | Identify and map basic software requirements in UML mapping. |
| C308.3 | Improve the software quality using design patterns |
| C308.4 | Explain the rationale behind applying specific design patterns |
| C308.5 | Test the compliance of the software with the SRS |

**Course Name: C309 (NETWORKS LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C309.1 | Implement various protocols using TCP and UDP. |
| C309.2 | Compare the performance of different transport layer protocols. |
| C309.3 | Use simulation tools to analyze the performance of various network protocols. |
| C309.4 | Analyze various routing algorithms |
| C309.5 | Implement error correction codes |

**Course Name: C310 (INTERNET PROGRAMMING)**

**The students will be able to**

| | |
|---|---|
| C310.1 | Construct a basic website using HTML and Cascading Style Sheets. |
| C310.2 | Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms. |
| C310.3 | Develop server side programs using Servlets and JSP. |
| C310.4 | Construct simple web pages in PHP and to represent data in XML format. |
| C310.5 | Use AJAX and web services to develop interactive web applications |

**Course Name: C311 (ARTIFICIAL INTELLIGENCE)**

**The students will be able to**

| | |
|---|---|
| C311.1 | Use appropriate search algorithms for any AI problem |
| C311.2 | Represent a problem using first order and predicate logic |
| C311.3 | Provide the apt agent strategy to solve a given problem |
| C311.4 | Design software agents to solve a problem |
| C311.5 | Design applications for NLP that use Artificial Intelligence. |

**Course Name: C312 (MOBILE COMPUTING)**

**The students will be able to**

| | |
|---|---|
| C312.1 | Explain the basics of mobile telecommunication systems |

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| | |
|---|---|
| C312.2 | Illustrate the generations of telecommunication systems in wireless networks |
| C312.3 | Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network |
| C312.4 | Explain the functionality of Transport and Application layers |
| C312.5 | Develop a mobile application using android/blackberry/ios/Windows SDK |

**Course Name: C313 (COMPILER DESIGN)**

**The students will be able to**

| | |
|---|---|
| C313.1 | Understand the different phases of compiler. |
| C313.2 | Design a lexical analyzer for a sample language |
| C313.3 | Apply different parsing algorithms to develop the parsers for a given grammar and Understand syntax-directed translation and run-time environment |
| C313.4 | Learn to implement code optimization techniques and a simple code generator. |
| C313.5 | Design and implement a scanner and a parser using LEX and YACC tools. |

**Course Name: C314 (DISTRIBUTED SYSTEMS)**

**The students will be able to**

| | |
|---|---|
| C314.1 | Elucidate the foundations and issues of distributed systems |
| C314.2 | Understand the various synchronization issues and global state for distributed systems. |
| C314.3 | Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems |
| C314.4 | Describe the agreement protocols and fault tolerance mechanisms in distributed systems |
| C314.5 | Describe the features of peer-to-peer and distributed shared memory systems |

**Course Name: C315 (SOFTWARE TESTING)**

**The students will be able to**

| | |
|---|---|
| C315.1 | Understand testing principles and defect identification and prevention strategies. |
| C315.2 | Design test cases suitable for a software development for different domains and Identify suitable tests to be carried out. |
| C315.3 | Prepare test planning based on the document. |
| C315.4 | Document test plans and test cases designed. |
| C315.5 | Use of automatic testing tools, develop and validate a test plan. |

**Course Name: C316 (INTERNET PROGRAMMING LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C316.1 | Construct Web pages using HTML/XML and style sheets. |
| C316.2 | Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms. |
| C316.3 | Develop dynamic web pages using server side scripting. |
| C316.4 | Use PHP programming to develop web applications. |
| C316.5 | Construct web applications using AJAX and web services. |

**Course Name: C317 (MOBILE APPLICATION DEVELOPMENT LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C317.1 | Develop mobile applications using GUI and Layouts. |
| C317.2 | Develop mobile applications using Event Listener. |
| C317.3 | Develop mobile applications using Databases |
| C317.4 | Develop mobile applications using RSS Feed, Internal/External Storage, SMS. |

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| | |
|---|---|
| | Multithreading and GPS. |
| C317.5 | Analyze and discover own mobile app for simple needs. |

**Course Name: C318 (MINI PROJECT)**
**The students will be able to**

| | |
|---|---|
| C318.1 | Analyze the literature and identify a challenging problem with a suitable approach to solve it. |
| C318.2 | Function as a team and contribute effectively towards planning and execution of the project work. |
| C318.3 | Choose efficient tools and apply technical knowledge and skills to achieve the identified objectives of the project work. |
| C318.4 | Design and develop a suitable hardware and/or software based solution for the identified problem. |
| C318.5 | Demonstrate the carried out work along with a project report and documentation |

**Course Name: C319 (PROFESSIONAL COMMUNICATION)**
**The students will be able to**

| | |
|---|---|
| C319.1 | Analyze their writing skills with specific reference to technical writing. |
| C319.2 | Discover more opportunities to develop their project and proposal writing skills. |
| C319.3 | Evaluate the texts critically. |
| C319.4 | Express their critical thinking in various professional contexts. |
| C319.5 | Prepare effective reports and winning job applications. |

**Course Name: C401 (PRINCIPLES OF MANAGEMENT)**
**The students will be able to**

| | |
|---|---|
| C401.1 | Understand the principles of management and organization. |
| C401.2 | Understand the managerial function Planning |
| C401.3 | Learn the organizing in management |
| C401.4 | Knowledge about Staffing and leading. |
| C401.5 | Understand the concepts in Controlling |

**Course Name: C402 (CRYPTOGRAPHY AND NETWORK SECURITY)**
**The students will be able to**

| | |
|---|---|
| C402.1 | Understand the fundamentals of networks security, security architecture, threats and vulnerabilities |
| C402.2 | Apply the different cryptographic operations of symmetric cryptographic algorithms |
| C402.3 | Apply the different cryptographic operations of public key cryptography |
| C402.4 | Apply the various Authentication schemes to simulate different applications. |
| C402.5 | Understand various Security practices and System security standards |

**Course Name: C403 (CLOUD COMPUTING)**
**The students will be able to**

| | |
|---|---|
| C403. 1 | Articulate the main concepts, key technologies, strengths and limitations of cloud computing and Learn the key and enabling technologies that help in the development of cloud. |
| C403.2 | Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models. |
| C403.3 | Explain the core issues of cloud computing such as resource management and security. |
| C403.4 | Be able to install and use current cloud technologies. |

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| | |
|---|---|
| C403.5 | Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud. |

**Course Name: C404 (SECURITY LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C404.1 | Develop code for classical Encryption Techniques to solve the problems. |
| C404.2 | Build cryptosystems by applying symmetric and public key encryption algorithms. |
| C404.3 | Construct code for authentication algorithms. |
| C404.4 | Develop a signature scheme using Digital signature standard. |
| C404.5 | Demonstrate the network security system using open source tools |

**Course Name: C405 (CLOUD COMPUTING LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C405.1 | Configure various virtualization tools such as Virtual Box, VMware workstation. |
| C405.2 | Design and deploy a web application in a PaaS environment. |
| C405.3 | Learn how to simulate a cloud environment to implement new schedulers. |
| C405.4 | Install and use a generic cloud environment that can be used as a private cloud. |
| C405.5 | Manipulate large data sets in a parallel environment. |

**Course Name: C406 (Human Computer Interaction)**

**The students will be able to**

| | |
|---|---|
| C406.1 | Configure various virtualization tools such as Virtual Box, VMware workstation. |
| C406.2 | Design and deploy a web application in a PaaS environment. |
| C406.3 | Learn how to simulate a cloud environment to implement new schedulers. |
| C406.4 | Install and use a generic cloud environment that can be used as a private cloud. |
| C406.5 | Manipulate large data sets in a parallel environment. |

**Course Name: C407 (Environmental Social Impact Assessment)**

**The students will be able to**

| | |
|---|---|
| C407.1 | Understand Environmental Impact Assessment |
| C407.2 | Carry out scoping and screening of developmental projects for environmental and social assessments |
| C407.3 | Explain different methodologies for environmental impact prediction and assessment |
| C407.4 | Plan environmental impact assessments and environmental management plans |
| C407.5 | Evaluate environmental impact assessment reports |

**Course Name: C408 (Service Oriented Architecture)**

**The students will be able to**

| | |
|---|---|
| C408.1 | Understand XML technologies |
| C408.2 | Understand service orientation, benefits of SOA |
| C408.3 | Understand web services and WS standards |
| C408.4 | Use web services extensions to develop solutions |
| C408.5 | Understand and apply service modeling, service oriented analysis and design for application development |

**Course Name: C409 (Professional Ethics in Engineering)**

**The students will be able to**

| | |
|---|---|
| C409.1 | Describe the human values with regard to the individual life style for the society |
| C409.2 | Explain the role of ethics to the engineering field |

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| | |
|---|---|
| C409.3 | Explain the engineering ethics based safety, responsibilities and rights |
| C409.4 | Discuss the global issues of professional ethics in engineering |
| C409.5 | Experiment the professional ethics in engineering based product development |

**Course Name: C410 (Green Computing)**

**The students will be able to**

| | |
|---|---|
| C410.1 | Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment. |
| C410.2 | Understand Green asset and modeling |
| C410.3 | Enhance the skill in energy saving practices in their use of hardware. |
| C410.4 | Evaluate technology tools that can reduce paper waste and carbon footprint by the stakeholders. |
| C410.5 | Understand the ways to minimize equipment disposal requirements. |

**Course Name: C411 (Project Work)**

**The students will be able to**

| | |
|---|---|
| C411.1 | Analyze the literature and identify a challenging problem with a suitable approach to solve it. |
| C411.2 | Function as a team and contribute effectively towards planning and execution of the project work. |
| C411.3 | Choose efficient tools and apply technical knowledge and skills to achieve the identified objectives of the project work. |
| C411.4 | Design and develop a suitable hardware and/or software based solution for the identified problem. |
| C411.5 | Demonstrate the carried out work along with a project report and documentation |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**Anna University Regulation 2017**

**List of course names**

| S.No | Course Code | Subject Code | Subject Name |
|---|---|---|---|
| 1. | C101 | HS8151 | Communicative English |
| 2. | C102 | MA8151 | Engineering Mathematics - I |
| 3. | C103 | PH8151 | Engineering Physics |
| 4. | C104 | CY8151 | Engineering Chemistry |
| 5. | C105 | GE8151 | Problem Solving and Python Programming |
| 6. | C106 | GE8152 | Engineering Graphics |
| 7. | C107 | GE8161 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS8161 | Physics and Chemistry Laboratory |
| 9. | C109 | HS8251 | Technical English |
| 10. | C110 | MA8251 | Engineering Mathematics - II |
| 11. | C111 | PH8253 | Physics for Electronics Engineering |
| 12. | C112 | BE8252 | Basic Civil and Mechanical Engineering |
| 13. | C113 | EE8251 | Circuit Theory |
| 14. | C114 | GE8291 | Environmental Science and Engineering |
| 15. | C115 | GE8261 | Engineering Practices Laboratory |
| 16. | C116 | EE8261 | Electric Circuits Laboratory |
| 17. | C201 | MA8353 | Transforms and Partial Differential Equations |
| 18. | C202 | EE8351 | Digital Logic Circuits |
| 19. | C203 | EE8391 | Electromagnetic Theory |
| 20. | C204 | EE8301 | Electrical Machines - I |
| 21. | C205 | EC8353 | Electron Devices and Circuits |
| 22. | C206 | ME8792 | Power Plant Engineering |
| 23. | C207 | EC8311 | Electronics Laboratory |
| 24. | C208 | EE8311 | Electrical Machines Laboratory - I |
| 25. | C209 | MA8491 | Numerical Methods |
| 26. | C210 | EE8401 | Electrical Machines - II |
| 27. | C211 | EE8402 | Transmission and Distribution |
| 28. | C212 | EE8403 | Measurements and Instrumentation |
| 29. | C213 | EE8451 | Linear Integrated Circuits and Applications |
| 30. | C214 | IC8451 | Control Systems |
| 31. | C215 | EE8411 | Electrical Machines Laboratory - II |
| 32. | C216 | EE8461 | Linear and Digital Integrated Circuits Laboratory |

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|---|---|---|---|
| 33. | C217 | EE8412 | Technical Seminar |
| 34. | C301 | EE8501 | Power System Analysis |
| 35. | C302 | EE8551 | Microprocessors and Microcontrollers |
| 36. | C303 | EE8552 | Power Electronics |
| 37. | C304 | EE8591 | Digital Signal Processing |
| 38. | C305 | CS8392 | Object Oriented Programming |
| 39. | C306 | OAN551 | Sensors and Transducers |
| 40. | C307 | EE8511 | Control and Instrumentation Laboratory |
| 41. | C308 | HS8581 | Professional Communication |
| 42. | C309 | CS8383 | Object Oriented Programming Laboratory |
| 43. | C310 | EE8601 | Solid State Drives |
| 44. | C311 | EE8602 | Protection and Switchgear |
| 45. | C312 | EE8691 | Embedded Systems |
| 46. | C313 | GE8075 | Intellectual Property Rights |
| 47. | C314 | EE8005 | Special Electrical Machines |
| 48. | C315 | EE8661 | Power Electronics and Drives Laboratory |
| 49. | C316 | EE8681 | Microprocessors and Microcontrollers Laboratory |
| 50. | C317 | EE8611 | Mini Project |
| 51. | C401 | EE8701 | High Voltage Engineering |
| 52. | C402 | EE8702 | Power System Operation and Control |
| 53. | C403 | EE8703 | Renewable Energy Systems |
| 54. | C404 | OML751 | Testing of Materials |
| 55. | C405 | GE8071 | Disaster Management |
| 56. | C406 | EE8010 | Power System Transients |
| 57. | C407 | EE8711 | Power System Simulation Laboratory |
| 58. | C408 | EE8712 | Renewable Energy Systems Laboratory |
| 59. | C409 | MG8591 | Principles of Management |
| 60. | C410 | EE8017 | High Voltage Direct Current Transmission |
| 61. | C411 | EE8811 | Project Work |

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**Course Name: C101 COMMUNICATIVE ENGLISH**

Students will be able to

| | |
|---|---|
| C101.1 | Explain the articles of a general kind in magazines and newspapers. |
| C101.2 | Understand the conversations and short talks delivered in English . |
| C101.3 | Complete the informal conversations effectively. |
| C101.4 | Write short essays of a general kind and personal letters and emails in English. |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 ENGINEERING MATHEMATICS - I**

Students will be able to

| | |
|---|---|
| C102.1 | Calculate extreme values of a function. |
| C102.2 | Explain the differential calculus for multi variable functions. |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.4 | Estimate the area and volume using integrals. |
| C102.5 | Solve higher order linear Ordinary Differential Equations with constant and variable coefficients. |

**Course Name: C103 ENGINEERING PHYSICS**

Students will be able to

| | |
|---|---|
| C103.1 | Gain knowledge on the basics of properties of matter and its applications. |
| C103.2 | Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics. |
| C103.3 | Relate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers. |
| C103.4 | An ability to identify, formulate and solve problems in quantum mechanics and its applications in tunnelling microscopes. |
| C103.5 | Interpret the basics of crystals, their structures and different crystal growth techniques. |

**Course Name: C104 ENGINEERING CHEMISTRY**

Students will be able to

| | |
|---|---|
| C104.1 | Summarize the water related problems in boilers and their treatment techniques. |
| C104.2 | Understanding the basic concepts of surface chemistry and catalysis. |
| C104.3 | Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and the purpose and significance of alloys. |
| C104.4 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |
| C104.5 | Understand about principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills, super capacitors and fuel cells. |

**Course Name: C105 PROBLEM SOLVING AND PYTHON PROGRAMMING**

Students will be able to

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems . |
| C105.2 | Understand basic commands of python and write simple Python programs. |
| C105.3 | Develop Python programs with conditional and loops and Decompose a Python |

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| | |
|---|---|
| | program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, and dictionaries. |
| C105.5 | Read and write data from/to files in Python Programs. |

**Course Name: C106 ENGINEERING GRAPHICS**

Students will be able to

| | |
|---|---|
| C106.1 | Familiarize with the fundamentals and standards of Engineering graphics . |
| C106.2 | Perform freehand sketching of basic geometrical constructions and multiple views of objects. |
| C106.3 | Project orthographic projections of lines and plane surfaces. |
| C106.4 | Draw projections and solids and development of surfaces. |
| C106.5 | Visualize and to project isometric and perspective sections of simple solids. |

**Course Name: C107 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY**

Students will be able to

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 PHYSICS AND CHEMISTRY LABORATORY**

Students will be able to

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipments |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaoratively |

**Course Name: C109 TECHNICAL ENGLISH**

Students will be able to

| | |
|---|---|
| C109.1 | Focus their strategies and skills which enhance their ability to read and comprehend engineering and technology texts. |
| C109.2 | Analyze their ability to Speak appropriately and effectively in varied formal and informal contexts. |
| C109.3 | Prepare effective reports and winning job applications. |
| C109.4 | Make presentations and Participate in Group Discussions. |
| C109.5 | Show their communicative competence in writing and speaking. |

**Course Name: C110 ENGINEERING MATHEMATICS - II**

Students will be able to

| | |
|---|---|
| C110.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C110.2 | Estimate the line, surface and volume integral by Green's, Stoke's and Gauss Divergence Theorem. |

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| | |
|---|---|
| C110.3 | Classify the conformal mapping for different kinds of domain and Milne Thomson method to find analytic functions. |
| C110.4 | Explain the contour integral with an integrand which has singularities in the closed region. |
| C110.5 | Apply the concept of Laplace Transform to the solution of linear Ordinary differential equations with constant coefficients. |

**Course Name: C111 PHYSICS FOR ELECTRONICS ENGINEERING**

Students will be able to

| | |
|---|---|
| C111.1 | Gain knowledge on classical and quantum electron theories, and energy band structures. |
| C111.2 | Interpret the basics of semiconductor physics and its applications in various devices related with engineering applications. |
| C111.3 | Recognize the basic concepts of magnetic and dielectric properties of materials and their applications in data storages. |
| C111.4 | Ability to know and to understand the functioning of optical materials for optoelectronics. |
| C111.5 | Apply the techniques to manufacturing of quantum structures and their applications in carbon electronics especially spintronics on nano electronic devices. |

**Course Name: C112 BASIC CIVIL AND MECHANICAL ENGINEERING**

Students will be able to

| | |
|---|---|
| C112.1 | Impart basic knowledge on Civil and Mechanical Engineering. |
| C112.2 | Familiarize the materials and measurements used in Civil Engineering. |
| C112.3 | Provide the exposure on the fundamental elements of civil engineering structures. |
| C112.4 | Identify the components and working principle of power plant units & IC engines. |
| C112.5 | Elaborate the components of refrigeration and Air conditioning cycle |

**Course Name: C113 CIRCUIT THEORY**

Students will be able to

| | |
|---|---|
| C113.1 | Gain the Knowledge on electric circuits and its analysis |
| C113.2 | Acquire knowledge on solving circuit equations using network theorems |
| C113.3 | Understand the phenomenon of resonance in coupled circuits. |
| C113.4 | Acquired knowledge on obtaining the transient response of circuits. |
| C113.5 | Explain the Phasor diagrams and analysis of three phase circuits |

**Course Name: C114 ENVIRONMENTAL SCIENCE AND ENGINEERING**

Students will be able to

| | |
|---|---|
| C114.1 | Understand the importance of Environment, biodiversity, ecosystem and how to solve environmental related problems. |
| C114.2 | Identify and explain about the causes, effect and control measures of air pollution, water pollution, soil pollution, noise pollution, radioactive pollution and thermal pollution with its relevant case studies. |
| C114.3 | Discuss the various renewable and non-renewable resources and energy conservation processes. |
| C114.4 | Explain the social issues and solutions for sustainable environment with relevant Act and case studies. |

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|---|---|
| C114.5 | Summarize the impact of human population in the environment and its remedial measures. |

**Course Name: C115 ENGINEERING PRACTICES LABORATORY**

Students will be able to

| | |
|---|---|
| C115.1 | Fabricate carpentry components and pipe connections including plumbing works. |
| C115.2 | Use welding equipments to join the structures. |
| C115.3 | Carry out the basic machining operations |
| C115.4 | Make the models using sheet metal works |
| C115.5 | Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings. |

**Course Name: C116 ELECTRIC CIRCUITS LABORATORY**

Students will be able to

| | |
|---|---|
| C116.1 | Analyze the Circuit Problems using the Kirchhoff's law, Thevenins theorem, Norton's Theorem, Superposition theorem and Maximum power transfer theorem |
| C116.2 | Study of Analog and digital oscilloscopes and measurement of sinusoidal voltage, frequency and power factor. |
| C116.3 | Acquire Knowledge about the design and simulation of series and parallel resonance circuit. |
| C116.4 | Acquire knowledge about the simulation of three phase balanced and unbalanced Star delta networks Circuits |
| C116.5 | Validation of Frequency Response of RLC Electric Circuits |

**Course Name: C201 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS**

Students will be able to

| | |
|---|---|
| C201.1 | Understand how to solve the given standard partial differential equations |
| C201.2 | Solve differential equations using Fourier series analysis which plays a vital role in engineering |
| C201.3 | Appreciate the physical significance of Fourier series techniques in solving one and two applications dimensional heat flow problems and one dimensional wave equations. |
| C201.4 | Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. |
| C201.5 | Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems. |

**Course Name: C202 DIGITAL LOGIC CIRCUITS**

Students will be able to

| | |
|---|---|
| C202.1 | Design combinational and sequential Circuits |
| C202.2 | Study various number systems and simplify the logical expressions using Boolean functions |
| C202.3 | Design various synchronous and asynchronous circuits. |
| C202.4 | Acquire Knowledge about the asynchronous sequential circuits and PLDs |
| C203.5 | Introduce digital simulation for development of application oriented logic circuits. |

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**Course Name: C203 ELECTROMAGNETIC THEORY**

Students will be able to

| | |
|---|---|
| C203.1 | Understand the basic mathematical concepts related to electromagnetic vector fields. |
| C203.2 | Understand the basic concepts about electrostatic fields, electrical potential, energy density and their applications. |
| C203.3 | Acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications. |
| C203.4 | Clear the different methods of Emf generation and Maxwell's equations |
| C203.5 | Impart the basic concepts electromagnetic waves and characterizing parameters |

**Course Name: C204 ELECTRICAL MACHINES-I**

Students will be able to

| | |
|---|---|
| C204.1 | Analyze the magnetic-circuits. |
| C204.2 | Acquire the knowledge in constructional details of transformers. |
| C204.3 | Understand the concepts of electromechanical energy conversion. |
| C204.4 | Acquire the knowledge in working principles of DC Generator. |
| C204.5 | Acquire the knowledge in working principles of DC Motor |

**Course Name: C205 ELECTRONIC DEVICES & CIRCUITS**

Students will be able to

| | |
|---|---|
| C205.1 | Explain the structure and working operation of basic electronic devices. |
| C205.2 | Identify and differentiate both active and passive elements |
| C205.3 | Analyze the characteristics of different electronic devices such as diodes and transistors |
| C205.4 | Choose and adapt the required components to construct an amplifier circuit. |
| C205.5 | Employ the acquired knowledge in design and analysis of oscillators |

**Course Name: C206 POWER PLANT ENGINEERING**

Students will be able to

| | |
|---|---|
| C206.1 | Analyze the layout, construction and working of the components inside a thermal power plant. |
| C206.2 | Acquire the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. |
| C206.3 | Explain the layout, construction and working of the components inside nuclear power plants. |
| C206.4 | Identify the layout, construction and working of the components inside Renewable energy power plants. |
| C206.5 | Infer the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production. |

**Course Name: C207 ELECTRONICS LABORATORY**

Students will be able to

| | |
|---|---|
| C207.1 | Understand the electronic Circuits of SCR Characteristics |
| C207.2 | Analyze the Circuits of NPN and PNP Transistors |
| C207.3 | Design and check the response characteristics of Common Emitter Amplifier |

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| | |
|---|---|
| C207.4 | Design and Test the RC phase Shift and LC oscillators |
| C207.5 | Study of CRO and other equipments for frequency and Phase Measurements |

**Course Name: C208 ELECTRICAL MACHINES-I LABORATORY**

Students will be able to

| | |
|---|---|
| C208.1 | Understand and analyze DC Generator and its Characteristics |
| C208.2 | Analyze and understand the DC Motor and Its Characteristics |
| C208.3 | Understand and analyze Transformers and its Equivalent Circuits |
| C208.4 | Analyze the Speed Control Characteristics of DC motor |
| C208.5 | Analyze the characteristics of the DC motor-Generator Set |

**Course Name: C209 NUMERICAL METHODS**

Students will be able to

| | |
|---|---|
| C209.1 | Understand the basic concepts and techniques of solving algebraic and transcendental equations. |
| C209.2 | Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations |
| C209.3 | Apply the numerical techniques of differentiation and integration for engineering problems. |
| C209.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations |
| C209.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course Name: C210 ELECTRICAL MACHINES II**

Students will be able to

| | |
|---|---|
| C210.1 | Understand the construction and working principle of Synchronous Generator |
| C210.2 | Understand MMF curves and armature windings. |
| C210.3 | Acquire knowledge on Synchronous motor. |
| C210.4 | Clear the construction and working principle of Three phase Induction Motor |
| C210.5 | Acquire the construction and working principle of Special Machines and Synchronous Machines |

**Course Name: C211 TRANSMISSION & DISTRIBUTION**

Students will be able to

| | |
|---|---|
| C211.1 | Understand the importance and the functioning of transmission line parameters |
| C211.2 | Understand the concepts of Lines and Insulators |
| C211.3 | Acquire knowledge on the performance of Transmission lines. |
| C211.4 | Understand the importance of distribution of the electric power in power system. |
| C211.5 | Become familiar with the function of different components used in Transmission and Distribution levels of power system and modeling of these components |

**Course Name: C212 MEASUREMENTS & INSTRUMENTATION**

Students will be able to

| | |
|---|---|
| C212.1 | Acquire knowledge on Basic functional elements of instrumentation |
| C212.2 | Understand the concepts of Fundamentals of electrical and electronic instruments |
| C212.3 | Compare between various measurement techniques |

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| | |
|---|---|
| C212.4 | Acquire knowledge on Various storage and display devices |
| C212.5 | Understand the concepts Various transducers and the data acquisition systems |

**Course Name: C213 LINEAR INTEGRATED CIRCUITS AND APPLICATIONS**

Students will be able to

| | |
|---|---|
| C213.1 | Acquire knowledge in IC fabrication procedure |
| C213.2 | Analyze the characteristics of Op-Amp |
| C213.3 | Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits. |
| C213.4 | Understand and acquire knowledge on the Applications of Op-amp |
| C213.5 | Understand and analyse, linear integrated circuits their Fabrication and Application. |

**Course Name: C214 CONTROL SYSTEMS**

Students will be able to

| | |
|---|---|
| C214.1 | Develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals. |
| C214.2 | Do time domain and frequency domain analysis of various models of linear system. |
| C214.3 | Interpret characteristics of the system to develop mathematical model. |
| C214.4 | Design appropriate compensator for the given specifications. |
| C214.5 | Come out with solution for complex control problem. |

**Course Name: C215 ELECTRICAL MACHINES –II LABORATORY**

Students will be able to

| | |
|---|---|
| C215.1 | Understand and analyze EMF and MMF methods |
| C215.2 | Analyze the characteristics of V and Inverted V curves |
| C215.3 | Understand the importance of Synchronous machines |
| C215.4 | Understand the importance of Induction Machines |
| C215.5 | Acquire knowledge on separation of losses |

**Course Name: C216 LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY**

Students will be able to

| | |
|---|---|
| C216.1 | Understand and implement Boolean Functions. |
| C216.2 | Understand the importance of code conversion |
| C216.3 | Design and implement 4-bit shift registers |
| C216.4 | Acquire knowledge on Application of Op-Amp |
| C216.5 | Design and implement counters using specific counter IC |

**Course Name: C217 TECHNICAL SEMINAR**

Students will be able to

| | |
|---|---|
| C217.1 | Review the technological developments in current scenarios |
| C217.2 | Prepare for the future technological developments |
| C217.3 | Present the future technological developments to gain the public knowledge |
| C217.4 | Implement the technology developments with their needs |
| C217.5 | Ability to face the placement interviews |

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**Course Name: C301 POWER SYSTEM ANALYSIS**

Students will be able to

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|---|---|
| C301.1 | Model the power system under steady state operating condition |
| C301.2 | Understand and apply iterative techniques for power flow analysis |
| C301.3 | Model and carry out short circuit studies on power system |
| C301.4 | Model and analyze stability problems in power system |
| C301.5 | Acquire knowledge on Fault analysis. |

**Course Name: C302 MICROPROCESSOR & MICROCONTROLLER**

Students will be able to

| | |
|---|---|
| C302.1 | Acquire knowledge in Addressing modes & instruction set of 8085 & 8051. |
| C302.2 | Know the need & use of Interrupt structure 8085 & 8051. |
| C302.3 | Understand the importance of Interfacing |
| C302.4 | Explain the architecture of Microprocessor and Microcontroller. |
| C302.5 | Develop the Microprocessor and Microcontroller based applications. |

**Course Name: C303 POWER ELECTRONICS**

Students will be able to

| | |
|---|---|
| C303.1 | Analyze AC-AC and DC-DC and DC-AC converters. |
| C303.2 | Choose the converters for real time applications. |
| C303.3 | Identify basic requirements for power electronics based design application. |
| C303.4 | Develop skills to build, and troubleshoot power electronics circuits |
| C303.5 | Understand the use of power converters in commercial and industrial applications. |

**Course Name: C304 DIGITAL SIGNAL PROCESSING**

Students will be able to

| | |
|---|---|
| C304.1 | Acquire knowledge on Signals and systems & their mathematical representation. |
| C304.2 | Understand and analyze the discrete time systems. |
| C304.3 | Analyze the transformation techniques & their computation. |
| C304.4 | Understand the types of filters and their design for digital implementation. |
| C304.5 | Acquire knowledge on programmability digital signal processor & quantization effects. |

**Course Name: C305 OBJECT ORIENTED PROGRAMMING**

Students will be able to

| | |
|---|---|
| C305.1 | Develop Java programs using OOP principles |
| C305.2 | Create Java programs with the concepts inheritance and interfaces |
| C305.3 | Build Java applications using exceptions and I/O streams |
| C305.4 | Increase Java applications with threads and generics classes |
| C305.5 | Create interactive Java programs using swings |

**Course Name: C306 SENSORS AND TRANSDUCERS**

Students will be able to

| | |
|---|---|
| C306.1 | Expertise in various calibration techniques and signal types for sensors. |
| C306.2 | Apply the various sensors in the Automotive and Mechatronics applications |
| C306.3 | Study the basic principles of various smart sensors. |
| C306.4 | Implement the DAQ systems with different sensors for real time applications |

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| | |
|---|---|
| C306.5 | Learn the fundamentals of signal conditioning, data acquisition and communication systems used in mechatronics system development |

**Course Name: C307 CONTROL AND INSTRUMENTATION LAB ORATORY**

Students will be able to

| | |
|---|---|
| C307.1 | Understand control theory and apply them to electrical engineering problems. |
| C307.2 | Design compensators in lag, lead and lag-lead compensators. |
| C307.3 | Understand the basic concepts of bridge networks |
| C307.4 | The basics of signal conditioning circuits |
| C307.5 | Study the simulation packages |

**Course Name: C308 PROFESSIONAL COMMUNICATION**

Students will be able to

| | |
|---|---|
| C308.1 | Make effective presentations |
| C308.2 | Participate confidently in Group Discussions. |
| C308.3 | Attend job interviews and be successful in them. |
| C308.4 | Develop adequate Soft Skills required for the workplace |
| C308.5 | Develop their confidence and help them attend interviews successfully |

**Course Name: C309 OBJECT ORIENTED PROGRAMMING LABORATORY**

Students will be able to

| | |
|---|---|
| C309.1 | Develop and implement Java programs for simple applications that make use of classes, packages and interfaces |
| C309.2 | Develop and implement Java programs with array list, exception handling and multithreading |
| C309.3 | Design applications using file processing, generic programming and event handling. |
| C309.4 | Design a event-driven programming paradigm of JAVA to Decimal and Scientific Manipulators |
| C309.5 | Design an mini project in JAVA Programming and its application |

**Course Name: C310 SOLID STATE DRIVES**

Students will be able to

| | |
|---|---|
| C310.1 | Understand and suggest a converter for solid state drive. |
| C310.2 | Study about the steady state operation and transient dynamics of a motor load system. |
| C310.3 | Analyze the operation of the converter/chopper fed dc drive. |
| C310.4 | Analyze the operation and performance of AC motor drives. |
| C310.5 | Design and Analyze the current and speed controllers for a closed loop solid state DC motor drive. |

**Course Name: C311 PROTECTION AND SWITCHGEAR**

Students will be able to

| | |
|---|---|
| C311.1 | Understand and analyze Electromagnetic and Static Relays. |
| C311.2 | Suggest suitability circuit breaker. |
| C311.3 | Find the causes of abnormal operating conditions of the apparatus and system |

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| | |
|---|---|
| C311.4 | Study about the apparatus protection, static and numerical relays. |
| C311.5 | Acquire knowledge on functioning of circuit breaker. |

**Course Name: C312 EMBEDDED SYSTEMS**

Students will be able to

| | |
|---|---|
| C312.1 | Understand and analyze Embedded systems. |
| C312.2 | Suggest an embedded system for a given application. |
| C312.3 | Operate various Embedded Development Strategies |
| C312.4 | Study about the bus Communication in processors. |
| C312.5 | Understand basics of Real time operating system. |

**Course Name: C313 INTELLECTUAL PROPERTY RIGHTS**

Students will be able to

| | |
|---|---|
| C313.1 | Introduce the concepts of the Intellectual Property Rights |
| C313.2 | Acquire Knowledge about the registration of Intellectual property rights. |
| C313.3 | Gain the Knowledge of Agreements and legislations of Intellectual property Rights. |
| C313.4 | Understand the digital products and their laws of intellectual property rights |
| C313.5 | Study about the Enforcement of Intellectual property rights |

**Course Name: C314 SPECIAL ELECTRICAL MACHINES**

Students will be able to

| | |
|---|---|
| C314.1 | Analyze and design controllers for special Electrical Machines |
| C314.2 | Acquire the knowledge on construction and operation of stepper motor. |
| C314.3 | Acquire the knowledge on construction and operation of stepper switched Reluctance motors. |
| C314.4 | Construction, principle of operation, switched reluctance motors. |
| C314.5 | Acquire the knowledge on construction and operation of permanent magnet brushless D.C. motors |

**Course Name: C315 POWER ELECTRONICS AND DRIVES LABORATORY**

Students will be able to

| | |
|---|---|
| C315.1 | Experiment about switching characteristics various switches. |
| C315.2 | Analyze about AC to DC converter circuits. |
| C315.3 | Analyze about DC to AC circuits. |
| C315.4 | Acquire knowledge on AC to AC converters |
| C315.5 | Acquire knowledge on simulation software. |

**Course Name: C316 MICROPROCESSOR AND MICROCONTROLLER LABORATORY**

Students will be able to

| | |
|---|---|
| C316.1 | Programming logics for code conversion. |
| C316.2 | Acquire knowledge on A/D and D/A. |
| C316.3 | Understand basics of serial communication. |
| C316.4 | Understand and impart knowledge in DC and AC motor interfacing. |
| C313.5 | Understand basics of software simulators. |

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**Course Name: C317 MINI PROJECT**

Students will be able to

| | |
|---|---|
| C317.1 | Develop the ability to solve a specific problem right from its identification |
| C317.2 | Develop the ability to literature review till the successful solution of the problem |
| C317.3 | Train the students in preparing project reports and to face reviews and viva voce examination. |
| C317.4 | Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology. |
| C317.5 | Acknowledge the value of continuing education for oneself and to stay up with technology advancements |

**Course Name: C401 HIGH VOLTAGE ENGINEERING**

Students will be able to

| | |
|---|---|
| C401.1 | Understand Transients in power system. |
| C401.2 | Understand Generation and measurement of high voltage. |
| C401.3 | Understand High voltage testing. |
| C401.4 | Understand various types of over voltages in power system. |
| C401.5 | Test power apparatus and insulation coordination |

**Course Name: C402 POWER SYSTEM OPERATION AND CONTROL**

Students will be able to

| | |
|---|---|
| C402.1 | Analyze the control actions to be implemented on the system to meet the minute-to-minute variation of system demand. |
| C402.2 | Understand the significance of power system operation and control. |
| C402.3 | Acquire knowledge on real power-frequency interaction. |
| C402.4 | Understand the reactive power-voltage interaction. |
| C402.5 | Design SCADA and its application for real time operation. |

**Course Name: C403 RENEWABLE ENERGY SYSTEMS**

Students will be able to

| | |
|---|---|
| C403.1 | Create awareness about renewable Energy Sources and technologies. |
| C403.2 | Get adequate inputs on a variety of issues in harnessing renewable Energy. |
| C403.3 | Recognize current and possible future role of renewable energy sources. |
| C403.4 | Explain the various renewable energy resources and technologies and their applications. |
| C403.5 | Understand basics about biomass energy and Solar Energy. |

**Course Name: C404 TESTING OF MATERIALS**

Students will be able to

| | |
|---|---|
| C404.1 | Identify suitable testing technique to inspect industrial component |
| C404.2 | Ability to use the different technique and know its applications and limitations |
| C404.3 | Acquire knowledge about the Mechanical testing |
| C404.4 | Gain the Knowledge of Non destructive Testing |
| C404.5 | Study about the materials characterization testing and other testing. |

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**Course Name: C405 DISASTER MANAGEMENT**

Students will be able to

| | |
|---|---|
| C405.1 | Differentiate the types of disasters, causes and their impact on environment and society |
| C405.2 | Assess vulnerability and various methods of risk reduction measures as well as mitigation. |
| C405.3 | Draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disaster damage assessment and management |
| C405.4 | Acquire knowledge about the disaster risks management in Indian scenarios |
| C405.5 | Study of Case studies and Field work of Disaster management |

**Course Name: C406 POWER SYSTEM TRANSIENTS**

Students will be able to

| | |
|---|---|
| C406.1 | Understand and analyze switching and lightning transients. |
| C406.2 | Acquire knowledge on generation of switching transients and their control. |
| C406.3 | Understand the importance of propagation, reflection and refraction of travelling waves. |
| C406.4 | Find the voltage transients caused by faults. |
| C406.5 | Understand the concept of circuit breaker action, load rejection on integrated power system. |

**Course Name: C407 POWER SYSTEM SIMULATION LABORATORY**

Students will be able to

| | |
|---|---|
| C407.1 | Acquire knowledge on Formation of Bus Admittance and Impedance Matrices and Solution of Networks. |
| C407.2 | Analyze the power flow using GS and NR method |
| C407.3 | Find Symmetric and Unsymmetrical fault |
| C407.4 | Understand the economic dispatch. |
| C407.5 | Analyze the electromagnetic transients |

**Course Name: C408 RENEWABLE ENERGY SYSTEMS LABORATORY**

Students will be able to

| | |
|---|---|
| C408.1 | Train the students in Renewable Energy Sources and technologies. |
| C408.2 | Provide adequate inputs on a variety of issues in harnessing Renewable Energy. |
| C408.3 | Simulate the various Renewable energy sources. |
| C408.4 | Recognize current and possible future role of Renewable energy sources. |
| C408.5 | Understand basics of Intelligent Controllers. |

**Course Name: C409 PRINCIPLES OF MANAGEMENT**

Students will be able to

| | |
|---|---|
| C409.1 | Know about the management and organizing Skills. |
| C409.2 | Understand the Planning Skills in management. |
| C409.3 | Acquire knowledge on organizing. |
| C409.4 | Study about the Directing Skills. |
| C409.5 | Clear the Controlling policies in management System. |

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**Course Name: C410 HIGH VOLTAGE DC TRANSMISSION**

Students will be able to

| | |
|---|---|
| C410.1 | Understand the principles and types of HVDC system. |
| C410.2 | Understand the concepts of HVDC converters. |
| C410.3 | Acquire knowledge on DC link control. |
| C410.4 | Understand the concepts of reactive power management, harmonics andpower flow analysis. |
| C410.5 | Get knowledge about Planning of DC power transmission and comparisonwith AC power transmission. |

**Course Name: C411 PROJECT WORK**

Students will be able to

| | |
|---|---|
| C411.1 | Develop the ability to solve a specific problem right from its identification |
| C411.2 | Develop the ability to literature review till the successful solution of the problem |
| C411.3 | Train the students in preparing project reports and to face reviews and viva voce examination. |
| C411.4 | Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology. |
| C411.5 | Acknowledge the value of continuing education for oneself and to stay up with technology advancements |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### Anna University Regulation 2017

### List of course names

| S.No. | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS8151 | Communicative English |
| 2. | C102 | MA8151 | Engineering Mathematics - I |
| 3. | C103 | PH8151 | Engineering Physics |
| 4. | C104 | CY8151 | Engineering Chemistry |
| 5. | C105 | GE8151 | Problem Solving and Python Programming |
| 6. | C106 | GE8152 | Engineering Graphics |
| 7. | C107 | GE8161 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS8161 | Physics and Chemistry Laboratory |
| 9. | C109 | HS8251 | Technical English |
| 10. | C110 | MA8251 | Engineering Mathematics - II |
| 11. | C111 | PH8253 | Physics for Electronics Engineering |
| 12. | C112 | BE8254 | Basic Electrical and Instrumentation Engineering |
| 13. | C113 | EC8251 | Circuit Analysis |
| 14. | C114 | EC8252 | Electronic Devices |
| 15. | C115 | EC8261 | Circuits and Devices Laboratory |
| 16. | C116 | GE8261 | Engineering Practices Laboratory |
| 17. | C201 | MA8352 | Linear Algebra and Partial Differential Equations |
| 18. | C202 | EC8393 | Fundamentals of Data Structures in C |
| 19. | C203 | EC8351 | Electronic Circuits I |
| 20. | C204 | EC8352 | Signals and Systems |
| 21. | C205 | EC8392 | Digital Electronics |
| 22. | C206 | EC8391 | Control Systems Engineering |
| 23. | C207 | EC8381 | Fundamentals of Data Structures in C Laboratory |
| 24. | C208 | EC8361 | Analog and Digital Circuits Laboratory |
| 25. | C209 | HS8381 | Interpersonal Skills/Listening &Speaking |
| 26. | C210 | MA8451 | Probability And Random Processes |
| 27. | C211 | EC8452 | Electronic Circuits II |
| 28. | C212 | EC8491 | Communication Theory |
| 29. | C213 | EC8451 | Electromagnetic Fields |
| 30. | C214 | EC8453 | Linear Integrated Circuits |
| 31. | C215 | GE8291 | Environmental Science and Engineering |

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| | | | |
|---|---|---|---|
| 32. | C216 | EC8461 | Circuits Design and Simulation Laboratory |
| 33. | C217 | EC8462 | Linear Integrated Circuits Laboratory |
| 34. | C301 | EC8501 | Digital Communication |
| 35. | C302 | EC8553 | Discrete Time Signal Processing |
| 36. | C303 | EC8552 | Computer Architecture and Organization |
| 37. | C304 | EC8551 | Communication Networks |
| 38. | C305 | GE8077 | Total Quality Management |
| 39. | C306 | ORO551 | Renewable Energy Sources |
| 40. | C307 | EC8562 | Digital Signal Processing Laboratory |
| 41. | C308 | EC8561 | Communication Systems Laboratory |
| 42. | C309 | EC8563 | Communication Networks Laboratory |
| 43. | C310 | EC8691 | Microprocessors and Microcontrollers |
| 44. | C311 | EC8095 | VLSI Design |
| 45. | C312 | EC8652 | Wireless Communication |
| 46. | C313 | MG8591 | Principles of Management |
| 47. | C314 | EC8651 | Transmission Lines and RF Systems |
| 48. | C315 | EC8004 | Wireless Networks |
| 49. | C316 | EC8681 | Microprocessor And Microcontroller Laboratory |
| 50. | C317 | EC8661 | VLSI Design Laboratory |
| 51. | C318 | EC8611 | Technical Seminar |
| 52. | C319 | HS8581 | Professional Communication |
| 53. | C401 | EC8701 | Antennas and Microwave Engineering |
| 54. | C402 | EC8751 | Optical Communication |
| 55. | C403 | EC8791 | Embedded And Real Time Systems |
| 56. | C404 | EC8702 | Adhoc and Wireless Sensor Networks |
| 57. | C405 | EC8071 | CognitiveRadio |
| 58. | C406 | OCE751 | Environmental &Social Impact Assessment |
| 59. | C407 | EC8711 | Embedded Laboratory |
| 60. | C408 | EC8761 | Advanced Communication Laboratory |
| 61. | C409 | EC8093 | Digital Image Processing |
| 62. | C410 | EC8094 | Satellite Communication |
| 63. | C411 | EC8811 | Project Work |

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**Course Name: C101 (COMMUNICATIVE ENGLISH)**
**Learners will be able to:**

| | |
|---|---|
| C101.1 | Explain the articles of a general kind in magazines and newspapers |
| C101.2 | Understand the conversations and short talks delivered in English. |
| C101.3 | Complete the informal conversations effectively. |
| C101.4 | Write short essays of a general kind and personal letters and emails in English. |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 (ENGINEERING MATHEMATICS - I)**
**Students Should demonstrate competency in the following skills:**

| | |
|---|---|
| C102.1 | Calculate extreme values of a function |
| C102.2 | Explain the differential calculus for multi variable functions. |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.4 | Estimate the area and volume using integrals |
| C102.5 | Solve higher order linear Ordinary Differential Equations with constant and variable coefficients. |

**Course Name: C103 (ENGINEERING PHYSICS)**
**The students will be able to:**

| | |
|---|---|
| C103.1 | Gain knowledge on the basics of properties of matter and its applications. |
| C103.2 | Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics. |
| C103.3 | Relate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers |
| C103.4 | Identify, formulate and solve problems in quantum mechanics and its applications in tunnelling microscopes |
| C103.5 | Interpret the basics of crystals, their structures and different crystal growth techniques |

**Course Name: C104 (ENGINEERING CHEMISTRY)**
**The students will be able to:**

| | |
|---|---|
| C104.1 | Summarize the water related problems in boilers and their treatment techniques |
| C104.2 | Understanding the basic concepts of surface chemistry and catalysis. |
| C104.3 | Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and the purpose and significance of alloys. |
| C104.4 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |
| C104.5 | Understand about principles and generation of energy in batteries, nuclear |

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| | |
|---|---|
| | reactors, solar cells, wind mills, super capacitors and fuel cells. |

**Course Name: C105 (PROBLEM SOLVING AND PYTHON PROGRAMMING)**

**The students will be able to:**

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems |
| C105.2 | Understand basic commands of python and write simple Python programs. |
| C105.3 | Develop Python programs with conditional and loops and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, and dictionaries. |
| C105.5 | Read and write data from/to files in Python Programs |

**Course Name: C106 (ENGINEERING GRAPHICS)**

**The students will be able to:**

| | |
|---|---|
| C106.1 | Familiarize with the fundamentals and standards of Engineering graphics |
| C106.2 | Perform freehand sketching of basic geometrical constructions and multiple views of objects. |
| C106.3 | Project orthographic projections of lines and plane surfaces. |
| C106.4 | Draw projections and solids and development of surfaces. |
| C106.5 | Visualize and to project isometric and perspective sections of simple solids. |

**Course Name: C107 (PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY)**

**The students will be able to**

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 (PHYSICS AND CHEMISTRY LABORATORY)**

**The students can acquire practical skills in**

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course Name: C109 (TECHNICAL ENGLISH)**

**Learners will be able to**

| | |
|---|---|
| C109.1 | Focus their strategies and skills which enhance their ability to read and comprehend engineering and technology texts. |
| C109.2 | Analyze their ability to Speak appropriately and effectively in varied formal and informal contexts. |
| C109.3 | Prepare effective reports and winning job applications. |
| C109.4 | Make presentations and Participate in Group Discussions. |
| C109.5 | Show their communicative competence in writing and speaking. |

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**Course Name: C110 (ENGINEERING MATHEMATICS - II)**
**The students will able to**

| | |
|---|---|
| C110.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C110.2 | Estimate the line, surface and volume integral by Green's, Stoke's and Gauss Divergence Theorem. |
| C110.3 | Classify the conformal mapping for different kinds of domain and Milne Thomson method to find analytic functions. |
| C110.4 | Explain the contour integral with an integrand which has singularities in the closed region. |
| C110.5 | Apply the concept of Laplace Transform to the solution of linear Ordinary differential equations with constant coefficients. |

**Course Name: C111 (PHYSICS FOR ELECTRONICS ENGINEERING)**
**The students will able to:**

| | |
|---|---|
| C111.1 | Gain knowledge on classical and quantum electron theories, and energy band structures. |
| C111.2 | Interpret the basics of semiconductor physics and its applications in various devices related with engineering applications. |
| C111.3 | Recognize the basic concepts of magnetic and dielectric properties of materials and their applications in data storages. |
| C111.4 | Ability to know and to understand the functioning of optical materials for optoelectronics. |
| C111.5 | Apply the techniques to manufacturing of quantum structures and their applications in carbon electronics especially spintronics on nano electronic devices. |

**Course Name: C112 (BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING)**
**The students will be able to:**

| | |
|---|---|
| C112.1 | Understand the concept of three phase power circuits and measurement. |
| C112.2 | Comprehend the concepts in electrical generators. |
| C112.3 | Comprehend the concepts in electrical motors. |
| C112.4 | Comprehend the concepts in single Phase and three phase Transformer. |
| C112.5 | Choose appropriate measuring instruments for given application |

**Course Name: C113 (CIRCUIT ANALYSIS)**
**The students should be able to:**

| | |
|---|---|
| C113.1 | Develop the capacity to analyze electrical circuits |
| C113.2 | Apply the circuit theorems in real time applications. |
| C113.3 | Design and understand and evaluate the AC Circuits. |
| C113.4 | Design and understand and evaluate the DC circuits. |
| C113.5 | Acquire knowledge the transient and state response of the circuits. |

**Course Name: C114 (ELECTRONIC DEVICES)**
**The students should be able to:**

| | |
|---|---|
| C114.1 | Explain the V-I characteristic of diode and parameters of diode. |
| C114.2 | Explain Input and Output characteristics of BJT and equivalent models |

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| | |
|---|---|
| | Describe the equivalence circuits of transistors |
| C114.3 | Explain the Drain and Transfer characteristic of FET, MOSFET. |
| C114.4 | Operate special semiconductor devices such as Schottky barrier diode-Zener diode-Varactor diode –Tunnel diode- Gallium Arsenide device. |
| C114.5 | Operate the basic electronic devices such as Power control devices, LED, LCD and other Opto-electronic devices |

**Course Name: C115 (CIRCUITS AND DEVICES LABORATORY)**

**The students should be able to:**

| | |
|---|---|
| C115.1 | Analyze the characteristics of basic electronic devices |
| C115.2 | Design RL and RC circuits |
| C115.3 | Verify Thevenin & Norton theorem |
| C115.4 | Verify KVL & KCL |
| C115.5 | Verify Super Position Theorems |

**Course Name: C116 (ENGINEERING PRACTICES LABORATORY)**

**The students should be able to:**

| | |
|---|---|
| C116.1 | Fabricate carpentry components and pipe connections including plumbing works. |
| C116.2 | Use welding equipment's to join the structures. |
| C116.3 | Carry out the basic machining operations |
| C116.4 | Make the models using sheet metal works |
| C116.5 | Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings. |

**Course Name: C201 (LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATION)**

**Students Should able to:**

| | |
|---|---|
| C201.1 | Explain the fundamental concepts of advanced algebra and their role in modern 38 mathematics and applied contexts |
| C201.2 | Demonstrate accurate and efficient use of advanced algebraic techniques |
| C201.3 | Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text. |
| C201.4 | Solve various types of partial differential equations |
| C201.5 | Solve engineering problems using Fourier series |

**Course Name: C202 (FUNDAMENTALS OF DATA STRUCTURES IN C)**

**Students will be able to:**

| | |
|---|---|
| C202.1 | Implement linear and non-linear data structure operations using C |
| C202.2 | Suggest appropriate linear / non-linear data structure for any given data set |
| C202.3 | Apply hashing concepts for a given problem |
| C202.4 | Modify or suggest new data structure for an application |
| C202.5 | Appropriately choose the sorting algorithm for an application |

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**Course Name: C203 (ELECTRONIC CIRCUITS I)**
**Students Should be able to:**

| | |
|---|---|
| C203.1 | Acquire knowledge of Working principles, characteristics and applications of BJT and FET |
| C203.2 | Acquire knowledge of Frequency response characteristics of BJT and FET amplifiers |
| C203.3 | Analyze the performance of small signal BJT and FET amplifiers |
| C203.4 | Analyze the performance of single stage and multi stage amplifiers |
| C203.5 | Apply the knowledge gained in the design of electronic circuits |

**Course Name: C204 (SIGNALS AND SYSTEMS)**
**Students Should be able to:**

| | |
|---|---|
| C204.1 | Determine if a given system is linear/causal/stable |
| C204.2 | Capable of determining the frequency components present in a deterministic signal |
| C204.3 | Capable of characterizing LTI systems in the time domain and frequency domain |
| C204.4 | Compute the output of discrete time signals |
| C204.5 | Compute the output of an LTI system in the time and frequency domains |

**Course Name: C205 (DIGITAL ELECTRONICS)**
**Students Should be able to:**

| | |
|---|---|
| C205.1 | Use digital electronics in the present contemporary world |
| C205.2 | Design various combinational digital circuits using logic gates |
| C205.3 | Do the analysis and design procedures for synchronous and asynchronous sequential circuits |
| C205.4 | Use the semiconductor memories and related technology |
| C205.5 | Use electronic circuits involved in the design of logic gates |

**Course Name: C206 (CONTROL SYSTEMS ENGINEERING)**
**Students Should be able to:**

| | |
|---|---|
| C206.1 | Identify the various control system components and their representations. |
| C206.2 | Analyze the various time domain parameters |
| C206.3 | Analysis the various frequency response plots and its system |
| C206.4 | Apply the concepts of various system stability criterions. |
| C206.5 | Design various transfer functions of digital control system using state variable models |

**Course Name: C207 (FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C207.1 | Write basic and advanced programs in C |
| C207.2 | Implement functions and recursive functions in C |
| C207.3 | Implement data structures using C |
| C207.4 | Choose appropriate sorting algorithm for an application and implement it in a modularized way |

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**Course Name: C208 (ANALOG AND DIGITAL CIRCUITS LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C208.1 | Design and Test rectifiers, filters and regulated power supplies. |
| C208.2 | Design and Test BJT/JFET amplifiers, Design and Test the digital logic circuits |
| C208.3 | Differentiate cascode and cascade amplifiers, Measure CMRR in differential amplifier |
| C208.4 | Analyze the limitation in bandwidth of single stage and multi stage amplifier |
| C208.5 | Simulate and analyze amplifier circuits using PSpice. |

**Course Name: C209 (INTERPERSONAL SKILLS/LISTENING&SPEAKING)**
**Learners will be able to:**

| | |
|---|---|
| C209.1 | Listen and respond appropriately. |
| C209.2 | Participate in group discussions |
| C209.3 | Make effective presentations |
| C209.4 | Participate confidently and appropriately in conversations both formal and informal |

**Course Name: C210 (PROBABILITY AND RANDOM PROCESSES)**
**Students Should be able to:**

| | |
|---|---|
| C210.1 | Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. |
| C210.2 | Understand the basic concepts of one- and two-dimensional random variables and apply in engineering applications |
| C210.3 | Apply the concept random processes in engineering disciplines. |
| C210.4 | Understand and apply the concept of correlation and spectral densities. |
| C210.5 | Analyze the response of random inputs to linear time invariant systems. |

**Course Name: C211 (ELECTRONIC CIRCUITS II)**
**Students Should be able to:**

| | |
|---|---|
| C211.1 | Analyze different types of amplifier, oscillator and multivibrator circuits |
| C211.2 | Design BJT amplifier and oscillator circuits |
| C211.3 | Analyze transistorized amplifier and oscillator circuits |
| C211.4 | Design and analyze feedback amplifiers |
| C211.5 | Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors |

**Course Name: C212 (COMMUNICATION THEORY)**
**Students Should be able to:**

| | |
|---|---|
| C212.1 | Design AM communication systems. |
| C212.2 | Design Angle modulated communication systems |
| C212.3 | Apply the concepts of Random Process to the design of Communication systems |
| C212.4 | Analyze the noise performance of AM and FM systems |

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| | |
|---|---|
| C212.5 | Analyze & performance of source coding |

**Course Name: C213 (ELECTROMAGNETIC FIELDS)**
**Students Should be able to:**

| | |
|---|---|
| C213.1 | Analyze field potentials due to static changes and static magnetic fields. |
| C213.2 | Explain how materials affect electric and magnetic fields. |
| C213.3 | Analyze the relation between the fields under time varying situations. |
| C213.4 | Discuss the principles of propagation of uniform plane waves |
| C213.5 | Analyze the Maxwell's equations |

**Course Name: C214 (LINEAR INTEGRATED CIRCUITS)**
**Students Should be able to:**

| | |
|---|---|
| C214.1 | Demonstrate the linear and non-linear applications of an Op-amp. |
| C214.2 | Design applications using analog multiplier and PLL. |
| C214.3 | Design ADC and DAC using op – amps. |
| C214.4 | Generate waveforms using op – amp circuits. |
| C214.5 | Analyze special function ICs |

**Course Name: C215 (ENVIRONMENTAL SCIENCE AND ENGINEERING)**
**Students Should be able to:**

| | |
|---|---|
| C215.1 | Interpret the importance of natural environment and ecosystem concepts and Infer the values and conservation of biodiversity. |
| C215.2 | Explain the causes, effects and control measures of various type of pollution. |
| C215.3 | Classify the various types of natural resources and its conservation methods. |
| C215.4 | Outline the social issues and environmental problems for sustainable development. |
| C215.5 | Relate the environment and social impacts of population growth. |

**Course Name: C216 (CIRCUIT DESIGN AND SIMULATION LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C216.1 | Analyze various types of feedback amplifiers |
| C216.2 | Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators |
| C216.3 | Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool |

**Course Name: C217 (LINEAR INTEGRATED CIRCUITS LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C217.1 | Design oscillators and amplifiers using operational amplifiers. |
| C217.2 | Design filters using Op amp and perform experiment on frequency response |
| C217.3 | Analyse the working of PLL and use PLL as frequency multiplier |
| C217.4 | Design DC power supply using ICs. |
| C217.5 | Analyse the performance of oscillators and multivibrators using SPICE |

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**Course Name: C301 (DIGITAL COMMUNICATION)**
**Students Should be able to:**

| | |
|---|---|
| C301.1 | Know the principles of sampling & quantization |
| C301.2 | Study of the various waveform coding schemes |
| C301.3 | Learn about the various baseband transmission schemes |
| C301.4 | Understand the various band pass signaling schemes |
| C301.5 | Analyze about the fundamentals of channel coding |

**Course Name: C302 (DISCRETE-TIME SIGNAL PROCESSING)**
**Students Should be able to:**

| | |
|---|---|
| C302.1 | Apply DFT for the analysis of digital signals & systems |
| C302.2 | Design IIR and FIR filters |
| C302.3 | Characterize finite Word length effect on filters |
| C302.4 | Design the Multirate Filters |
| C302.5 | Apply Adaptive Filters to equalization |

**Course Name: C303 (COMPUTER ARCHITECTURE AND ORGANIZATION)**
**Students Should be able to:**

| | |
|---|---|
| C303.1 | Understand the data representation, instruction formats and the operation of a digital computer |
| C303.2 | Analyze fixed point and floating-point arithmetic for ALU operation |
| C303.3 | Design and analyze pipelined control units |
| C303.4 | Evaluate performance of memory systems. |
| C303.5 | Understand parallel processing architectures. |

**Course Name: C304 (COMMUNICATION NETWORKS)**
**Students Should be able to:**

| | |
|---|---|
| C304.1 | Identify the components required to build different types of networks |
| C304.2 | Choose the required functionality at each layer for given application |
| C304.3 | Identify solution for each functionality at each layer |
| C304.4 | Trace the flow of information from one node to another node in the network |
| C304.5 | Analyze the flow control and congestion control algorithms |

**Course Name: C305 (TOTAL QUALITY MANAGEMENT)**
**Students Should be able to:**

| | |
|---|---|
| C305.1 | Apply the tools and techniques of quality management to manufacturing and services processes. |
| C305.2 | To facilitate the understanding of Quality Management principles and process. |
| C305.3 | Enable the students to create an awareness on Engineering Ethics and Human Values |
| C305.4 | To instill Moral and Social Values and Loyalty and to appreciate the rights of others. |
| C305.5 | Understand the need of ISO standards and its benefits |

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**Course Name: C306 (RENEWABLE ENERGY SOURCES)**
**Students Should be able to:**

| | |
|---|---|
| C306.1 | Understanding the physics of solar radiation. |
| C306.2 | Classify the solar energy collectors and methodologies of storing solar energy |
| C306.3 | Knowledge in applying solar energy in a useful way |
| C306.4 | Knowledge in wind energy and biomass with its economic aspects |
| C306.5 | Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies |

**Course Name: C307 (DIGITAL SIGNAL PROCESSING LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C307.1 | Carry out simulation of DSP systems |
| C307.2 | Demonstrate their abilities towards DSP processor based implementation of DSP systems |
| C307.3 | Analyze the architecture of a DSP processor |
| C307.4 | Design and implement the FIR and IIR filters in DSP processor for performing filtering operation over real time signals |
| C307.5 | Design a DSP system for a various application of DSP |

**Course Name: C308 (COMMUNICATION SYSTEMS LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C308.1 | Simulate end-to-end Communication Link |
| C308.2 | Demonstrate their knowledge in base band signaling schemes through implementation of FSK, PSK and DPSK |
| C308.3 | Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system |
| C308.4 | Simulate & validate the various functional modules of a communication systems |
| C308.5 | Simulate end-to-end Communication Link |

**Course Name: C309 (COMMUNICATION NETWORKS LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C309.1 | Communicate between two desktop computers |
| C309.2 | Implement the different protocols |
| C309.3 | Program using sockets |
| C309.4 | Implement and compare the various routing algorithms |
| C309.5 | Use simulation tool. |

**Course Name: C310 (MICROPROCESSOR AND MICROCONTROLLER)**
**Students Should be able to:**

| | |
|---|---|
| C310.1 | Understand the architecture and basic addressing modes of 8086 |
| C310.2 | Design Memory Interfacing circuits of 8086 |
| C310.3 | Design and interface I/O circuits. |
| C310.4 | Understand the architecture and basic addressing modes of 8051 microcontroller |

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| | |
|---|---|
| C310.5 | Design and implement 8051 microcontroller based systems. |

**Course Name: C311 (VLSI DESIGN)**

**Students Should be able to:**

| | |
|---|---|
| C311.1 | Realize the concepts of digital building blocks using MOS transistor. |
| C311.2 | Design combinational MOS circuits and power strategies |
| C311.3 | Design and construct Sequential Circuits and Timing systems. |
| C311.4 | Design arithmetic building blocks and memory subsystems. |
| C311.5 | Apply and implement FPGA design flow and testing. |

**Course Name: C312 (WIRELESS COMMUNICATION)**

**Students Should be able to:**

| | |
|---|---|
| C312.1 | Characterize wireless channels |
| C312.2 | Design and implement various signaling schemes for fading channels |
| C312.3 | Design a cellular system |
| C312.4 | Compare multipath mitigation techniques and analyze their performance |
| C312.5 | Design and implement systems with transmit/receive diversity and MIMO systems and analyze their performance |

**Course Name: C313 (PRINCIPLES OF MANAGEMENT)**

Students will be able to have

| | |
|---|---|
| C313.1 | Clear understanding of managerial functions like planning, organizing, staffing |
| C313.2 | Clear understanding of managerial functions like leading & controlling |
| C313.3 | Same basic knowledge on international aspect of management |
| C313.4 | Analyze and understand about the motivational theories and motivational concepts |
| C313.5 | Give solutions for the productivity problems |

**Course Name: C314 (TRANSMISSION LINES AND RF SYSTEMS)**

**Students Should be able to:**

| | |
|---|---|
| C314.1 | Understand the various types of transmission lines and its characteristics |
| C314.2 | Explain about high frequency line, power and impedance measurements |
| C314.3 | Calculate impart technical knowledge in impedance matching using smith chart |
| C314.4 | Analyze the characteristics of TE and TM waves |
| C314.5 | Design a acquaintance with RF system transceiver design |

**Course Name: C315 (WIRELESS NETWORKS)**

**Students Should be able to:**

| | |
|---|---|
| C315.1 | Design and implement wireless network environment for any application using latest wireless protocols and standards |
| C315.2 | Select the suitable network depending on the availability and requirement |
| C315.3 | Conversant with the latest 3G networks and its architecture |
| C315.4 | Implement different type of applications for smart phones and mobile devices with latest network strategies |
| C315.5 | Conversant with the latest 4G networks and its architecture |

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**Course Name: C316 (MICROPROCESSOR AND MICROCONTROLLER LABORATORY)**

**Students Should be able to:**

| | |
|---|---|
| C316.1 | Write ALP Programmes for fixed and Floating Point and Arithmetic |
| C316.2 | Interface different I/Os with processor |
| C316.3 | Generate waveforms using Microprocessors |
| C316.4 | Execute Programs in 8051 |
| C316.5 | Explain the difference between simulator and Emulator |

**Course Name: C317(VLSI DESIGN LABORATORY)**

**Students Should be able to:**

| | |
|---|---|
| C317.1 | Write HDL code for basic as well as advanced digital integrated circuits. |
| C317.2 | Import the logic modules into FPGA Boards |
| C317.3 | Synthesize, Place and Route the digital IPs. |
| C317.4 | Design, Simulate and Extract the layouts of Analog IC Blocks using EDA tools. |

**Course Name: C318 (TECHNICAL SEMINAR)**

**Learners will be able to:**

| | |
|---|---|
| C318.1 | Review, prepare and present technological developments |
| C318.2 | Face the placement interviews |

**Course Name: C319 (PROFESSIONAL COMMUNICATION)**

**Learners will be able to:**

| | |
|---|---|
| C319.1 | Enhance the Employability and Career Skills of students |
| C319.2 | Orient the students towards grooming as a professional |
| C319.3 | Participate confidently in Group Discussions. |
| C319.4 | Develop their confidence and help them attend interviews successfully |
| C319.5 | Make them Employable Graduates |

**Course Name: C401(ANTENNAS AND MICROWAVE ENGINEERING)**

**Students Should be able to:**

| | |
|---|---|
| C401.1 | Apply the basic principles and evaluate antenna parameters and link power budgets |
| C401.2 | To enhance the student knowledge in the area of various antenna designs. |
| C401.3 | Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad band |
| C401.4 | Generation of Microwave signals |
| C401.5 | Design a microwave amplifier given the application specifications |

**Course Name: C402(OPTICAL COMMUNICATION)**

**Students Should be able to:**

| | |
|---|---|
| C402.1 | Realize basic elements in optical fibers, different modes and configurations. |
| C402.2 | Analyze the transmission characteristics associated with dispersion and polarization techniques. |
| C402.3 | Design optical sources and detectors with their use in optical communication system. |
| C402.4 | Construct fiber optic receiver systems, measurements and coupling techniques. |
| C402.5 | Design optical communication systems and its networks |

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**Course Name: C403(EMBEDDED AND REAL TIME SYSTEMS)**
**Students Should be able to:**

| | |
|---|---|
| C403.1 | Describe the architecture and programming of ARM processor |
| C403.2 | Outline the concepts of embedded systems |
| C403.3 | Explain the basic concepts of real time operating system design |
| C403.4 | Model real-time applications using embedded-system concepts |
| C403.5 | Outline of embedded programming and optimization |

**Course Name: C404 (AD HOC AND WIRELESS SENSOR NETWORKS)**
**Students would be able to:**

| | |
|---|---|
| C404.1 | Understand the basics of Ad hoc networks and Wireless Sensor Networks |
| C404.2 | Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement |
| C404.3 | Apply the knowledge to identify appropriate physical and MAC layer protocols |
| C404.4 | Understand the transport layer and security issues possible in Ad hoc and sensor networks. . |
| C404.5 | Familiar with the OS used in Wireless Sensor Networks and build basic modules |

**Course Name: C405(COGNITIVE RADIO)**
**Students Should be able to:**

| | |
|---|---|
| C405.1 | Understand the evolving software defined radio and cognitive radio techniques and their essential functionalities |
| C405.2 | Study the basic architecture and standard for cognitive radio |
| C405.3 | Explain about spectrum sensing and various techniques |
| C405.4 | Analyze the physical, MAC and Network layer design of cognitive radio |
| C405.5 | Expose the student to evolving applications and advanced features of cognitive radio |

**Course Name: C406(ENVIRONMENTAL AND SOCIAL IMPACT)**
**Students Should be able to:**

| | |
|---|---|
| C406.1 | Carry out scoping and screening of developmental projects for environmental and social assessments. |
| C406.2 | Explain different methodologies for environmental impact prediction and assessment. |
| C406.3 | Plan environmental impact assessments and environmental management plans. |
| C406.4 | Evaluate environmental impact assessment reports. |
| C406.5 | Explain the case studies of different |

**Course Name: C407 (EMBEDDED LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C407.1 | Write programs in ARM for a specific Application |
| C407.2 | Interface memory, A/D and D/A convertors with ARM system |
| C407.3 | Analyze the performance of interrupt |
| C407.4 | Write program for interfacing keyboard, display, motor and sensor. |

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| | |
|---|---|
| C407.5 | Formulate a mini project using embedded system |

**Course Name: C408(ADVANCED COMMUNICATION LABORATORY)**
**Students Should be able to:**

| | |
|---|---|
| C408.1 | Understand the working principle of optical sources, detector, fibers |
| C408.2 | Develop understanding of simple optical communication link |
| C408.3 | Understand the measurement of BER, Pulse broadening |
| C408.4 | Understand and capture an experimental approach to digital wireless communication |
| C408.5 | Understand actual communication waveforms that will be sent and received across wireless channel |

**Course Name: C409 (DIGITAL IMAGE PROCESSING)**
**Students Should be able:**

| | |
|---|---|
| C409.1 | To become familiar with digital image fundamentals |
| C409.2 | To get exposed to simple image enhancement techniques in Spatial and Frequency domain. |
| C409.3 | To learn concepts of degradation function and restoration techniques. |
| C409.4 | To study the image segmentation and representation techniques. |
| C409.5 | To become familiar with image compression and recognition methods |

**Course Name: C410 (SATELLITE COMMUNICATION)**
**Students Should be able to:**

| | |
|---|---|
| C410.1 | Analyze the satellite orbits |
| C410.2 | Analyze the earth segment and space segment |
| C410.3 | Analyze the satellite Link design |
| C410.4 | Analyze the various methods of satellite access and coding techniques |
| C410.5 | Design various satellite applications |

**Course Name: C411(PROJECT WORK)**
**Students will be in a position:**

| | |
|---|---|
| C411.1 | To develop the ability to solve a specific problem right from its identification |
| C411.2 | To develop the ability to literature review till the successful solution of the problem |
| C411.3 | To train the students in preparing project reports and to face reviews and viva voce examination. |
| C411.4 | On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology. |

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## DEPARTMENT OF MECHANICAL ENGINEERING

**Anna University Regulation 2017**

**List of course names**

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS8151 | Communicative English |
| 2. | C102 | MA8151 | Engineering Mathematics - I |
| 3. | C103 | PH8151 | Engineering Physics |
| 4. | C104 | CY8151 | Engineering Chemistry |
| 5. | C105 | GE8151 | Problem Solving And Python Programming |
| 6. | C106 | GE8152 | Engineering Graphics |
| 7. | C107 | GE8161 | Problem Solving And Python Programming Laboratory |
| 8. | C108 | BS8161 | Physics And Chemistry Laboratory |
| 9. | C109 | HS8251 | Technical English |
| 10. | C110 | MA8251 | Engineering Mathematics - Ii |
| 11. | C111 | PH8251 | Materials science |
| 12. | C112 | BE8253 | Basic electrical, Electronics And Instrumentation Engineering |
| 13. | C113 | GE8291 | Environmental Science And Engineering |
| 14. | C114 | GE8292 | Engineering Mechanics |
| 15. | C115 | BE8261 | Basic electrical, Electronics And Instrumentation Engineering Laboratory |
| 16. | C116 | GE8261 | Engineering Practices Laboratory |
| 17. | C201 | MA8353 | Transforms and Partial Differential Equations |
| 18. | C202 | ME8391 | Engineering Thermodynamics |
| 19. | C203 | CE8394 | Fluid Mechanics and Machinery |
| 20. | C204 | ME8351 | Manufacturing Technology -I |
| 21. | C205 | EE8353 | Electrical Drives and Controls |
| 22. | C206 | ME8361 | Manufacturing Technology Laboratory – I |
| 23. | C207 | ME8381 | Computer Aided Machine Drawing |
| 24. | C208 | EE8361 | Electrical Engineering Laboratory |
| 25. | C209 | HS8381 | Interpersonal Skills / Listening & Speaking |
| 26. | C210 | MA8452 | Statistics and Numerical Methods |
| 27. | C211 | ME8492 | Kinematics of Machinery |
| 28. | C212 | ME8451 | Manufacturing Technology – II |
| 29. | C213 | ME8491 | Engineering Metallurgy |
| 30. | C214 | CE8395 | Strength of Materials for Mechanical Engineers |

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|---|---|---|---|
| 31. | C215 | ME8493 | Thermal Engineering- I |
| 32. | C216 | ME8462 | Manufacturing Technology Laboratory – II |
| 33. | C217 | CE8381 | Strength of Materials and Fluid Mechanics and Machinery Lab |
| 34. | C218 | HS8461 | Advanced Reading and Writing |
| 35. | C301 | ME8595 | Thermal Engineering- II |
| 36. | C302 | ME8593 | Design of Machine Elements |
| 37. | C303 | ME8501 | Metrology and Measurements |
| 38. | C304 | ME8594 | Dynamics of Machines |
| 39. | C305 | OIM552 | Lean Manufacturing |
| 40. | C306 | ME8511 | Kinematics and Dynamics Laboratory |
| 41. | C307 | ME8512 | Thermal Engineering Laboratory |
| 42. | C308 | ME8513 | Metrology and Measurements Laboratory |
| 43. | C309 | ME8651 | Design of Transmission Systems |
| 44. | C310 | ME8691 | Computer Aided Design and Manufacturing |
| 45. | C311 | ME8693 | Heat and Mass Transfer |
| 46. | C312 | ME8692 | Finite Element Analysis |
| 47. | C313 | ME8694 | Hydraulics and Pneumatics |
| 48. | C314 | PR8592 | Welding Technology |
| 49. | C315 | ME8681 | CAD / CAM Laboratory |
| 50. | C316 | ME8682 | Design and Fabrication Project |
| 51. | C317 | HS8581 | Professional Communication |
| 52. | C401 | ME8792 | Power Plant Engineering |
| 53. | C402 | ME8793 | Process Planning and Cost Estimation |
| 54. | C403 | ME8791 | Mechatronics |
| 55. | C404 | ME8073 | Unconventional Machining Processes |
| 56. | C405 | OML751 | Testing of Materials |
| 57. | C406 | ME8097 | Non Destructive Testing and Evaluation |
| 58. | C407 | ME8711 | Simulation and Analysis Laboratory |
| 59. | C408 | ME8781 | Mechatronics Laboratory |
| 60. | C409 | ME8712 | Technical Seminar |
| 61. | C410 | MG8591 | Principles of Management |
| 62. | C411 | GE8076 | Professional Ethics in Engineering |
| 63. | C412 | ME8811 | Project Work |

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**Course Name: C101 (Communicative English)**

The students will be able to

| | |
|---|---|
| C101.1 | Explain the articles of a general kind in magazines and newspapers. |
| C101.2 | Understand the conversations and short talks delivered in English . |
| C101.3 | Complete the informal conversations effectively. |
| C101.4 | Write short essays of a general kind and personal letters and emails in English. |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 (Engineering Mathematics - I)**

The students will be able to

| | |
|---|---|
| C102.1 | Calculate extreme values of a function |
| C102.2 | Explain the differential calculus for multi variable functions. |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.4 | Estimate the area and volume using integrals |
| C102.5 | Solve higher order linear Ordinary Differential Equations with constant and variable coefficients. |

**Course Name: C103 (Engineering Physics)**

The students will be able to

| | |
|---|---|
| C103.1 | Gain knowledge on the basics of properties of matter and its applications. |
| C103.2 | Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics. |
| C103.3 | Relate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers |
| C103.4 | An ability to identify, formulate and solve problems in quantum mechanics and its applications in tunnelling microscopes |
| C103.5 | Interpret the basics of crystals, their structures and different crystal growth techniques |

**Course Name: C104 (Engineering Chemistry)**

The students will be able to

| | |
|---|---|
| C104.1 | Summarize the water related problems in boilers and their treatment techniques |
| C104.2 | Understanding the basic concepts of surface chemistry and catalysis. |
| C104.3 | Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and the purpose and significance of alloys. |
| C104.4 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |
| C104.5 | Understand about principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills, super capacitors and fuel cells. |

**Course Name: C105 (Problem Solving And Python Programming)**

The students will be able to

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems |
| C105.2 | Understand basic commands of python and write simple Python programs. |
| C105.3 | Develop Python programs with conditional and loops and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, and dictionaries. |

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| | |
|---|---|
| C105.5 | Read and write data from/to files in Python Programs |

**Course Name: C106 (Engineering Graphics)**

The students will be able to

| | |
|---|---|
| C106.1 | Familiarize with the fundamentals and standards of Engineering graphics |
| C106.2 | Perform freehand sketching of basic geometrical constructions and multiple views of objects. |
| C106.3 | Project orthographic projections of lines and plane surfaces. |
| C106.4 | Draw projections and solids and development of surfaces. |
| C106.5 | Visualize and to project isometric and perspective sections of simple solids. |

**Course Name: C107 (Problem Solving And Python Programming Laboratory)**

The students will be able to

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 (Physics And Chemistry Laboratory)**

The students will be able to

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course Name: C109 (Technical English)**

The students will be able to

| | |
|---|---|
| C109.1 | Focus their strategies and skills which enhance their ability to read and comprehend engineering and technology texts. |
| C109.2 | Analyze their ability to Speak appropriately and effectively in varied formal and informal contexts. |
| C109.3 | Prepare effective reports and winning job applications. |
| C109.4 | Make presentations and Participate in Group Discussions. |
| C109.5 | Show their communicative competence in writing and speaking. |

**Course Name: C110 (Engineering Mathematics - II)**

The students will be able to

| | |
|---|---|
| C110.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C110.2 | Estimate the line, surface and volume integral by Green's, Stoke's and Gauss Divergence Theorem. |
| C110.3 | Classify the conformal mapping for different kinds of domain and Milne Thomson method to find analytic functions. |
| C110.4 | Explain the contour integral with an integrand which has singularities in the closed region. |
| C110.5 | Apply the concept of Laplace Transform to the solution of linear Ordinary |

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| | differential equations with constant coefficients. |

**Course Name: C111 (Materials Science)**

The students will be able to

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|---|---|
| C111.1 | Recognize the basic concepts of the various phase diagrams and their applications. |
| C111.2 | Acquire knowledge on Fe-Fe3C phase diagram, various microstructures and alloys. |
| C111.3 | Interpret mechanical properties of materials and their measurement. |
| C111.4 | Gain knowledge on magnetic, dielectric and superconducting properties of materials. |
| C111.5 | Understand the basics of ceramics, composites and nonmaterial's. |

**Course Name: C112 (Basic electrical, Electronics And Instrumentation Engineering)**

The students will be able to

| | |
|---|---|
| C112.1 | Understand the concept of three phase power circuits and measurement. |
| C112.2 | Comprehend the concepts in electrical generators. |
| C112.3 | Comprehend the concepts in electrical motors. |
| C112.4 | Comprehend the concepts in single Phase and three phase Transformer. |
| C112.5 | Choose appropriate measuring instruments for given application |

**Course Name: C113 (Environmental Science And Engineering)**

The students will be able to

| | |
|---|---|
| C113.1 | Understand the importance of Environment, biodiversity, ecosystem and how to solve environmental related problems. |
| C113.2 | Identify and explain about the causes, effect and control measures of air pollution,water pollution, soil pollution, noise pollution, radioactive pollution and thermal pollution with its relevant case studies. |
| C113.3 | Discuss the various renewable and non-renewable resources and energy conservation processes. |
| C113.4 | Explain the social issues and solutions for sustainable environment with relevant Act and case studies. |
| C113.5 | Summarize the impact of human population in the environment and its remedial measures. |

**Course Name: C114 (Engineering Mechanics)**

The students will be able to

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|---|---|
| C114.1 | Illustrate the vectorial and scalar representation of forces and moments |
| C114.2 | Analyse the rigid body in equilibrium |
| C114.3 | Evaluate the properties of surfaces and solid |
| C114.4 | Calculate dynamic forces exerted in rigid body |
| C114.5 | Determine the friction and the effects by the laws of friction |

**Course Name: C115 (Basic Electrical, Electronics And Instrumentation Engineering Laboratory)**

The students will be able to

| | |
|---|---|
| C115.1 | Determine the speed characteristic of different electrical machines |
| C115.2 | Design simple circuits involving diodes and transistors |
| C115.3 | Use operational amplifiers |
| C115.4 | Understand the fundamentals of electronic circuit constructions |
| C115.5 | Understand the function of instruments for electric circuits |

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**Course Name: C116 (Engineering Practices Laboratory)**

The students will be able to

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|---|---|
| C116.1 | Fabricate carpentry components and pipe connections including plumbing works. |
| C116.2 | Use welding equipments to join the structures. |
| C116.3 | Carry out the basic machining operations |
| C116.4 | Make the models using sheet metal works |
| C116.5 | Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings. |

**Course name: C201 (Transforms and Partial Differential Equations)**

The students will be able to

| | |
|---|---|
| C201.1 | Understand how to solve the given standard partial differential equations. |
| C201.2 | Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. |
| C201.3 | Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations. |
| C201.4 | Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. |
| C201.5 | Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems |

**Course name: C202 (Engineering Thermodynamics)**

The students will be able to

| | |
|---|---|
| C202.1 | Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions. |
| C202.2 | Apply second law of thermodynamics to open and closed systems and calculate entropy and availability. |
| C202.3 | Apply Rankine cycle to steam power plant and compare few cycle improvement methods |
| C202.4 | Derive simple thermodynamic relations of ideal and real gases |
| C202.5 | Calculate the properties of gas mixtures and moist air and its use in psychometric processes |

**Course name: C203 (Fluid Mechanics and Machinery)**

The students will be able to

| | |
|---|---|
| C203.1 | Apply mathematical knowledge to predict the properties and characteristics of a fluid. |
| C203.2 | Can analyse and calculate major and minor losses associated with pipe flow in piping networks. |
| C203.3 | Can mathematically predict the nature of physical quantities |
| C203.4 | Can critically analyse the performance of pumps |
| C203.5 | Can critically analyse the performance of turbines |

**Course name: C204 (Manufacturing Technology –I)**

The students will be able to

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|---|---|
| C204.1 | Explain different metal casting processes, associated defects, merits and |

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|---|---|
| | demerits |
| C204.2 | Compare different metal joining processes. |
| C204.3 | Summarize various hot working and cold working methods of metals |
| C204.4 | Explain various sheet metal making processes. |
| C204.5 | Distinguish various components of manufacturing plastics components |

**Course name: C205 (Electrical Drives and Controls)**

The students will be able to

| | |
|---|---|
| C205.1 | Acquire Knowledge about the basics of Electric drives classification and its applications |
| C205.2 | Under the Electrical and mechanical Characteristics of Different types of Electric drives |
| C205.3 | Infer the Knowledge about the Starting methods of AC and DC starters. |
| C205.4 | Clear the basic concepts of the conventional and solid state speed control of DC Drives. |
| C205 .5 | Clear the basic concepts of the conventional and solid state speed control of AC Drives. |

**Course name: C206 (Manufacturing Technology Laboratory – I)**

The students will be able to

| | |
|---|---|
| C206.1 | Demonstrate the safety precautions exercised in the mechanical workshop. |
| C206.2 | Make the work piece as per given shape and size using Lathe |
| C206.3 | Join two metals using arc welding. |
| C206.4 | Use sheet metal fabrication tools and make simple tray and funnel. |
| C206.5 | Use different moulding tools, patterns and prepare sand moulds |

**Course name: C207 (Computer Aided Machine Drawing)**

The students will be able to

| | |
|---|---|
| C207.1 | Understand and interpret drawings of machine components like screw jack, machine vice, tail stock, chuck, vane and gear pump etc. |
| C207.2 | Create the assembly of 2D drawings both manually and using standard CAD packages |
| C207.3 | Create the assembly 3D drawings both manually and using standard CAD packages |
| C207.4 | Re-create part drawings, sectional views and assembly drawings as per standards, Editing, Dimensioning, Layering, Hatching, Block, Array, Detailing, Detailed |
| C207.5 | Understand the drawing standards, Fits and Tolerances |

**Course name: C208 (Electrical Engineering Laboratory)**

The students will be able to

| | |
|---|---|
| C208.1 | Understand the Electrical Characteristics of load test on DC shunt and DC Series motor practically. |
| C208.2 | Acqire knowledge about the speed Control of DC shunt motors and perform the characteristics of DC shunt motor Coupled with the DC shunt generator set. |
| C208.3 | Understand the Concepts to find the efficiency of the Single phase transformer using its load test. |
| C208.4 | Clear the knowledge in the V curves and Inverted V curves characteristics in |

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|---|---|
| | Synchronous Motor Drive. |
| C208.5 | Infer the knowledge of the Characteristics of Single and three phase induction moor using its load test. |

**Course name: C209 (Interpersonal Skills / Listening & Speaking)**

The students will be able to

| | |
|---|---|
| C209.1 | Listen and respond appropriately. |
| C209.2 | Participate in group discussions |
| C209.3 | Make effective presentations |
| C209.4 | Participate confidently and appropriately in conversations both formal and informal |
| C209.5 | Develop the skills for writing technical reports and letters |

**Course name: C210 (Statistics and Numerical Methods)**

The students will be able to

| | |
|---|---|
| C210.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| C210.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture |
| C210.3 | Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. |
| C210.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C210.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications |

**Course name: C211 (Kinematics of Machinery)**

The students will be able to

| | |
|---|---|
| C211.1 | Discuss the basics of mechanism |
| C211.2 | Calculate velocity and acceleration in simple mechanisms |
| C211.3 | Develop CAM profiles |
| C211.4 | Solve problems on gears and gear trains |
| C211.5 | Examine friction in machine elements |

**Course name: C212 (Manufacturing Technology – II)**

The students will be able to

| | |
|---|---|
| C212.1 | Explain the mechanism of metal removal processes |
| C212.2 | Describe the constructional and operational features of centre lathe and other special purpose lathes. |
| C212.3 | Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines. |
| C212.4 | Explain the types of grinding and other super finishing processes apart from gear manufacturing processes. |
| C212.5 | Summarize numerical control of machine tools and write a part program |

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**Course name: C213 (Engineering Metallurgy)**

The students will be able to

| | |
|---|---|
| C213.1 | Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification. |
| C213.2 | Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes. |
| C213.3 | Clarify the effect of alloying elements on ferrous and non-ferrous metals |
| C213.4 | Summarize the properties and applications of non metallic materials. |
| C213.5 | Explain the testing of mechanical properties |

**Course name: C214 (Strength of Materials for Mechanical Engineers)**

The students will be able to

| | |
|---|---|
| C214.1 | Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. |
| C214.2 | Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. |
| C214.3 | Apply basic equation of simple torsion in designing of shafts and helical spring |
| C214.4 | Calculate the slope and deflection in beams using different methods. |
| C214.5 | Analyze and design thin and thick shells for the applied internal and external pressures |

**Course name: C215 (Thermal Engineering- I)**

The students will be able to

| | |
|---|---|
| C215.1 | Apply thermodynamic concepts to different air standard cycles and solve problems |
| C215.2 | Solve problems in single stage and multistage air compressors |
| C215.3 | Explain the functioning and features of IC engines, components and auxiliaries. |
| C215.4 | Calculate performance parameters of IC Engines. |
| C215.5 | Explain the flow in Gas turbines and solve problems |

**Course name: C216 (Manufacturing Technology Laboratory – II)**

The students will be able to

| | |
|---|---|
| C216.1 | Use different machine tools to manufacturing gears |
| C216.2 | Ability to use different machine tools to manufacturing gears. |
| C216.3 | Ability to use different machine tools for finishing operations |
| C216.4 | Ability to manufacture tools using cutter grinder |
| C216.5 | Develop CNC part programming |

**Course name: C217 (Strength of Materials and Fluid Mechanics and Machinery Laboratory)**

The students will be able to

| | |
|---|---|
| C217.1 | Perform Tension test on Solid materials. |
| C217.2 | Perform Torsion test on Solid materials. |
| C217.3 | Perform Hardness test on Solid materials. |
| C217.4 | Perform Compression test on Solid materials. |
| C217.5 | Perform Deformation test on Solid materials. |

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**Course name: C218 (Advanced Reading and Writing)**

The students will be able to

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|---|---|
| C218.1 | Write different types of essays. |
| C218.2 | Write winning job applications. |
| C218.3 | Read and evaluate texts critically. |
| C218.4 | Display critical thinking in various professional contexts. |
| C218.5 | Prepare technical documents like project proposals and statement of purpose. |

**Course name: C301 (Thermal Engineering- II)**

The students will be able to

| | |
|---|---|
| C301.1 | Solve problems in Steam Nozzle |
| C301.2 | Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters. |
| C301.3 | Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems. |
| C301.4 | Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers |
| C301.5 | Solve the problems using refrigerant table/ charts psychometric charts |

**Course name: C302 (Design of Machine Elements)**

The students will be able to

| | |
|---|---|
| C302.1 | Explain the influence of steady and variable stresses in machine component design. |
| C302.2 | Apply the concepts of design to shafts, keys and couplings. |
| C302.3 | Apply the concepts of design to temporary and permanent joints. |
| C302.4 | Apply the concepts of design to energy absorbing members, connecting rod and crank shaft. |
| C302.5 | Apply the concepts of design to bearings |

**Course name: C303 (Metrology and Measurements)**

The students will be able to

| | |
|---|---|
| C303.1 | Describe the concepts of measurements to apply in various metrological instruments |
| C303.2 | Outline the principles of linear and angular measurement tools used for industrial applications |
| C303.3 | Explain the procedure for conducting computer aided inspection |
| C303.4 | Demonstrate the techniques of form measurement used for industrial components |
| C303.5 | Discuss various measuring techniques of mechanical properties in industrial applications |

**Course name: C304 (Dynamics of Machines)**

The students will be able to

| | |
|---|---|
| C304.1 | Calculate static and dynamic forces of mechanisms. |
| C304.2 | Calculate the balancing masses and their locations of reciprocating and rotating masses. CO3 x. |
| C304.3 | Compute the frequency of free vibration. |

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|---|---|
| C304.4 | Compute the frequency of forced vibration and damping coefficient. |
| C304.5 | Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes. |

**Course name: C305 (Lean Manufacturing)**

The students will be able to

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|---|---|
| C305.1 | Identify waste in any process and reduce the waste using LM tools |
| C305.2 | Understand issues & challenges in implementing & developing lean manufacturing techniques from TPM & its contribution for improving organizational performance. |
| C305.3 | Analyze how lean techniques can be applied to manufacturing & service industry |
| C305.4 | Explain the approaches to, concepts and theories Six Sigma. |
| C305.5 | Improve the productivity of the organisation using LM tools. |

**Course name: C306 (Kinematics and Dynamics Laboratory)**

The students will be able to

| | |
|---|---|
| C306.1 | Describe various types of gears, gear trains, kinematic mechanisms, and universal joints |
| C306.2 | Estimate the mass moment of inertia of axisymmetric objects using Turn table apparatus, bi-filar suspension, compound pendulum and natural frequency |
| C306.3 | Inspect the critical speed of shaft under the given load condition and the gyroscopic effect and couple on motorized gyroscope. |
| C306.4 | Sketch the characteristic curves of Watt, Porter, Proell and Hartnell governors and motion curves for the given cam follower setup. |
| C306.5 | Examine the balancing of rotating masses in dynamic balancing machine. |

**Course name: C307 (Thermal Engineering Laboratory)**

The students will be able to

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|---|---|
| C307.1 | Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials. |
| C307.2 | Conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient. |
| C307.3 | Conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity. |
| C307.4 | Conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor. |
| C307.5 | Conduct tests to evaluate the performance of refrigeration and airconditioning test rigs |

**Course name: C308 (Metrology and Measurements Laboratory)**

The students will be able to

| | |
|---|---|
| C308.1 | Inspect the dimensions and the dimensional deviations of given parts. |
| C308.2 | Inspect the dimensions, angularity and parallelism of a given component. |
| C308.3 | Model the torque characteristic curves to various loads at various distances. |
| C308.4 | Inspect the straightness of surfaces and size of irregularities on a machined surface. |
| C308.5 | Measure the vertical distances or height of objects, taper angle of slope for a given |

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| | component, various parameters of threads and gear wheel. |

**Course name: C309 (Design of Transmission Systems)**

The students will be able to

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|---|---|
| C309.1 | Apply the concepts of design to belts, chains and rope drives. |
| C309.2 | Apply the concepts of design to spur, helical gears. |
| C309.3 | Apply the concepts of design to worm and bevel gears. |
| C309.4 | Apply the concepts of design to gear boxes . |
| C309.5 | Apply the concepts of design to cams, brakes and clutches |

**Course name: C310 (Computer Aided Design and Manufacturing)**

The students will be able to

| | |
|---|---|
| C310.1 | Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics |
| C310.2 | Explain the fundamentals of parametric curves, surfaces and Solids |
| C310.3 | Summarize the different types of Standard systems used in CAD |
| C310.4 | Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines. |
| C310.5 | Summarize the different types techniques used in cellular manufacturing and FMS. |

**Course name: C311 (Heat and Mass Transfer)**

The students will be able to

| | |
|---|---|
| C311.1 | Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems |
| C311.2 | Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems |
| C311.3 | Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems |
| C311.4 | Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems |
| C311.5 | Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications |

**Course name: C312 (Finite Element Analysis)**

The students will be able to

| | |
|---|---|
| C312.1 | Summarize the basics of finite element formulation. |
| C312.2 | Apply finite element formulations to solve one dimensional Problems. |
| C312.3 | Apply finite element formulations to solve two dimensional scalar Problems.. |
| C312.4 | Apply finite element method to solve two dimensional Vector problems. |
| C312.5 | Apply finite element method to solve problems on iso parametric element and dynamic Problems |

**Course name: C313 (Hydraulics and Pneumatics)**

The students will be able to

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|---|---|
| C313.1 | Explain the Fluid power and operation of different types of pumps. |

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|---|---|
| C313.2 | Summarize the features and functions of Hydraulic motors, actuators and Flow control valves |
| C313.3 | Explain the different types of Hydraulic circuits and systems |
| C313.4 | Explain the working of different pneumatic circuits and systems |
| C313.5 | Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems. |

**Course name: C314 (Welding Technology)**

The students will be able to

| | |
|---|---|
| C314.1 | Understand the construction and working principles of gas and arc welding process. |
| C314.2 | Understand the construction and working principles of resistance welding process. |
| C314.3 | Understand the construction and working principles of various solid state welding process. |
| C314.4 | Understand the construction and working principles of various special welding processes. |
| C314.5 | Understand the concepts on weld joint design, weldability and testing of weldments. |

**Course name: C315 (CAD / CAM Laboratory)**

The students will be able to

| | |
|---|---|
| C315.1 | Create 3D models using modeling software |
| C315.2 | Understand the CNC control in modern manufacturing system |
| C315.3 | Prepare CNC part programming and perform manufacturing |
| C315.4 | Create the CL Data and Post process generation using CAM packages |
| C315.5 | Apply CAPP in Machining and Turning Centre |

**Course name: C316 (Design and Fabrication Project)**

The students will be able to

| | |
|---|---|
| C316.1 | Design the machine element or the mechanical product. |
| C316.2 | Develop a 3D model of the designed product. |
| C316.3 | Fabricate the machine element or the mechanical product. |
| C316.4 | Demonstrate the working model of the machine element or the mechanical product. |
| C316.5 | Prepare the necessary documents and reports for the final fabricated product |

**Course name: C317 (Professional Communication)**

The students will be able to

| | |
|---|---|
| C317.1 | Make effective presentations |
| C317.2 | Participate confidently in Group Discussions. |
| C317.3 | Attend job interviews and be successful in them. |
| C317.4 | Develop adequate Soft Skills required for the workplace |
| C317.5 | Clarify and prioritize learners' objectives and goals, to contribute and work as a team by creating more leadership opportunities. |

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**Course name: C401 (Power Plant Engineering)**

The students will be able to

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|---|---|
| C401.1 | Explain the layout, construction and working of the components inside a thermal power plant |
| C401.2 | Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants |
| C401.3 | Explain the layout, construction and working of the components inside nuclear power plants. |
| C401.4 | Explain the layout, construction and working of the components inside Renewable energy power plants. |
| C401.5 | Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production. |

**Course name: C402 (Process Planning and Cost Estimation)**

The students will be able to

| | |
|---|---|
| C402.1 | Select the process, equipment and tools for various industrial products. |
| C402.2 | Prepare process planning activity chart. |
| C402.3 | Explain the concept of cost estimation. |
| C402.4 | Compute the job order cost for different type of shop floor. |
| C402.5 | Calculate the machining time for various machining operations. |

**Course name: C403 (Mechatronics)**

The students will be able to

| | |
|---|---|
| C403.1 | Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology. |
| C403.2 | Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller. |
| C403.3 | Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing |
| C403.4 | Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering. |
| C403.5 | Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies. |

**Course name: C404 (Unconventional Machining Processes)**

The students will be able to

| | |
|---|---|
| C404.1 | Explain the need for unconventional machining processes and its classification |
| C404.2 | Compare various thermal energy and electrical energy based unconventional machining processes. |
| C404.3 | Summarize various chemical and electro-chemical energy based unconventional machining processes. |
| C404.4 | Explain various nano abrasives based unconventional machining processes. |
| C404.5 | Distinguish various recent trends based unconventional machining processes. |

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**Course name: C405 (Testing of Materials)**

The students will be able to

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|---|---|
| C405.1 | Identify suitable testing materials, organizations and standards to inspect industrial component |
| C405.2 | Use the different destructive technique and know its applications and limitations |
| C405.3 | Use the different non destructive technique and know its applications and limitations |
| C405.4 | Use the different material characterization testing and know its applications and limitations |
| C405.5 | Use the different Thermal Testing & Chemical Testing and know its applications and limitations |

**Course name: C406 (Non Destructive Testing and Evaluation)**

The students will be able to

| | |
|---|---|
| C406.1 | Explain the fundamental concepts of NDT |
| C406.2 | Discuss the different methods of NDE |
| C406.3 | Explain the concept of Thermography and Eddy current testing |
| C406.4 | Explain the concept of Ultrasonic Testing and Acoustic Emission |
| C406.5 | Explain the concept of Radiography |

**Course name: C407 (Simulation and Analysis Laboratory)**

The students will be able to

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|---|---|
| C407.1 | Simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB. |
| C407.2 | Analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems. |
| C407.3 | Calculate the natural frequency and mode shape analysis of 2D components and beams. |
| C407.4 | Analyze the temperature distribution in one dimensional heat transfer problems (walls and fins). |
| C407.5 | Analyze the temperature distribution in two dimensional heat transfer problems (plates and shell). |

**Course name: C408 (Mechatronics Laboratory)**

The students will be able to

| | |
|---|---|
| C408.1 | Create the program for arithmetic functions and the program for sorting, code conversion functions. |
| C408.2 | Formulate the program codes to interface with traffic light controller and stepper motor. |
| C408.3 | Compare the set speed with actual speed of DC motor by interfacing suitable speed sensors. |
| C408.4 | Integrate all the hydraulic, pneumatic and electro pneumatic circuits by using simulation software. |
| C408.5 | Analyze the real images and template images based on image processing techniques. |

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**Course name: C409 (Technical Seminar)**

The students will be able to

| | |
|---|---|
| C409.1 | Enrich the communication skills of the student. |
| C409.2 | Enrich presentations of technical topics of interest. |
| C409.3 | Review the research articles for understanding of a new field, in the absence of a textbook |
| C409.4 | Improve the technical communication by making an oral presentation before an evaluation committee |
| C409.5 | Cite the reference sources as per research ethics |

**Course name: C410 (Principles of Management)**

The students will be able to

| | |
|---|---|
| C410.1 | Have clear understanding of managerial functions like planning, and have same basic knowledge on international aspect of management |
| C410.2 | Understand the planning process in the organization |
| C410.3 | Understand the concept of organization |
| C410.4 | Demonstrate the ability to directing ,leadership and communicate effectively |
| C410.5 | Analyses isolate issues and formulate best control methods. |

**Course name: C411 (Professional Ethics in Engineering)**

The students will be able to

| | |
|---|---|
| C411.1 | Apply ethics in society |
| C411.2 | Discuss the ethical issues related to engineering |
| C411.3 | Relate the code of ethics to social experimentation |
| C411.4 | Apply safety measures and realize the responsibilities and rights in the society. |
| C411.5 | Acquire knowledge about various roles of engineers in variety of global issues |

**Course name: C412 (Project Work)**

The students will be able to

| | |
|---|---|
| C412.1 | Develop the ability to solve a specific problem right from its identification |
| C412.2 | Develop the ability to literature review till the successful solution of the problem |
| C412.3 | Train the students in preparing project reports and to face reviews and viva voce examination. |
| C412.4 | Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology. |
| C412.5 | Acknowledge the value of continuing education for oneself and to stay up with technology advancements. |

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## DEPARTMENT OF FASHION TECHNOLOGY

### Anna University Regulation 2017

### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS8151 | Communicative English |
| 2. | C102 | MA8151 | Engineering Mathematics - I |
| 3. | C103 | PH8151 | Engineering Physics |
| 4. | C104 | CY8151 | Engineering Chemistry |
| 5. | C105 | GE8151 | Problem Solving and Python Programming |
| 6. | C106 | GE8152 | Engineering Graphics |
| 7. | C107 | GE8161 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS8161 | Physics and Chemistry Laboratory |
| 9. | C109 | HS8251 | Technical English |
| 10. | C110 | MA8251 | Engineering Mathematics - II |
| 11. | C111 | CY8292 | Chemistry for Technologists |
| 12. | C112 | BE8251 | Basic Electrical and Electronics Engineering |
| 13. | C113 | TT8251 | Basics of Textile Technology |
| 14. | C114 | FT8201 | Concepts of Fashion and Design |
| 15. | C115 | CY8261 | Applied Chemistry Laboratory |
| 16. | C116 | GE8261 | Engineering Practices Laboratory |
| 17. | C201 | MA8391 | Probability and Statistics |
| 18. | C202 | FT8301 | Technology of Spinning Processes |
| 19. | C203 | TT8351 | Characteristics of Textile Fibres |
| 20. | C204 | FT8302 | Pattern Engineering I |
| 21. | C205 | FT8303 | Fundamentals of Garment Manufacturing |
| 22. | C206 | FT8304 | Fashion Evolution |
| 23. | C207 | EE8362 | Basic Electrical and Electronics Engineering Laboratory |
| 24. | C208 | FT8311 | Fashion Illustration Laboratory |
| 25. | C209 | FT8312 | Pattern Engineering Laboratory I |
| 26. | C210 | HS8381 | Interpersonal Skills / Listening and Speaking |
| 27. | C211 | FT8401 | Textile Chemical Processing |
| 28. | C212 | FT8402 | Pattern Engineering II |
| 29. | C213 | TT8391 | Engineering Mechanics for Textile Technologists |
| 30. | C214 | FT8403 | Garment Production Machinery |

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| | | | |
|---|---|---|---|
| 31. | C215 | FT8491 | Fabric Manufacturing |
| 32. | C216 | FT8404 | Garment Construction I |
| 33. | C217 | FT8411 | Pattern Engineering Laboratory I |
| 34. | C218 | FT8412 | Garment Construction Laboratory I |
| 35. | C219 | HS8461 | Advanced Reading and Writing |
| 36. | C301 | FT8501 | Garment Construction II |
| 37. | C302 | TT8591 | Woven Fabric Structures |
| 38. | C303 | GE8291 | Environmental Science and Engineering |
| 39. | C304 | FT8002 | Knit Wear Development |
| 40. | C305 | FT8005 | Fashion Photography |
| 41. | C306 | OCE551 | Air Pollution and Control Engineering |
| 42. | C307 | TT8681 | Textile Chemical Processing Laboratory |
| 43. | C308 | FT8511 | Garment Construction Laboratory II |
| 44. | C309 | TT8561 | Fabric Analysis Laboratory |
| 45. | C310 | HS8581 | Professional Communication |
| 46. | C311 | FT8652 | Industrial Engineering in Apparel Industry |
| 47. | C312 | FT8691 | Textile Quality Evaluation |
| 48. | C313 | FT8601 | Apparel Production Planning and Process Control |
| 49. | C314 | FT8651 | Apparel Marketing and Merchandising |
| 50. | C315 | FT8602 | Knit Fabric Production |
| 51. | C316 | FT8611 | Fashion Design Laboratory |
| 52. | C317 | FT8661 | Textile Quality Evaluation Laboratory |
| 53. | C318 | FT8612 | Garment Machinery Laboratory |
| 54. | C401 | FT8701 | Apparel Costing |
| 55. | C402 | FT8702 | Garment Finishing and Clothing Care |
| 56. | C403 | FT8703 | Garment Accessories and Embellishments |
| 57. | C404 | TT8076 | Home Textiles |
| 58. | C405 | FT8711 | Computer Aided Garment Design Laboratory |
| 59. | C406 | FT8712 | Internship |
| 60. | C407 | FT8012 | Fabric Souring and Sampling |
| 61. | C408 | FT8014 | Fashion Portfolio Development |
| 62. | C409 | FT8811 | Project Work |

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**Course Name: C101 (COMMUNICATIVE ENGLISH)**

The students will able to

| | |
|---|---|
| C101.1 | Explain the articles of a general kind in magazines and newspapers. |
| C101.2 | Understand the conversations and short talks delivered in English . |
| C101.3 | Complete the informal conversations effectively. |
| C101.4 | Write short essays of a general kind and personal letters and emails in English. |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 (ENGINEERING MATHEMATICS - I)**

The students will able to

| | |
|---|---|
| C102.1 | Calculate extreme values of a function |
| C102.2 | Explain the differential calculus for multi variable functions. |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.4 | Estimate the area and volume using integrals |
| C102.5 | Solve higher order linear Ordinary Differential Equations with constant and variable coefficients. |

**Course Name: C103 (ENGINEERING PHYSICS)**

The students will able to

| | |
|---|---|
| C103.1 | Gain knowledge on the basics of properties of matter and its applications. |
| C103.2 | Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics. |
| C103.3 | Relate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers |
| C103.4 | An ability to identify, formulate and solve problems in quantum mechanics and its applications in tunnelling microscopes |
| C103.5 | Interpret the basics of crystals, their structures and different crystal growth techniques |

**Course Name: C104 (ENGINEERING CHEMISTRY)**

The students will able to

| | |
|---|---|
| C104.1 | Summarize the water related problems in boilers and their treatment techniques |
| C104.2 | Understanding the basic concepts of surface chemistry and catalysis. |
| C104.3 | Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and the purpose and significance of alloys. |
| C104.4 | Understand the types of fuels, calorific value calculations, and manufacture of solid, liquid and gaseous fuels. |
| C104.5 | Understand about principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills, super capacitors and fuel cells. |

**Course Name: C105 (PROBLEM SOLVING AND PYTHON PROGRAMMING)**

The students will able to

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems |
| C105.2 | Understand basic commands of python and write simple Python programs. |
| C105.3 | Develop Python programs with conditional and loops and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, and dictionaries. |

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| | |
|---|---|
| C105.5 | Read and write data from/to files in Python Programs |

**Course Name: C106 (ENGINEERING GRAPHICS)**

The students will able to

| | |
|---|---|
| C106.1 | Familiarize with the fundamentals and standards of Engineering graphics |
| C106.2 | Perform freehand sketching of basic geometrical constructions and multiple views of objects. |
| C106.3 | Project orthographic projections of lines and plane surfaces. |
| C106.4 | Draw projections and solids and development of surfaces. |
| C106.5 | Visualize and to project isometric and perspective sections of simple solids. |

**Course Name: C107 (PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY)**

The students will able to

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 (PHYSICS AND CHEMISTRY LABORATORY)**

The students will able to

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course Name: C109 (TECHNICAL ENGLISH)**

The students will able to

| | |
|---|---|
| C109.1 | Focus their strategies and skills which enhance their ability to read and comprehend engineering and technology texts. |
| C109.2 | Analyze their ability to Speak appropriately and effectively in varied formal and informal contexts. |
| C109.3 | Prepare effective reports and winning job applications. |
| C109.4 | Make presentations and Participate in Group Discussions. |
| C109.5 | Show their communicative competence in writing and speaking. |

**Course Name: C110 (ENGINEERING MATHEMATICS - II)**

The students will able to

| | |
|---|---|
| C110.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C110.2 | Estimate the line, surface and volume integral by Green's, Stoke's and Gauss Divergence Theorem. |
| C110.3 | Classify the conformal mapping for different kinds of domain and Milne Thomson method to find analytic functions. |
| C110.4 | Explain the contour integral with an integrand which has singularities in the closed region. |
| C110.5 | Apply the concept of Laplace Transform to the solution of linear Ordinary differential equations with constant coefficients. |

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**Course Name: C111 (CHEMISTRY FOR TECHNOLOGISTS)**

The students will able to

| | |
|---|---|
| C111.1 | Gain knowledge on important unit processes. |
| C111.2 | Acquire knowledge about the reaction mechanisms. |
| C111.3 | Acquire knowledge on the concepts of lubricants, oils, fats and soaps. |
| C111.4 | Have the necessary understanding about the auxiliaries employed in textile industries. |
| C111.5 | Understand the classification, synthesis and applications of industrial colorants. |

**COURSE NAME: C112 (BASIC ELECTRICAL AND ELECTRONICS ENGINEERING)**

The students will able to

| | |
|---|---|
| C112.1 | Explain the basic theorems used in Electrical circuits |
| C112.2 | Acquire Knowledge about the different components and function of electrical machines. |
| C112.3 | Explain the fundamentals of semiconductor and applications. |
| C112.4 | Explain the principles of digital electronics |
| C112.5 | Impart knowledge of communication. |

**COURSE NAME: C113 (BASICS OF TEXTILE TECHNOLOGY)**

The students will able to

| | |
|---|---|
| C113.1 | Understand different types of fibres, basics of fibre forming polymer and yarn production |
| C113.2 | Acquaint with the objectives and acquire knowledge of working principles of machinery used for weaving, knitting and non-woven process |
| C113.3 | Understand the objectives and working principles of dyeing, printing and finishing techniques |
| C113.4 | Acquire knowledge on the sequence of process in manufacturing garments |
| C113.5 | Develop knowledge in the selection fibre, yarn and fabric for particular end use in apparel industry |

**Course Name: C114 (CONCEPTS OF FASHION AND DESIGN)**

The students will able to

| | |
|---|---|
| C114.1 | Design patterns and garments using various design concepts |
| C114.2 | Adapt elements and principles of design in context to textiles and apparels |
| C114.3 | Choose suitable color dimensions and categories for textiles and apparels |
| C114.4 | Summarize the dynamics of fashion and the role of fashion designers |

**COURSE NAME: C115 (APPLIED CHEMISTRY LABORATORY)**

The students will able to

| | |
|---|---|
| C115.1 | Analyze the need, design and perform a set of experiments. |
| C115.2 | Differentiate hard and soft water, solve the related numerical problems on water purification and its significance in industry and daily life. |
| C115.3 | Familiarization of a few simple synthetic techniques for soap. |
| C115.4 | Familiarization with equipment like viscometers, flash and fire point apparatus etc. |
| C115.5 | To make the student acquire practical skills in the wet chemical and instrumental methods for quantitative estimation of nitrite in water, cement, oil, coal, Phenol |

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**Course Name: C116 (ENGINEERING PRACTICES LABORATORY)**

The students will able to

| | |
|---|---|
| C116.1 | Fabricate carpentry components and pipe connections including plumbing works. |
| C116.2 | Use welding equipments to join the structures. |
| C116.3 | Carry out the basic machining operations |
| C116.4 | Make the models using sheet metal works |
| C116.5 | Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings. |

**Course Name: C201 (Probability and Statistics)**

The students will able to

| | |
|---|---|
| C201.1 | Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. |
| C201.2 | Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. |
| C201.3 | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| C201.4 | Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control. |
| C201.5 | Have the notion of sampling distributions and statistical techniques used in engineering and management problems. |

**Course Name: C202 (Technology of Spinning Processes)**

The students will able to

| | |
|---|---|
| C202.1 | Understand the sequence process for yarn production |
| C202.2 | Acquires knowledge on principles and machines used for yarn spinning |
| C202.3 | Understand working principles of lap formation |
| C202.4 | Understand the production and applications of fancy yarns |
| C202.5 | Acquires knowledge in new spinning systems |

**Course Name: C203 (Characteristics of Textile Fibres)**

The students will able to

| | |
|---|---|
| C203.1 | Correlate and Choose appropriate fiber for the required property |
| C203.2 | Acquaint with theories of moisture sorption |
| C203.3 | Understand the concepts of fiber tensile characteristics |
| C203.4 | Acquire Knowledge in fiber optical and frictional characteristics and measurement |
| C203.5 | Understand the concepts of fiber thermal characteristics |

**Course Name: C204 (Pattern Engineering I)**

The students will able to

| | |
|---|---|
| C204.1 | Understand human anthropometrics from the scientific and technological viewpoint |
| C204.2 | Define and classify the body dimensions and know the steps involved in taking body measurement |
| C204.3 | Develop knowledge on the tools and techniques involved in pattern making for measuring the body dimensions |
| C204.4 | Prepare the basic block patterns for men's and women's wear based on the principles and methodologies of drafting and draping |
| C204.5 | Apply dart manipulation techniques to design and create variation in garment components |

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**Course Name: C205 (Fundamentals of Garment Manufacturing)**

The students will able to

| | |
|---|---|
| C205.1 | Understand the industry work flow process |
| C205.2 | Able to apply the requirements of spreading, marker planning and cutting |
| C205.3 | Understand the working principles, parts and functions of SNLS machine |
| C205.4 | Acquire knowledge on garment accessories and finishing process involved in garment manufacturing |

**Course Name: C206 (Fashion Evolution)**

The students will able to

| | |
|---|---|
| C206.1 | Obtain knowledge on dynamics of fashion and elements of fashion design. |
| C206.2 | Identify the traditional textiles of India and create patterns and designs. |
| C206.3 | Categorize the traditional western costumes, accessories and embellishments. |
| C206.4 | Identify the African and European traditional costumes, accessories and embellishments. |
| C206.5 | Identify the traditional costumes, accessories and embellishments of Asian countries. |

**Course Name: C207 (Basic Electrical and Electronics Engineering Laboratory)**

The students will able to

| | |
|---|---|
| C207.1 | Understanding the relation between electrical voltage, current and resistance. |
| C207.2 | Ability to measure the performance of electrical machine like DC and AC motors. |
| C207.3 | Visualizing the usage of logic gates and Microprocessor in motor control systems. |

**Course Name: C208 (Fashion Illustration Laboratory)**

The students will able to

| | |
|---|---|
| C208.1 | Draw the still objects using various shading techniques |
| C208.2 | Sketch the men and women ideal figure |
| C208.3 | Illustrate the different poses of human figures |
| C208.4 | Illustrate various garment components, accessories and patterns |
| C208.5 | Design patterns and garments using various drawing techniques and drawing media |

**Course Name: C209 (Pattern Engineering Laboratory I)**

The students will able to

| | |
|---|---|
| C209.1 | Understand the science of measuring human sizes and create pattern from the measurements. |
| C209.2 | Formulate standard measurement chart for men, women and kids. |
| C209.3 | Prepare the basic block patterns for men, women and kids wear based on the principles and methodologies of drafting. |
| C209.4 | Apply dart manipulation techniques to design and create variation in garment components. |
| C209.5 | Evaluate the techniques involved in pattern alteration for various garment designs. |

**Course Name: C210 (Interpersonal Skills / Listening and Speaking)**

The students will able to

| | |
|---|---|
| C210.1 | Equip students with the English language skills required for the successful undertaking of academic studies with primary emphasis on academic speaking and listening skills. |
| C210.2 | Provide guidance and practice in basic general and classroom conversation and to |
| C210.3 | Engage in specific academic speaking activities. |
| C210.4 | Improve general and academic listening skills |
| C210.5 | Make effective presentations. |

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**Course Name: C211 Textile Chemical Processing**

The students will able to

| | |
|---|---|
| C211.1 | Understand the operation sequence in chemical processing. |
| C211.2 | Choose and correlate preparation process of chemical finishing treatment of textile materials. |
| C211.3 | Acquire knowledge on application of dyeing and printing of garments. |
| C211.4 | Able to prepare the dyes preparation. |
| C211.5 | Gain knowledge on Eco friendly chemical processes. |

**Course Name: C212 Pattern Engineering II**

The students will able to

| | |
|---|---|
| C212.1 | Acquire knowledge on patterns for different types of collars and sleeves. |
| C212.2 | Develop knowledge on various styles of pockets and facings. |
| C212.3 | Understand the drafting of patterns for top and bottom wear. |
| C212.4 | Acquaint knowledge on patterns for knits, action wear and swim wear. |
| C212.5 | Acquire knowledge on pattern alterations and grading. |

**Course Name: C213 Engineering Mechanics for Textile Technologists**

The students will able to

| | |
|---|---|
| C213.1 | Illustrate the vectorial and scalar representation of forces and moments. |
| C213.2 | Analyse the rigid body in equilibrium. |
| C213.3 | Evaluate the properties of surfaces and solids. |
| C213.4 | Calculate dynamic forces exerted in rigid body. |
| C213.5 | Determine the friction and the effects by the laws of friction. |

**Course Name: C214 Garment Production Machinery**

The students will able to

| | |
|---|---|
| C214.1 | Able to apply the requirements of fabric spreading and marker planning. |
| C214.2 | Acquire knowledge on the different types of cutting machines and its maintenance. |
| C214.3 | Understand the functions and parts of basic sewing machine and types of needles. |
| C214.4 | Understand the functions and parts of multi thread sewing machines. |

**Course Name: C215 Fabric Manufacturing**

The students will able to

| | |
|---|---|
| C215.1 | Able to gain knowledge on the preparatory process of weaving. |
| C215.2 | Understand the basic concepts of looms and its types. |
| C215.3 | Understand the basic concepts of shuttle less looms and its types. |
| C215.4 | Acquire knowledge on different types of non woven and its production methods. |

**Course Name: C216 Garment Construction I**

The students will able to

| | |
|---|---|
| C216.1 | Describe the basic principles of working of different types of spreading and cutting machineries used in apparel production. |
| C216.2 | Acquire knowledge on types of seams and stitches, sewing threads and its quality. |
| C216.3 | Develop the skills in making of various garment component parts and their variations of tops. |
| C216.4 | Develop the skills in making of men's and woman's wear bottoms. |
| C216.5 | Acquire knowledge on use of accessories for garments. |

**Course Name: C217 Pattern Engineering Laboratory II**

The students will able to

| | |
|---|---|
| C217.1 | Develop patterns for women's, men's and children's garments. |
| C217.2 | Acquire knowledge on grading of patterns. |
| C217.3 | Develop patterns for basic bodice. |

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| | |
|---|---|
| C217.4 | Develop patterns for gored, flared skirts, jeans and jumpsuits. |
| C217.5 | Develop patterns for Sleeve's, collar and neckline. |

**Course Name: C218 Garment Construction Laboratory I**

The students will able to

| | |
|---|---|
| C218.1 | Develop samples using various stitch classes. |
| C218.2 | Develop samples using various seam classes. |
| C218.3 | Develop samples in Button hole and button stitch machine. |
| C218.4 | Develop samples in Feed-of-the-arm machine. |
| C218.5 | Able to construct the various garment components. |

**Course Name: C219 Advanced Reading and Writing**

The students will able to

| | |
|---|---|
| C219.1 | Strengthen the reading skills of students of engineering. |
| C219.2 | Enhance their writing skills with specific reference to technical writing. |
| C219.3 | Develop students' critical thinking skills. |
| C219.4 | Provide more opportunities to develop their project and proposal writing skills. |
| C219.5 | Make effective presentations. |

**Course Name: C301 Garment Construction II**

The students will able to

| | |
|---|---|
| C301.1 | Acquire knowledge on operation breakdown for various men's garments. |
| C301.2 | Acquire knowledge on operation breakdown for various women's garments. |
| C301.3 | Understand different manufacturing systems in apparel production. |
| C301.4 | Acquaint knowledge on inspection and finishing. |

**Course Name: C302 Woven Fabric Structures**

The students will able to

| | |
|---|---|
| C302.1 | Acquire knowledge on structure and design of elementary weaves, its derivatives and loom requirements. |
| C302.2 | Acquire knowledge on structure and weave design of ordinary and brighten honey comb and loom requirements. |
| C302.3 | Acquire knowledge on structure and weave design of bedford cords, extra warp and weft figuring, reversible and non reversible fabrics and loom requirements. |
| C302.4 | Acquire knowledge on structure and weave design of different warp pile and weft pile derivations and loom requirements. |
| C302.5 | Acquaint knowledge on double cloth weave design and its types of stitches. |

**Course Name: C303 Environmental Science and Engineering**

The students will able to

| | |
|---|---|
| C303.1 | Understand importance of environment, structure of ecosystems and biodiversity. |
| C303.2 | Able to gain knowledge on different types of environmental pollutions and prevention of pollutions. |
| C303.3 | Gain knowledge on various forest, mineral and energy resources. |
| C303.4 | Acquire knowledge on social issues and the environment. |
| C303.5 | Gain knowledge on various human pollutions and the environment. |

**Course Name: C304 Knit Wear Development**

The students will able to

| | |
|---|---|
| C304.1 | Select the fabric, accessories and trims for knitted garments |
| C304.2 | Design the garment and acquire skill on construction for children's wear |
| C304.3 | Design the garment and acquire skill on construction for women's wear |

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| | |
|---|---|
| C304.4 | Design the garment and acquire skill on construction for men's wear |
| C304.5 | Design the garment and acquire skill on construction for intimate apparel |

**Course Name: C305 Fashion Photography**

The students will able to

| | |
|---|---|
| C305.1 | To gain knowledge on principles of photography |
| C305.2 | To understand on different types of photography equipments. Photography for different media, printing techniques |
| C305.3 | To acquire knowledge on pphotography for different media and printing techniques |
| C305.4 | To impart knowledge on videography and computer applications in photography |
| C305.5 | To gain knowledge about cameras |

**Course Name: C306 Air Pollution and Control Engineering**

The students will able to

| | |
|---|---|
| C306.1 | Understand the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management. |
| C306.2 | Able to identify, formulate and solve air and noise pollution problems. |
| C306.3 | Able to design stacks and particulate air pollution control devices to meet applicable standards. |
| C306.4 | Will have some basic knowledge on how to select control equipment. |
| C306.5 | Will be able to ensure quality, control and preventive measures. |

**Course Name: C307 Textile Chemical Processing Laboratory**

The students will able to

| | |
|---|---|
| C307.1 | Acquaint knowledge on desizing, scouring and bleaching on cotton fabrics. |
| C307.2 | Able to gain knowledge on identifying dyes for various applications. |
| C307.3 | Acquire knowledge on reactive, vat, disperse dyeing on cotton, polyester and its blends. |
| C307.4 | Acquire knowledge on direct printing styles and its assessments. |
| C307.5 | Acquire knowledge on various fabric finishes and its assessments. |

**Course Name: C308 Garment Construction Laboratory II**

The students will able to

| | |
|---|---|
| C308.1 | Acquaint knowledge on construction of various garments for men top wear. |
| C308.2 | Acquire knowledge on construction of various garments for men bottom wear. |
| C308.3 | Acquaint knowledge on construction of various garments for women top wear. |
| C308.4 | Acquire knowledge on construction of various garments for women bottom wear. |
| C308.5 | Acquaint knowledge on construction of various garments for children. |

**Course Name: C309 Fabric Analysis Laboratory**

The students will able to

| | |
|---|---|
| C309.1 | Construct design, draft and peg plan for elementary weaves, its derivatives. |
| C309.2 | Construct design, draft and peg plan for ordinary and brighten honey comb. |
| C309.3 | Construct design, draft and peg plan for of bedford cords, extra warp and weft figuring and pile fabrics. |
| C309.4 | Construct design, draft and peg plan for double cloth and analysis of jersey fabrics. |
| C309.5 | Acquire knowledge on different fabric blend compositions and finishes on the fabric. |

**Course Name: C310 Professional Communication**

The students will able to

| | |
|---|---|
| C310.1 | Acquire knowledge on soft skills and time management. |

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| | |
|---|---|
| C310.2 | Acquire knowledge on self introduction and its practices. |
| C310.3 | Acquire knowledge on group discussion. |
| C310.4 | Acquire knowledge on interview etiquette. |
| C310.5 | Acquire knowledge on managing stress, networking and career management. |

**Course Name: C311 Industrial Engineering in Apparel Industry**

The students will able to

| | |
|---|---|
| C311.1 | Understand the basics of industrial engineering in apparel industry. |
| C311.2 | Apply method study and its tools for work study. |
| C311.3 | Apply work measurement techniques and its application in apparel industry. |
| C311.4 | Acquaint knowledge on plant layout s and line balancing. |
| C311.5 | Apply statistical process control in apparel production. |

**Course Name: C312 Textile Quality Evaluation**

The students will able to

| | |
|---|---|
| C312.1 | Understand the testing methods for fabric basic constructional characteristics. |
| C312.2 | Acquire knowledge on testing method for fabric strength characteristics. |
| C312.3 | Acquire knowledge on testing methods for fabric comfort and strength characteristics. |
| C312.4 | Acquaint knowledge on testing method for fabric special characteristics. |
| C312.5 | Understand the different types of fabric and garment inspection systems. |

**Course Name: C313 Apparel Production Planning and Process Control**

The students will able to

| | |
|---|---|
| C313.1 | Understand the concepts of product development and production planning. |
| C313.2 | Acquire knowledge on operation of break down and production sequence. |
| C313.3 | Acquire knowledge on cutting room production planning and process control. |
| C313.4 | Acquaint knowledge on factory production planning. |
| C313.5 | Understand the quality control in product development. |

**Course Name: C314 Apparel Marketing and Merchandising**

The students will able to

| | |
|---|---|
| C314.1 | Acquire knowledge on apparel business. |
| C314.2 | Acquire knowledge on different marketing concepts for apparel and textile products. |
| C314.3 | Understand the merchandising concepts in apparel industry. |
| C314.4 | Acquaint knowledge on sourcing. |
| C314.5 | Understand the export documentation and policies. |

**Course Name: C315 Knit Fabric Production**

The students will able to

| | |
|---|---|
| C315.1 | Understand the basics of knitting and classification of knitting process. |
| C315.2 | Develop knowledge on principles of knitting and types of needles. |
| C315.3 | Acquaint knowledge on principles of weft knitting and its structures. |
| C315.4 | Acquaint knowledge on principles of warp knitting and its structures. |

**Course Name: C316 Fashion Design Laboratory**

The students will able to

| | |
|---|---|
| C316.1 | Illustrating men's wear for various seasons using solid colors, stripes, checks and plaids. |
| C316.2 | Designing men's formal, work, casual and party wear for various seasons. |
| C316.3 | Experimenting different types of draping techniques and designs for female dress form. |

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| | |
|---|---|
| C316.4 | Designing women's formal, work, casual, party, bridal, functional and maternity wear for various seasons. |
| C316.5 | Design and develop children's casual wear and uniforms. |

**Course Name: C317 Textile Quality Evaluation Laboratory**

The students will able to

| | |
|---|---|
| C317.1 | Evaluate and determine the fibre characteristics. |
| C317.2 | Evaluate and determine the yarn characteristics. |
| C317.3 | Evaluate and determine the fabric characteristics. |
| C317.4 | Evaluate and determine the fabric abrasion, pilling and air permeability characteristics. |
| C317.5 | Evaluate and determine the seam characteristics. |

**Course Name: C318 Garment Machinery Laboratory**

The students will able to

| | |
|---|---|
| C318.1 | Understand the mechanism, machine settings and produce the samples from Single-Needle Lock Stitch machine. |
| C318.2 | Understand the mechanism, machine settings and produce the samples from Double-Needle Lock Stitch machine. |
| C318.3 | Understand the mechanism, machine settings and produce the samples from Over-lock machine. |
| C318.4 | Understand the mechanism, machine settings and produce the samples from Flat-lock machine. |
| C318.5 | Understand the mechanism, machine settings and produce the samples from Button-holing machine and Feed-off-the-arm machine. |

**Course Name: C401 Apparel Costing**

The students will able to

| | |
|---|---|
| C401.1 | Develop knowledge on cost accounting and cost elements. |
| C401.2 | Analyze cost elements involved in fabric and apparel costing. |
| C401.3 | Prepare working capital management in garment unit. |
| C401.4 | Prepare detailed project report for a garment unit. |

**Course Name: C402 Garment Finishing and Clothing Care**

The students will able to

| | |
|---|---|
| C402.1 | Understand dyeing techniques for apparel products. |
| C402.2 | Acquaint knowledge on laundry equipment and different finishes on garments. |
| C402.3 | Identify garment finishing room equipments for different garments. |
| C402.4 | Understand the principles of laundering in garment finishing. |
| C402.5 | Identify machinery and equipments for garment care. |

**Course Name: C403 Garment Accessories and Embellishments**

The students will able to

| | |
|---|---|
| C403.1 | Understand the different types of accessories used for garments. |
| C403.2 | Ability to evaluate the quality of accessories. |
| C403.3 | Acquire knowledge on different types of embroideries. |
| C403.4 | Acquire knowledge on fashion accessories. |
| C403.5 | Understand the different types of printing. |

**Course Name: C404 Home Textiles**

The students will able to

| | |
|---|---|
| C404.1 | Know about recent developments in home furnishing |
| C404.2 | Understand the different types of floor coverings in home furnishing. |

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| | |
|---|---|
| C404.3 | Understand the different types of curtains and draperies |
| C404.4 | Know about the different styles in living room furnishing |
| C404.5 | Understand the production method of different types of bed linen |

**Course Name: C405 Computer Aided Garment Design Laboratory**

The students will able to

| | |
|---|---|
| C405.1 | Acquaint practical experience on pattern making of men's wears, marker planning and optimization. |
| C405.2 | Acquire practical knowledge on pattern making of women's wears, marker planning and optimization. |
| C405.3 | Acquire practical experience on pattern making of children's dresses, marker planning and optimization. |
| C405.4 | Acquaint practical knowledge on pattern making of dungaree and work wear, marker planning and optimization. |
| C405.5 | Acquaint practical experience on pattern making of close fitting body shapes. |

**Course Name: C406 Internship**

The students will able to

| | |
|---|---|
| C406.1 | Plant layout, machinery, organizational structure and production processes in the firm or research facilities in the laboratory/research institute. |
| C406.2 | Analysis of industrial / research problems and their solutions. |
| C406.3 | Documenting of material specifications, machine and process parameters, testing parameters and results. |
| C406.4 | Preparing of Technical report. |
| C406.5 | Preparing of presentation. |

**Course Name: C407 Fabric Souring and Sampling**

The students will able to

| | |
|---|---|
| C407.1 | Gain knowledge on sample construction. |
| C407.2 | Acquire knowledge on types of sampling. |
| C407.3 | Acquire knowledge about benefits and risks of outsourcing. |
| C407.4 | Understand about raw material sourcing . |
| C407.5 | Understand about concept of sourcing. |

**Course Name: C408 Fashion Portfolio Development**

The students will able to

| | |
|---|---|
| C408.1 | To gain knowledge on development of research methodology. |
| C408.2 | Acquire knowledge on selection of materials. |
| C408.3 | Acquire knowledge about design development elements. |
| C408.4 | Understand about introduction to portfolio building for fashion designers. |
| C408.5 | Understand about garment production, sizing and measurements. |

**Course Name: C409 Project Work**

The students will able to

| | |
|---|---|
| C409.1 | Formulate and analyze problem. |
| C409.2 | Create a new product/ process. |
| C409.3 | Design and conduct experiments to find solution. |
| C409.4 | Analyze the results and provide solution for the identified problem. |
| C409.5 | Prepare project report and make presentation. |

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# ANNA UNIVERSITY

# REGULATIONS – 2021

## DEPARTMENT OF CIVIL ENGINEERING

### Anna University Regulation 2021

### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS3151 | Professional English - I |
| 2. | C102 | MA3151 | Matrices and Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving and Python Programming |
| 6. | C106 | GE3152 | Heritage of Tamils |
| 7. | C107 | GE3171 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS3171 | Physics and Chemistry Laboratory |
| 9. | C109 | GE3172 | English Laboratory |
| 10. | C110 | HS3251 | Professional English - II |
| 11. | C111 | MA3251 | Statistics and NumericalMethods |
| 12. | C112 | PH3201 | Physics for CivilEngineering |
| 13. | C113 | BE3252 | Basic Electrical,Electronics and Instrumentation Engineering |
| 14. | C114 | GE3251 | Engineering Graphics |
| 15. | C115 | GE3252 | Tamils and Technology |
| 16. | C116 | GE3271 | Engineering Practices Laboratory |
| 17. | C117 | BE3272 | Basic Electrical,Electronics and Instrumentation Engineering Laboratory |
| 18. | C118 | GE3272 | Communication Laboratory |
| 19. | C201 | MA3351 | Transforms and Partial Differential Equations |
| 20. | C202 | ME3351 | Engineering mechanics |
| 21. | C203 | CE3301 | Fluid mechanics |
| 22. | C204 | CE3302 | Construction materials and technology |
| 23. | C205 | CE3303 | Water supply and wastewater engineering |
| 24. | C206 | CE3351 | Surveying and levelling |
| 25. | C207 | CE3361 | Surveying and levelling laboratory |
| 26. | C208 | CE3311 | Water and wastewater analysis laboratory |
| 27. | C209 | GE3361 | Professional Development |
| 28. | C210 | CE3401 | Applied hydraulics engineering |
| 29. | C211 | CE3402 | Strength of materials |

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| | | | |
|---|---|---|---|
| 30. | C212 | CE3403 | Concrete technology |
| 31. | C213 | CE3404 | Soil mechanics |
| 32. | C214 | CE3405 | Highway and railway engineering |
| 33. | C215 | GE3451 | Environmental sciences and sustainability |
| 34. | C216 | CE3411 | Hydraulic engineering laboratory |
| 35. | C217 | CE3412 | Materials testing laboratory |
| 36. | C218 | CE3413 | Soil mechanics laboratory |
| 37. | C301 | CE3501 | Design of reinforced cement concrete elements |
| 38. | C302 | CE3502 | Structural analysis I |
| 39. | C303 | CE3503 | Foundation engineering |
| 40. | C304 | CE3013 | Advanced Construction Techniques |
| 41. | C305 | CE3015 | Geo environmental engineering |
| 42. | C306 | CCE331 | Air and Noise Pollution Control Engineering |
| 43. | C307 | MX3084 | Disaster Risk Reduction And Management |
| 44. | C308 | CE3511 | Highway Engineering Laboratory |
| 45. | C309 | CE3512 | Survey Camp |

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**Course name: C101(PROFESSIONAL ENGLISH – I)**

**The students will be able to:**

| | |
|---|---|
| C101.1 | Listen and comprehend complex academic texts |
| C101.2 | Read and infer the denotative and connotative meanings of technical texts |
| C101.3 | Write definitions, descriptions, narrations and essays on various topics |
| C101.4 | Speak fluently and accurately in formal and informal communicative contexts |
| C101.5 | Express their opinions effectively in both oral and written medium of communication |

**Course name: C102 (MATRICES AND CALCULUS)**

**The students will be able to:**

| | |
|---|---|
| C102.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C102.2 | Calculate extreme values of a function |
| C102.3 | Explain the differential calculus for multi variable functions. |
| C102.4 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.5 | Estimate the area and volume using integrals |

**Course name: C103 (ENGINEERING PHYSICS)**

**The students will be able to:**

| | |
|---|---|
| C103.1 | Understand the importance of mechanics |
| C103.2 | Express their knowledge in electromagnetic waves |
| C103.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers |
| C103.4 | Understand the importance of quantum physics |
| C103.5 | Comprehend and apply quantum mechanical principles towards the formation of energy bands |

**Course name: C104 (ENGINEERING CHEMISTRY)**

**The students will be able to:**

| | |
|---|---|
| C104.1 | Inculcate sound understanding of water quality parameters and water treatment techniques. |
| C104.2 | Impart knowledge on the basic principles and preparatory methods of nonmaterial's. |
| C104.3 | Introduce the basic concepts and applications of phase rule and composites. |
| C104.4 | Facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. |
| C104.5 | Familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices. |

**Course name: C105 (PROBLEM SOLVING AND PYTHON PROGRAMMING)**

**The students will be able to:**

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems. |
| C105.2 | Develop and execute simple Python programs. |
| C105.3 | Write simple Python programs using conditionals and looping for solving problems and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, dictionaries etc. |

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| | |
|---|---|
| C105.5 | Read and write data from/to files in Python programs. |

**Course name: C106 (HERITAGE Of TAMILS)**

**The students will be able to:**

| | |
|---|---|
| C106.1 | To gain knowledge on language and literature. |
| C106.2 | To acquire knowledge about heritage - rock art paintings to modern art – sculpture |
| C106.3 | To gain knowledge about folk and martial arts |
| C106.4 | To understand about thinai concept of tamils. |
| C106.5 | To acquire knowledge about contribution of tamils to indian national movement and indian culture |

**Course name: C107 (PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C107.1 | Develop algorithmic solutions to simple computational problems |
| C107.2 | Develop and execute simple Python programs. |
| C107.3 | Implement programs in Python using conditionals and loops for solving problems. |
| C107.4 | Deploy functions to decompose a Python program. |
| C107.5 | Process compound data using Python data structures. |
| C106.6 | Utilize Python packages in developing software applications. |

**Course name: C108 (PHYSICS AND CHEMISTRY LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course name: C109 (ENGLISH LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C109.1 | Listen to and comprehend general as well as complex academic information |
| C109.2 | Listen to and understand different points of view in a discussion |
| C109.3 | Speak fluently and accurately in formal and informal communicative contexts |
| C109.4 | Describe products and processes and explain their uses and purposes clearly and accurately |
| C109.5 | Express their opinions effectively in both formal and informal discussions |

**Course name: C110 (PROFESSIONAL ENGLISH – II)**

**The students will be able to:**

| | |
|---|---|
| C110.1 | Engage learners in meaningful language activities to improve their LSRW skills |
| C110.2 | Enhance learners' awareness of general rules of writing for specific audiences |
| C110.3 | Help learners understand the purpose, audience, contexts of different types of writing |
| C110.4 | Develop analytical thinking skills for problem solving in communicative contexts |

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| | |
|---|---|
| C110.5 | Demonstrate an understanding of job applications and interviews for internship andplacements |

**Course name: C111 (STATISTICS AND NUMERICAL METHODS)**
**The students will be able to:**

| | |
|---|---|
| C111.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems |
| C111.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C111.3 | Appreciate the numerical techniques of interpolation in various intervals and numerical integration for engineering problems |
| C111.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C111.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications |

**Course name: C112 (PHYSICS FOR CIVIL ENGINEERING)**
**The students will be able to:**

| | |
|---|---|
| C112.1 | Acquire knowledge about heat transfer through different materials, thermal performance ofbuilding and thermal insulation. |
| C112.2 | Gain knowledge on the ventilation and air conditioning of buildings |
| C112.3 | Understand the concepts of sound absorption, noise insulation and lighting designs |
| C112.4 | Know about the processing and applications of composites, metallic glasses, shape memoryalloys and ceramics |
| C112.5 | Get an awareness on natural disasters such as earth quake, cyclone, fire and safety measures |

**Course name: C113 (BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING)**
**The students will be able to:**

| | |
|---|---|
| C113.1 | Compute the electric circuit parameters for simple problems |
| C113.2 | Explain the concepts of domestics wiring and protective devices |
| C113.3 | Explain the working principle and applications of electrical machines |
| C113.4 | Analyze the characteristics of analog electronic devices |
| C113.5 | Explain the types and operating principles of sensors and transducers |

**Course name: C114 (ENGINEERING GRAPHICS)**
**The students will be able to:**

| | |
|---|---|
| C114.1 | Use BIS conventions and specifications for engineering drawing. |
| C114.2 | Construct the conic curves, involutes and cycloid. |
| C114.3 | Solve practical problems involving projection of lines. |
| C114.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C114.5 | Draw the development of simple solids. |

**Course name: C115 (TAMILS AND TECHNOLOGY)**
**The students will be able to:**

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|---|---|
| C115.1 | Gain knowledge about weaving and ceramic technology |
| C115.2 | Understand about design and construction technology |

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|---|---|
| C115.3 | Acquire knowledge about manufacturing technology |
| C115.4 | Gain knowledge about agriculture and irrigation technology |
| C115.5 | Acquire knowledge about scientific tamil & tamil computing |

**Course name: C116 (ENGINEERING PRACTICES LABORATORY)**
**The students will be able to:**

| | |
|---|---|
| C116.1 | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. |
| C116.2 | Wire various electrical joints in common household electrical wire work. |
| C116.3 | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. |
| C116.4 | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB. |

**Course name: C117 (BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY)**
**The students will be able to:**

| | |
|---|---|
| C117.1 | Use experimental methods to verify the Ohm's law and Kirchhoff's Law and to measure three phase power |
| C117.2 | Analyze experimentally the load characteristics of electrical machines |
| C117.3 | Analyze the characteristics of basic electronic devices |
| C117.4 | Use LVDT to measure displacement |

**Course name: C118 (COMMUNICATION LABORATORY)**
**The students will be able to:**

| | |
|---|---|
| C118.1 | Speak effectively in group discussions held in a formal/semi formal contexts |
| C118.2 | Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions |
| C118.3 | Write emails, letters and effective job applications. |
| C118.4 | Write critical reports to convey data and information with clarity and precision |
| C118.5 | Give appropriate instructions and recommendations for safe execution of tasks |

**Course Name: C202 (ENGINEERING MECHANICS)**
**The students will be able to:**

| | |
|---|---|
| C202.1 | Students would be able to Illustrate the vectorial and scalar representation of forces and moments |
| C202.2 | Students would be able to Analyse the rigid body in equilibrium |
| C202.3 | Students would be able to Evaluate the properties of distributed forces |
| C202.4 | Students would be able to Determine the friction and the effects by the laws of friction |
| C202.5 | Students would be able to Calculate dynamic forces exerted in rigid body |

**Course Name: C203 (FLUID MECHANICS)**
**The students will be able to:**

| | |
|---|---|
| C203.1 | The student is expected to Demonstrate the difference between solid and fluid, its |

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|---|---|
| | properties and behavior in static conditions. |
| C203.2 | The student is expected to Apply the conservation laws applicable to fluids and its application through fluid kinematics and dynamics. |
| C203.3 | The student is expected to Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performance of prototypes by model studies. |
| C203.4 | The student is expected to Estimate the losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel. |
| C203.5 | The student is expected to Explain the concept of boundary layer and its application to find the drag force excreted by the fluid on the flat solid surface. |

**Course Name: C204 (CONSTRUCTION MATERIALS AND TECHNOLOGY)**

**The students will be able to:**

| | |
|---|---|
| C204.1 | Identify the good quality brick, stone and blocks for construction. |
| C204.2 | Recognize the market forms of timber, steel, aluminum and applications of various composite materials |
| C204.3 | Identify the best construction and service practices such as thermal insulations and air conditioning of the building |
| C204.4 | Select various equipments for construction works conditioning of building |
| C204.5 | Understand the construction planning and scheduling techniques |

**Course Name: C205 (WATER SUPPLY AND WASTEWATER ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C205.1 | Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission |
| C205.2 | Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations |
| C205.3 | Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process |
| C205.4 | Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and seepage disposal methods. |
| C205.5 | Able to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage |

**Course Name: C206 (SURVEYING AND LEVELLING)**

**The students will be able to:**

| | |
|---|---|
| C206.1 | Introduce the rudiments of various surveying and its principles. |
| C206.2 | Imparts knowledge in computation of levels of terrain and ground features |
| C206.3 | Imparts concepts of Theodolite Surveying for complex surveying operations |
| C206.4 | Understand the procedure for establishing horizontal and vertical control |
| C206.5 | Imparts the knowledge on modern surveying instruments |

**Course Name: C207 (SURVEYING AND LEVELLING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C207.1 | Impart knowledge on the usage of basic surveying instruments like chain/tape, compass and levelling instruments |
| C207.2 | Use levelling instrument for surveying operations |
| C207.3 | Use theodolite for various surveying operations |

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|---|---|
| C207.4 | Carry out necessary surveys for social infrastructures |
| C207.5 | Prepare planimetric maps |

**Course Name: C208 (WATER AND WASTEWATER ANALYSIS LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C208.1 | Calibrate and standardize the equipment |
| C208.2 | Collect proper sample for analysis |
| C208.3 | Know the sample preservation methods |
| C208.4 | Perform field oriented testing of water, wastewater |
| C208.5 | Perform coli form analysis |

**Course Name: C209 (PROFESSIONAL DEVELOPMENT)**

**The students will be able to:**

| | |
|---|---|
| C209.1 | Use MS Word to create quality documents, by structuring and organizing content for their day to day technical requirements |
| C209.2 | Use MS Word to create quality documents, by structuring and organizing content for their day to day academic requirements |
| C209.3 | Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding |
| C209.4 | Use MS PowerPoint to create high quality academic presentations by including common tables, charts and graphs |
| C209.5 | Use MS PowerPoint to create high quality academic presentations by interlinking other elements and using media objects. |

**Course Name: C210 (APPLIED HYDRAULICS ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C210.1 | Describe the basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application |
| C210.2 | Analyse steady gradually varied flow, water surface profiles and its length calculation using direct and standard step methods with change in water surface profiles due to change in grades. |
| C210.3 | Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges. |
| C210.4 | Design turbines and explain the working principle |
| C210.5 | Differentiate pumps and explain the working principle with characteristic curves and design centrifugal and reciprocating pumps |

**Course Name: C211 (STRENGTH OF MATERIALS)**

**The students will be able to:**

| | |
|---|---|
| C211.1 | Understand the concepts of stress and strain, principal stresses and principal planes. |
| C211.2 | Determine Shear force and bending moment in beams and understand concept of theory of simple bending. |
| C211.3 | Calculate the deflection of beams by different methods and selection of method for determining slope or deflection. |
| C211.4 | Analyze propped cantilever, fixed beams and continuous beams for external loadings and support settlements. |
| C211.5 | Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and study the various theories of failure |

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**Course Name: C212 (CONCRETE TECHNOLOGY)**

**The students will be able to:**

| | |
|---|---|
| C212.1 | Understand the requirements of cement, aggregates and water for concrete |
| C212.2 | Select suitable admixtures for enhancing the properties of concrete |
| C212.3 | Design concrete mixes as per IS method of mix design |
| C212.4 | Determine the properties of concrete at fresh and hardened state. |
| C212.5 | Know the importance of special concretes for specific requirements |

**Course Name: C213 (SOIL MECHANICS)**

**The students will be able to:**

| | |
|---|---|
| C213.1 | Demonstrate an ability to identify various types of soils and its properties, formulate and solve engineering Problems |
| C213.2 | Show the basic understanding of flow through soil medium and its impact of engineering solution |
| C213.3 | Understand the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation |
| C213.4 | Show the understanding of shear strength of soils and its impact of engineering solutions to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils. |
| C213.5 | Demonstrate an ability to design both finite and infinite slopes, component and process as per needs and specifications. |

**Course Name: C214 (HIGHWAY AND RAILWAY ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C214.1 | Plan a highway according to the principles and standards adopted in various institutions in India |
| C214.2 | Design the geometric features of road network and components of pavement. |
| C214.3 | Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management. |
| C214.4 | Understand the methods of route alignment and design elements in railway planning and constructions. |
| C214.5 | Understand the construction techniques and maintenance of track laying and railway stations |

**Course Name: C215 (ENVIRONMENTAL SCIENCES AND SUSTAINABILITY)**

**The students will be able to:**

| | |
|---|---|
| C215.1 | Recognize and understand the functions of environment, ecosystems and biodiversity and their conservation |
| C215.2 | Identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |
| C215.3 | Identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| C215.4 | Recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |
| C215.5 | Demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization. |

**Course Name: C216 (HYDRAULIC ENGINEERING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C216.1 | Apply Bernoulli equation for calibration of flow measuring devices. |
| C216.2 | Measure friction factor in pipes and compare with Moody diagram |

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| | |
|---|---|
| C216.3 | Determine the performance characteristics of rotodynamic pumps. |
| C216.4 | Determine the performance characteristics of positive displacement pumps |
| C216.5 | Determine the performance characteristics of turbines. |

**Course Name: C217 (MATERIALS TESTING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C217.1 | Determine the mechanical properties of steel. |
| C217.2 | Determine the physical properties of cement |
| C217.3 | Determine the physical properties of fine and coarse aggregate. |
| C217.4 | Determine the workability and compressive strength of concrete. |
| C217.5 | Determine the strength of brick and wood. |

**Course Name: C218 (SOIL MECHANICS LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C218.1 | Conduct tests to determine the index properties of soils |
| C218.2 | Determine the in-situ density and compaction characteristics. |
| C218.3 | Conduct tests to determine the compressibility of soils. |
| C218.4 | Conduct tests to determine the permeability and shear strength of soils |
| C218.5 | Understand the various tests on Geosynthetics. |

**Course Name: C301 (DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS)**

**The students will be able to:**

| | |
|---|---|
| C301.1 | Know the various design concepts and design RC rectangular beams by working stress and limit state methods |
| C301.2 | Understand the design of flanged beams, design for shear and torsion, and anchorage and development length. |
| C301.3 | Design a RC slabs and staircase and draw the reinforcement detailing |
| C301.4 | Design short columns for axial, uni-axial and bi-axial eccentric loadings |
| C301.5 | Design wall footings, isolated footings and combined rectangular footing. |

**Course Name: C302 (STRUCTURAL ANALYSIS I)**

**The students will be able to:**

| | |
|---|---|
| C302.1 | Analyze the pin-jointed plane and space frames. |
| C302.2 | Analyse the continuous beams and rigid frames by slope defection method. |
| C302.3 | Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway. |
| C302.4 | Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method. |
| C302.5 | Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames. |

**Course Name: C303 (FOUNDATION ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C303.1 | Plan and execute a detailed site investigation to select geotechnical design parameters and type of foundation |
| C303.2 | Design shallow foundations, its component or process as per the needs and specifications |
| C303.3 | Design combined footings and raft foundations, its component or process as per the needs and specifications |
| C303.4 | Design deep foundations, its component or process as per the needs and |

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| | |
|---|---|
| | specifications<br>matrix flexibility method. |
| C303.5 | Design retaining walls, its component or process as per the needs and specifications |

**Course Name: C304 (ADVANCED CONSTRUCTION TECHNIQUES)**

**The students will be able to:**

| | |
|---|---|
| C304.1 | Understand the modern construction techniques used in the sub structure construction. |
| C304.2 | Demonstrate knowledge and understanding of the principles and concepts relevant to super structure construction for buildings |
| C304.3 | Understand the concepts used in the construction of special structures |
| C304.4 | Knowledge on Various strengthening and repair methods for different cases. |
| C304.5 | Identify the suitable demolition technique for demolishing a building. |

**Course Name: C305 (GEO ENVIRONMENTAL ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C305.1 | Understand the various causes and consequences of waste interaction with soil and their modification. |
| C305.2 | Understand the various mechanism of transport of contaminants into the subsurface and characterization of contaminated sites and their risk analysis. |
| C305.3 | Understand on how to decontaminate the site so as to reuse the site for human settlement |
| C305.4 | Understand how to safely dispose the waste through different containment process. |
| C305.5 | Expose on how to convert the waste into a resource material through soil waste stabilization techniques with or without chemical stabilization. |

**Course Name: C306 (AIR AND NOISE POLLUTION CONTROL ENGINEERING)**

**The students will be able to:**

| | |
|---|---|
| C306.1 | Understand various types and sources of air pollution and its effects |
| C306.2 | Know the dispersion of air pollutants and their modeling |
| C306.3 | Know about the principles and design of control of particulate pollutants |
| C306.4 | Understand the principles and design of control of gaseous pollutant |
| C306.5 | Know the sources, effects and control of vehicular, indoor air and noise pollution |

**Course Name: C307 (DISASTER RISK REDUCTION AND MANAGEMENT)**

**The students will be able to:**

| | |
|---|---|
| C307.1 | To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR) |
| C307.2 | To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction |
| C307.3 | To develop disaster response skills by adopting relevant tools and technology |
| C307.4 | Enhance awareness of institutional processes for Disaster response in the country |
| C307.5 | Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity |

**Course Name: C308 (HIGHWAY ENGINEERING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C308.1 | Characterize Pavement Aggregate through relevant test. |
| C308.2 | Ascertain the Quality of Bitumen. |
| C308.3 | Determine the Optimum Binder Content Using Marshall Method. |
| C308.4 | Evaluate the Consistency and Properties of Bitumen. |

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| | |
|---|---|
| C308.5 | Determine the Bitumen Content in the Bituminous Mixes |

**Course Name: C309 (HIGHWAY ENGINEERING LABORATORY)**

**The students will be able to:**

| | |
|---|---|
| C309.1 | Handle the modern surveying instruments like Total station and GPS |
| C309.2 | Apply modern surveying techniques in field to establish horizontal control. |
| C309.3 | Understand the surveying techniques in field to establish vertical control |
| C309.4 | Apply different survey adjustment techniques. |
| C309.5 | Carry out different setting out works in the field |

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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**Anna University Regulation 2021**

**List of course names**

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS3151 | Professional English - I |
| 2. | C102 | MA3151 | Matrices and Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving and Python Programming |
| 6. | C106 | GE3152 | Heritage of Tamils |
| 7. | C107 | GE3171 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS3171 | Physics and Chemistry Laboratory |
| 9. | C109 | GE3172 | English Laboratory |
| 10. | C110 | HS3251 | Professional English - II |
| 11. | C111 | MA3251 | Statistics and Numerical Methods |
| 12. | C112 | PH3256 | Physics for Information Science |
| 13. | C113 | BE3251 | Basic Electrical and Electronics Engineering |
| 14. | C114 | GE3251 | Engineering Graphics |
| 15. | C115 | CS3251 | Programming in C |
| 16. | C116 | GE3252 | Tamils and Technology |
| 17. | C117 | GE3271 | Engineering Practices Laboratory |
| 18. | C118 | CS3271 | Programming in C Laboratory |
| 19. | C119 | GE3272 | Communication Laboratory |
| 20. | C201 | MA3354 | Discrete Mathematics |
| 21. | C202 | CS3351 | Digital Principles and Computer Organization |
| 22. | C203 | CS3352 | Foundations of Data Science |
| 23. | C204 | CS3301 | Data Structures |
| 24. | C205 | CS3391 | Object Oriented Programming |
| 25. | C206 | CS3311 | Data Structures Laboratory |

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| | | | |
|---|---|---|---|
| 26. | C207 | CS3381 | Object Oriented Programming Laboratory |
| 27. | C208 | CS3361 | Data Science Laboratory |
| 28. | C209 | GE3361 | Professional Development |
| 29. | C210 | CS3452 | Theory of Computation |
| 30. | C211 | CS3491 | Artificial Intelligence and Machine Learning |
| 31. | C212 | CS3492 | Database Management Systems |
| 32. | C213 | CS3401 | Algorithms |
| 33. | C214 | CS3451 | Introduction to Operating Systems |
| 34. | C215 | GE3451 | Environmental Sciences and Sustainability |
| 35. | C216 | CS3461 | Operating Systems Laboratory |
| 36. | C217 | CS3481 | Database Management Systems Laboratory |
| 37. | C301 | CS3591 | Computer Networks |
| 38. | C302 | CS3501 | Compiler Design |
| 39. | C303 | CB3491 | Cryptography and Cyber Security |
| 40. | C304 | CS3551 | Distributed Computing |
| 41. | C305 | CCS375 | Web Technologies |
| 42. | C306 | CCS336 | Cloud Services Management |

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**Course name: C101 (Professional English – I)**

The students will be able to:

| | |
|---|---|
| C101.1 | Listen and comprehend complex academic texts |
| C101.2 | Read and infer the denotative and connotative meanings of technical texts |
| C101.3 | Write definitions, descriptions, narrations and essays on various topics |
| C101.4 | Speak fluently and accurately in formal and informal communicative contexts |
| C101.5 | Express their opinions effectively in both oral and written medium of communication |

**Course name: C102 (Matrices and Calculus)**

The students will be able to:

| | |
|---|---|
| C102.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C102.2 | Calculate extreme values of a function |
| C102.3 | Explain the differential calculus for multi variable functions. |
| C102.4 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.5 | Estimate the area and volume using integrals |

**Course name: C103 (Engineering Physics)**

The students will be able to:

| | |
|---|---|
| C103.1 | Understand the importance of mechanics |
| C103.2 | Express their knowledge in electromagnetic waves |
| C103.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers |
| C103.4 | Understand the importance of quantum physics |
| C103.5 | Comprehend and apply quantum mechanical principles towards the formation of energy bands |

**Course name: C104 (Engineering Chemistry)**

The students will be able to:

| | |
|---|---|
| C104.1 | Inculcate sound understanding of water quality parameters and water treatment techniques. |
| C104.2 | Impart knowledge on the basic principles and preparatory methods of nonmaterials. |
| C104.3 | Introduce the basic concepts and applications of phase rule and composites. |
| C104.4 | Facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. |
| C104.5 | Familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices. |

**Course name: C105 (Problem Solving andPython Programming)**

The students will be able to:

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems. |
| C105.2 | Develop and execute simple Python program |
| C105.3 | Write simple Python programs using conditionals and looping for solving problems and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, dictionaries etc. |
| C105.5 | Read and write data from/to files in Python programs. |

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**Course name: C106 (Heritage of Tamils)**

The students will be able to:

| | |
|---|---|
| C106.1 | To gain knowledge on language and literature. |
| C106.2 | To acquire knowledge about heritage - rock art paintings to modern art – sculpture |
| C106.3 | To gain knowledge about folk and martial arts |
| C106.4 | To understand about thinai concept of tamils. |
| C106.5 | To acquire knowledge about contribution of tamils to indian national movement and indian culture |

**Course name: C107 (Problem Solving and Python Programming Laboratory)**

The students will be able to:

| | |
|---|---|
| C107.1 | Develop algorithmic solutions to simple computational problems |
| C107.2 | Develop and execute simple Python programs. |
| C107.3 | Implement programs in Python using conditionals and loops for solving problems. |
| C107.4 | Deploy functions to decompose a Python program. |
| C107.5 | Process compound data using Python data structures. |

**Course name: C108 (Physics and Chemistry Laboratory)**

The students will be able to:

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course name: C109 (English Laboratory)**

The students will be able to:

| | |
|---|---|
| C109.1 | Listen to and comprehend general as well as complex academic information |
| C109.2 | Listen to and understand different points of view in a discussion |
| C109.3 | Speak fluently and accurately in formal and informal communicative contexts |
| C109.4 | Describe products and processes and explain their uses and purposes clearly and accurately |
| C109.5 | Express their opinions effectively in both formal and informal discussions |

**Course name: C110 (Professional English – II)**

The students will be able to:

| | |
|---|---|
| C110.1 | Engage learners in meaningful language activities to improve their LSRW skills |
| C110.2 | Enhance learners' awareness of general rules of writing for specific audiences |
| C110.3 | Help learners understand the purpose, audience, contexts of different types of writing |
| C110.4 | Develop analytical thinking skills for problem solving in communicative contexts |
| C110.5 | Demonstrate an understanding of job applications and interviews for internship andplacements |

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**Course name: C111 (Statistics and NumericalMethods)**

The students will be able to:

| | |
|---|---|
| C111.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems |
| C111.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C111.3 | Appreciate the numerical techniques of interpolation in various intervals and numerical integration for engineering problems |
| C111.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C111.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications |

**Course name: C112 (Physics for Information Science)**

The students will be able to:

| | |
|---|---|
| C112.1 | Gain knowledge on classical and quantum electron theories, and energy band structures |
| C112.12 | Acquire knowledge on basics of semiconductor physics and its applications in variousdevices |
| C112.3 | Get knowledge on magnetic properties of materials and their applications in data storage |
| C112.4 | Have the necessary understanding on the functioning of optical materials for optoelectronics |
| C112.5 | Understand the basics of quantum structures and their applications and basics of quantum computing |

**Course name: C113 (Basic Electrical and ElectronicsEngineering)**

The students will be able to:

| | |
|---|---|
| C113.1 | Compute the electric circuit parameters for simple problems |
| C113.2 | Explain the working principle and applications of electrical machines |
| C113.3 | Analyze the characteristics of analog electronic devices |
| C113.5 | Explain the basic concepts of digital electronics |
| C113.5 | Explain the operating principles of measuring instruments |

**Course name: C114 (Engineering Graphics)**

The students will be able to:

| | |
|---|---|
| C114.1 | Use BIS conventions and specifications for engineering drawing |
| C114.2 | Construct the conic curves, involutes and cycloid |
| C114.3 | Construct the conic curves, involutes and cycloid |
| C114.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C114.5 | Draw the development of simple solids |

**Course code: C115 (Programming in C)**

The students will be able to:

| | |
|---|---|
| C115.1 | Demonstrate knowledge on C Programming constructs |
| C115.2 | Develop simple applications in C using basic constructs |
| C115.3 | Design and implement applications using arrays and strings |
| C115.4 | Develop and implement modular applications in C using functions. |
| C115.5 | Develop applications in C using structures and pointers |

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**Course name: C116 (Tamils and Technology)**

The students will be able to:

| | |
|---|---|
| C116.1 | Gain knowledge about weaving and ceramic technology |
| C116.2 | Understand about design and construction technology |
| C116.3 | Acquire knowledge about manufacturing technology |
| C116.4 | Gain knowledge about agriculture and irrigation technology |
| C116.5 | Acquire knowledge about scientific tamil & tamil computing |

**Course code: C117 (Engineering Practices Laboratory)**

The students will be able to:

| | |
|---|---|
| C117.1 | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work |
| C117.2 | Wire various electrical joints in common household electrical wire work. |
| C117.3 | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work |
| C117.4 | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB |

**Course code: C118 (Programming in C Laboratory)**

The students will be able to:

| | |
|---|---|
| C118.1 | Demonstrate knowledge on C programming constructs |
| C118.2 | Develop programs in C using basic constructs |
| C118.3 | Developing program in C using Arrays |
| C118.4 | Develop applications in C using strings, pointers, functions. |
| C118.5 | Develop applications in C using structures |
| C118.6 | Develop applications in C using file processing. |

**Course name: C119 (Communication Laboratory)**

The students will be able to:

| | |
|---|---|
| C119.1 | Speak effectively in group discussions held in a formal/semi formal contexts |
| C119.2 | Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions |
| C119.3 | Write emails, letters and effective job applications. |
| C119.4 | Write critical reports to convey data and information with clarity and precision |
| C119.5 | Give appropriate instructions and recommendations for safe execution of tasks |

**Course Name: C201 (Discrete Mathematics)**

The Students will be able to

| | |
|---|---|
| C201.1 | Have knowledge of the concepts needed to test the logic of a program. |
| C201.2 | Have an understanding in identifying structures on many levels. |
| C201.3 | Be aware of a class of functions which transform a finite set into another finite set which relatesto input and output functions in computer science. |
| C201.4 | Be aware of the counting principles. |
| C201.5 | Be exposed to concepts and properties of algebraic structures such as groups, rings and fields. |

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**Course Name: C202 (Digital Principles and Computer Organization)**

The Students will be able to

| | |
|---|---|
| C202.1 | Design various combinational digital circuits using logic gates |
| C202.2 | Design sequential circuits and analyze the design procedures |
| C202.3 | State the fundamentals of computer systems and analyze the execution of an instruction |
| C202.4 | Analyze different types of control design and identify hazards |
| C202.5 | Identify the characteristics of various memory systems and I/O communication. |

**Course Name: C203 (Foundations of Data Science)**

The Students will be able to

| | |
|---|---|
| C203.1 | Define the data science process |
| C203.2 | Understand different types of data description for data science process |
| C203.3 | Gain knowledge on relationships between data |
| C203.4 | Use the Python Libraries for Data Wrangling |
| C203.5 | Apply visualization Libraries in Python to interpret and explore data |

**Course Name: C204 (Data Structures)**

The Students will be able to

| | |
|---|---|
| C204.1 | Define linear and non-linear data structures. |
| C204.2 | Implement linear and non–linear data structure operations |
| C204.3 | Use appropriate linear/non–linear data structure operations for solving a given problem. |
| C204.4 | Apply appropriate graph algorithms for graph applications. |
| C204.5 | Analyze the various searching and sorting algorithms. |

**Course Name: C205 (Object Oriented Programming)**

The Students will be able to

| | |
|---|---|
| C205.1 | Apply the concepts of classes and objects to solve simple problems |
| C205.2 | Develop programs using inheritance, packages and interfaces |
| C205.3 | Make use of exception handling mechanisms and multithreaded model to solve real world problems |
| C205.4 | Build Java applications with I/O packages, string classes, Collections and generics concepts |
| C205.5 | Integrate the concepts of event handling and Javafx components and controls for developing GUI based applications |

**Course Name: C206 (Data Structures Laboratory)**

The Students will be able to

| | |
|---|---|
| C206.1 | Define linear and non-linear data structures. |
| C206.2 | Implement linear and non–linear data structure operations. |
| C206.3 | Use appropriate linear/non–linear data structure operations for solving a given problem. |
| C206.4 | Apply appropriate graph algorithms for graph applications |
| C206.5 | Analyze the various searching and sorting algorithms. |

**Course Name: C207 (Object Oriented Programming Laboratory)**

The Students will be able to

| | |
|---|---|
| C207.1 | Design and develop Java programs using object oriented programming concepts |

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| | |
|---|---|
| C207.2 | Develop simple applications using object oriented concepts such as package, exceptions |
| C207.3 | Implement multithreading, and generics concepts |
| C207.4 | Create GUIs and event driven programming applications for real world problems |
| C207.5 | Implement and deploy web alications using Java |

**Course Name: C208 (Data Science Laboratory)**

The Students will be able to

| | |
|---|---|
| C208.1 | Make use of the python libraries for data science |
| C208.2 | Make use of the basic Statistical and Probability measures for data science. |
| C208.3 | Perform descriptive analytics on the benchmark data sets. |
| C208.4 | Perform correlation and regression analytics on standard data sets |
| C208.5 | Present and interpret data using visualization packages in Python. |

**Course Name: C210 (Theory of Computation)**

The Students will be able to

| | |
|---|---|
| C210.1 | Understand foundations of computation including automata theory. |
| C210.2 | Construct models of regular expressions and languages. |
| C210.3 | Design context free grammar and push down automata. |
| C210.4 | Understand Turing machines and their capability. |
| C210.5 | Understand Undesirability and NP class problems. |

**Course Name: C211 (Artificial Intelligence and Machine Learning)**

The Students will be able to

| | |
|---|---|
| C211.1 | Use appropriate search algorithms for problem solving |
| C211.2 | Apply reasoning under uncertainty |
| C211.3 | Build supervised learning models |
| C211.4 | Build ensembling and unsupervised models |
| C211.5 | Build deep learning neural network models |

**Course Name: C212 (Database Management Systems)**

The Students will be able to

| | |
|---|---|
| C212.1 | To learn the fundamentals of data models, relational algebra and SQL |
| C212.2 | To represent a database system using ER diagrams and to learn normalization techniques |
| C212.3 | To understand the fundamental concepts of transaction, concurrency and recovery processing |
| C212.4 | understand the internal storage structures using different file and indexing techniques which will help in physical DB design |
| C212.5 | To have an introductory knowledge about the Distributed databases, NOSQL and database security |

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**Course Name: C213 Algorithms**

The Students will be able to

| | |
|---|---|
| C213.1 | Analyze the efficiency of algorithms using various frameworks |
| C213.2 | Apply graph algorithms to solve problems and analyze their efficiency. |
| C213.3 | Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems |
| C213.4 | Use the state space tree method for solving problems |
| C213.5 | Solve problems using approximation algorithms and randomized algorithms |

**Course Name: C214 (Introduction to Operating Systems)**

The Students will be able to

| | |
|---|---|
| C214.1 | Understand the basic concepts and functions of operating systems. |
| C214.2 | Analyze various scheduling algorithms and process synchronization and explain deadlock prevention and avoidance algorithms. |
| C214.3 | Compare and contrast various memory management schemes |
| C214.4 | Explain the functionality of file systems, I/O systems, and Virtualization |
| C214.5 | Compare OS and Android Operating Systems. |

**Course Name: C215 (Environmental Science and Sustainability)**

The Students will be able to

| | |
|---|---|
| C215.1 | To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. |
| C215.2 | To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |
| C215.3 | To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| C215.4 | To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |
| C215.5 | To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization. |

**Course Name: C216 (Operating Systems Laboratory)**

The Students will be able to

| | |
|---|---|
| C216.1 | Define and implement UNIX Commands |
| C216.2 | Compare the performance of various CPU Scheduling Algorithms |
| C216.3 | Compare and contrast various Memory Allocation Methods |
| C216.4 | Define File Organization and File Allocation Strategies. |
| C216.5 | Implement various Disk Scheduling Algorithms |

**Course Name: C217 (Database Management Systems Lab)**

The Students will be able to

| | |
|---|---|
| C217.1 | Create databases with different types of key constraints. |
| C217.2 | Construct simple and complex SQL queries using DML and DCL commands. |
| C217.3 | Use advanced features such as stored procedures and triggers and incorporate in GUI based application development. |

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| | |
|---|---|
| C217.4 | Create an XML database and validate with meta-data (XML schema). |
| C217.5 | Create and manipulate data using NOSQL database. |

**Course Name: C301 (Computer Networks)**

The Students will be able to

| | |
|---|---|
| C301.1 | Explain the basic layers and its functions in computer networks. |
| C301.2 | Understand the basics of how data flows from one node to another. |
| C301.3 | Analyze routing algorithms. |
| C301.4 | Describe protocols for various functions in the network. |
| C301.5 | Analyze the working of various application layer protocols. |

**Course Name: C302 (Compiler Design)**

The Students will be able to

| | |
|---|---|
| C302.1 | Understand the techniques in different phases of a compiler. |
| C302.2 | Design a lexical analyzer for a sample language and learn to use the LEX tool. |
| C302.3 | Apply different parsing algorithms to develop a parser and learn to use YACC tool |
| C302.4 | Understand semantics rules (SDT), intermediate code generation and run-time environment. |
| C302.5 | Implement code generation and apply code optimization techniques. |

**Course Name: C303 (Cryptography and Cyber Security)**

The Students will be able to

| | |
|---|---|
| C303.1 | Understand the fundamentals of networks security, security architecture, threats and vulnerabilities |
| C303.2 | Apply the different cryptographic operations of symmetric cryptographic algorithms |
| C303.3 | Apply the different cryptographic operations of public key cryptography |
| C303.4 | Apply the various Authentication schemes to simulate different applications. |
| C303.5 | Understand various cyber crimes and cyber security. |

**Course Name: C304 (Distributed Computing)**

The Students will be able to

| | |
|---|---|
| C304.1 | Explain the foundations of distributed systems (K2) |
| C304.2 | Solve synchronization and state consistency problems (K3) |
| C304.3 | Use resource sharing techniques in distributed systems (K3) |
| C304.4 | Apply working model of consensus and reliability of distributed systems (K3) |
| C304.5 | Explain the fundamentals of cloud computing (K2) |

**Course Name: C305 (WEB TECHNOLOGIES)**

The Students will be able to

| | |
|---|---|
| C305.1 | Construct a basic website using HTML and Cascading Style Sheets |
| C305.2 | Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms. |
| C305.3 | Develop server side programs using Servlets and JSP. |
| C305.4 | Construct simple web pages in PHP and to represent data in XML format. |
| C305.5 | Develop interactive web applications. |

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**Course Name: C306 (CLOUD SERVICES MANAGEMENT)**

The Students will be able to

| | |
|---|---|
| C306.1 | Exhibit cloud-design skills to build and automate business solutions using cloud technologies. |
| C306.2 | Possess Strong theoretical foundation leading to excellence and excitement towards adoption of cloud-based services |
| C306.3 | Solve the real world problems using Cloud services and technologies |
| C306.4 | Select appropriate structures for designing, deploying and running cloud |
| C306.5 | Illustrate the benefits and drive the adoption of cloud |

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### Anna University Regulation 2021

### List of course names

| S.No | Course Code | Subject Code | Subject Name |
|---|---|---|---|
| 1. | C101 | HS3151 | Professional English-I |
| 2. | C102 | MA3151 | Matrices and Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving and Python Programming |
| 6. | C106 | GE3171 | Problem Solving and Python Programming Laboratory |
| 7. | C107 | BS3171 | Physics and Chemistry Laboratory |
| 8. | C111 | HS3251 | Professional English-II |
| 9. | C112 | MA3251 | Statistics and Numerical Methods |
| 10. | C113 | PH3202 | Physics for Electrical Engineering |
| 11. | C114 | BE3255 | Basic Civil and Mechanical Engineering |
| 12. | C115 | GE3251 | Engineering Graphics |
| 13. | C116 | EE3251 | Electric Circuit Analysis |
| 14. | C117 | GE3271 | Engineering Practices Laboratory |
| 15. | C118 | EE3271 | Electric Circuits Laboratory |
| 16. | C201 | MA3303 | Probability and Complex Functions |
| 17. | C202 | EE3301 | Electromagnetic Field |
| 18. | C203 | EE3302 | Digital Logic Circuits |
| 19. | C204 | EE3303 | Electrical Machines - I |
| 20. | C205 | EC3302 | Electron Devices and Circuits |
| 21. | C206 | CS3353 | C Programming and Data Structures |
| 22. | C207 | EC3311 | Electronic Devices and Circuits Laboratory |
| 23. | C208 | EE3311 | Electrical Machines Laboratory - I |
| 24. | C209 | CS3362 | C Programming and Data Structures Laboratory |
| 25. | C210 | GE3361 | Professional Development |
| 26. | C211 | GE3451 | Environmental Sciences and Sustainability |

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| | | | |
|---|---|---|---|
| 27. | C212 | EE3401 | Transmission and Distribution |
| 28. | C213 | EE3402 | Linear Integrated Circuits |
| 29. | C214 | EE3403 | Measurements and Instrumentation |
| 30. | C215 | EE3404 | Microprocessor and Microcontroller |
| 31. | C216 | EE3405 | Electrical Machines - II |
| 32. | C217 | EE3411 | Electrical Machines Laboratory - II |
| 33. | C218 | EE3412 | Linear and Digital Circuits Laboratory |
| 34. | C219 | EE3413 | Microprocessor and Microcontroller laboratory |
| 35. | C301 | EE3501 | Power System Analysis |
| 36. | C302 | EE3591 | Power Electronics |
| 37. | C303 | EE3503 | Control Systems |
| 38. | C304 | EE3009 | Special Electrical Machines |
| 39. | C305 | EE3017 | Embedded 'C' Programming |
| 40. | C306 | CE1331 | PLC Programming |
| 41. | C307 | MX3083 | Film Appreciation(Mandatory Course) |
| 42. | C308 | EE3511 | Power Electronics laboratory |
| 43. | C309 | EE3512 | Control and Instrumentation laboratory |

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**Course Name: C101 PROFESSIONAL ENGLISH-I**

Students will be able to

| | |
|---|---|
| C101.1 | Listen and comprehend complex academic texts |
| C101.2 | Read and infer the denotative and connotative meanings of technical texts |
| C101.3 | Write definitions, descriptions, narrations and essays on various topics |
| C101.4 | Speak fluently and accurately in formal and informal communicative contexts |
| C101.5 | Express their opinions effectively in both oral and written medium of communication |

**Course Name: C102 MATRICES AND CALCULUS**

Students will be able to

| | |
|---|---|
| C102.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C102.2 | Calculate extreme values of a function |
| C102.3 | Explain the differential calculus for multivariable functions. |
| C102.4 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.5 | Estimate the area and volume using integrals |

**Course Name: C103 ENGINEERING PHYSICS**

Students will be able to

| | |
|---|---|
| C103.1 | Understand the importance of mechanics |
| C103.2 | Express their knowledge in electromagnetic waves |
| C103.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers |
| C103.4 | Understand the importance of quantum physics |
| C103.5 | Comprehend and apply quantum mechanical principles towards the formation of energy bands |

**Course Name: C104 ENGINEERING CHEMISTRY**

Students will be able to

| | |
|---|---|
| C104.1 | Inculcate sound understanding of water quality parameters and water treatment techniques. |
| C104.2 | Impart knowledge on the basic principles and preparatory methods of nano materials. |
| C104.3 | Introduce the basic concepts and applications of phase rule and composites. |
| C104.4 | Facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. |
| C104.5 | Familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices. |

**Course Name: C105 PROBLEM SOLVING AND PYTHON PROGRAMMING**

Students will be able to

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems. |
| C105.2 | Develop and execute simple Python programs. |
| C105.3 | Write simple Python programs using conditionals and looping for solving problems and Decompose a Python program into functions. |
| C105.4 | Represent compound data using Python lists, tuples, dictionaries etc. |
| C105.5 | Read and write data from/to files in Python programs. |

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**Course Name: C106 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY**

Students will be able to

| | |
|---|---|
| C106.1 | Develop algorithmic solutions to simple computational problems |
| C106.2 | Develop and execute simple Python programs. |
| C106.3 | Implement programs in Python using conditionals and loops for solving problems. |
| C106.4 | Deploy functions to decompose a Python program. |
| C106.5 | Process compound data using Python data structures & Utilize Python packages in developing software applications. |

**Course Name: C107 PHYSICS AND CHEMISTRY LABORATORY**

Students will be able to

| | |
|---|---|
| C107.1 | Understand the functioning of various physics laboratory equipment |
| C107.2 | Use graphical models to analyze laboratory data |
| C107.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C107.4 | Access, process and analyze scientific information |
| C107.5 | Solve problems individually and collaboratively |

**Course Name: C111 PROFESSIONAL ENGLISH-II**

Students will be able to

| | |
|---|---|
| C111.1 | Engage learners in meaningful language activities to improve their LSRW skills |
| C111.2 | Enhance learners' awareness of general rules of writing for specific audiences |
| C111.3 | Learners understand the purpose, audience, contexts of different types of writing |
| C111.4 | Develop analytical thinking skills for problem solving in communicative contexts |
| C111.5 | Demonstrate an understanding of job applications and interviews for internship and placements |

**Course Name: C112 STATISTICS AND NUMERICAL METHODS**

Students will be able to

| | |
|---|---|
| C112.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems |
| C112.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C112.3 | Appreciate the numerical techniques of interpolation in various intervals and numerical integration for engineering problems |
| C112.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C112.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications |

**Course Name: C113 PHYSICS FOR ELECTRICAL ENGINEERING**

Students will be able to

| | |
|---|---|
| C113.1 | Know basics of dielectric materials and insulation. |
| C113.2 | Gain knowledge on the electrical and magnetic properties of materials and their applications |
| C113.3 | Understand clearly of semiconductor physics and functioning of semiconductor devices |
| C113.4 | Understand the optical properties of materials and working principles of various optical devices |
| C113.5 | Appreciate the importance of nanotechnology and nano devices. |

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**Course Name: C114 BASIC CIVIL AND MECHANICAL ENGINEERING**

Students will be able to

| | |
|---|---|
| C114.1 | Understanding profession of Civil and Mechanical engineering. |
| C114.2 | Summaries the planning of building, infrastructure and working of Machineries. |
| C114.3 | Apply the knowledge gained in respective discipline |
| C114.4 | Illustrate the ideas of Civil and Mechanical Engineering applications. |
| C114.5 | Appraise the material, Structures, machines and energy. |

**Course Name: C115 ENGINEERING GRAPHICS**

Students will be able to

| | |
|---|---|
| C115.1 | Use BIS conventions and specifications for engineering drawing. |
| C115.2 | Construct the conic curves, involutes and cycloid. |
| C115.3 | Solve practical problems involving projection of lines. |
| C115.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C115.5 | Draw the development of simple solids. |

**Course Name: C116 ELECTRIC CIRCUIT ANALYSIS**

Students will be able to

| | |
|---|---|
| C116.1 | Explain circuit's behavior using circuit laws. |
| C116.2 | Apply mesh analysis/ nodal analysis/ network theorems to determine behavior of the given DC and AC circuit |
| C116.3 | Compute the transient response of first order and second order systems to step and sinusoidal input |
| C116.4 | Compute power, line/ phase voltage and currents of the given three phase circuit |
| C116.5 | Explain the frequency response of series and parallel RLC circuits & behavior of magnetically coupled circuits |

**Course Name: C117 ENGINEERING PRACTICES LABORATORY**

Students will be able to

| | |
|---|---|
| C117.1 | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. |
| C117.2 | Wire various electrical joints in common household electrical wire work. |
| C117.3 | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. |
| C117.4 | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB. |
| C117.5 | Understand the basic knowledge and functioning of various elements in Civil, Electrical, Mechanical and Electronics components |

**Course Name: C118 ELECTRIC CIRCUITS LABORATORY**

Students will be able to

| | |
|---|---|
| C118.1 | Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit |
| C118.2 | Usesimulationandexperimentalmethodstoverifythevariouselectricaltheorems(Super position, Thevenin, Norton and maximum power transfer) for the given DC/AC circuit |
| C118.3 | Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods |

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| | |
|---|---|
| C118.4 | Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods |
| C118.5 | Analyze the performance of the given three-phase circuit using simulation and experimental methods |

**Course Name: C201 PROBABILITY & COMPLEX FUNCTIONS**

Students will be able to

| | |
|---|---|
| C201.1 | Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon |
| C201.2 | Understand the basic concepts of one and two-dimensional random variables and apply in engineering applications |
| C201.3 | Develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property |
| C201.4 | Familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals |
| C201.5 | Acquaint the students with Differential Equations which are significantly used in engineering problems |

**Course Name: C202 ELECTROMAGNETIC FIELD**

Students will be able to

| | |
|---|---|
| C202.1 | Visualize and explain Gradient, Divergence, and Curl operations on electromagnetic vector fields and identify the electromagnetic sources and their effects |
| C202.2 | Compute and analyze electrostatic fields, electric potential, energy density along with their applications |
| C202.3 | Compute and analyze magneto static fields, magnetic flux density, vector potential along with their applications |
| C202.4 | Explain different methods of emf generation and Maxwell's equations |
| C203.5 | Explain the concept of electromagnetic waves and characterizing parameters |

**Course Name: C203 DIGITAL LOGIC CIRCUITS**

Students will be able to

| | |
|---|---|
| C203.1 | Explain various number systems and characteristics of digital logic families |
| C203.2 | Apply K-maps andQuine Mc Cluskey methods to simplify the given Boolean expressions and the implementation of combinational circuit such as multiplexers and demultiplexers - code converters, adders, subtractors, Encoders and Decoders |
| C203.3 | Design various synchronous and asynchronous circuits using Flip Flops |
| C203.4 | Explain asynchronous sequential circuits and programmable logic devices |
| C203.5 | Use VHDL for simulating and testing RTL, combinatorial and sequential circuits |

**Course Name: C204 ELECTRON DEVICES AND CIRCUITS**

Students will be able to

| | |
|---|---|
| C204.1 | Explain the structure and operation of PN junction devices and design different applications circuits using PN junction diodes |
| C204.2 | Analyze the structure and characteristics BJT, FET, MOSFET, UJT, Thyristor and IGBT |
| C204.3 | Analyze the performance of various configurations of BJT and MOSFET based amplifier |
| C204.4 | Explain the characteristics of MOS based cascade and differential amplifier |
| C204.5 | Explain the operation of various feedback amplifiers and oscillators |

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**Course Name: C205 ELECTRICAL MACHINES-I**

Students will be able to

| | |
|---|---|
| C205.1 | Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems |
| C205.2 | Explain the construction and working principle of DC machines and interpret various characteristics of DC machines |
| C205.3 | Compute various performance parameters of the machine, by conducting suitable tests |
| C205.4 | Draw the equivalent circuit of transformer and predetermine the efficiency and regulation |
| C205.5 | Describe the working principle of auto transformer, three phase transformer with different types of connections. |

**Course Name: C206 C PROGRAMMING AND DATA STRUCTURES**

Students will be able to

| | |
|---|---|
| C206.1 | Develop C programs for any real world/technical application |
| C206.2 | Apply advanced features of C in solving problems |
| C206.3 | Write functions to implement linear and non–linear data structure operations |
| C206.4 | Suggest and use appropriate linear/non–linear data structure operations for solving a givenproblem |
| C206.5 | Appropriately use sort and search algorithms for a given application and hash functions that result in a collision free scenario for data storage and retrieval. |

**Course Name: C207ELECTRON DEVICES AND CIRCUITS LABORATORY**

Students will be able to

| | |
|---|---|
| C207.1 | Analyze the characteristics of PN, Zener diode and BJT in CE,CC,CB configurations experimentally |
| C207.2 | Analyze the characteristics of JFET, UJT and FET based differential amplifier experimentally |
| C207.3 | Analyze the characteristics of half-wave, full-wave rectifier with and without Filters, RC phase shift and LC oscillators experimentally |
| C207.4 | Analyze frequency response characteristics of a Common Emitter amplifier and passive filtersexperimentally |
| C207.5 | Calculate the frequency and phase angle using CRO experimentally |

**Course Name: C208 ELECTRICAL MACHINES LABORATORY-I**

Students will be able to

| | |
|---|---|
| C208.1 | Construct the circuit with appropriate connections for the given DC machine/transformer |
| C208.2 | Experimentally determine the characteristics of different types of DC machines and Understand DC motor starters and 3-phase transformer connections |
| C208.3 | Demonstrate the speed control techniques for a DC motor for industrial applications |
| C208.4 | Identify suitable methods for testing of transformer and DC machines |
| C208.5 | Predetermine the performance parameters of transformers and DC motor |

**Course Name: C209C PROGRAMMING AND DATA STRUCTURES LABORATORY**

Students will be able to

| | |
|---|---|
| C209.1 | Use different constructs of C and develop applications |
| C209.2 | Write functions to implement linear and non-linear data structure operations |
| C209.3 | Suggest and use the appropriate linear / non-linear data structure operations for a |

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| | |
|---|---|
| | given problem |
| C209.4 | Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval |
| C209.5 | Implement Sorting and searching algorithms for a given application |

**Course Name: C210 PROFESSIONAL DEVELOPMENT**

Students will be able to

| | |
|---|---|
| C210.1 | Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements |
| C210.2 | Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements |
| C210.3 | Use MS EXCEL to visualize data for ease of understanding |
| C210.4 | Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements |
| C210.5 | Use MS PowerPoint to create high quality academic presentations using media objects |

**Course Name: C211 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY**

Students will be able to

| | |
|---|---|
| C211.1 | Recognize and understand the functions of environment, ecosystems and biodiversity and their conservation |
| C211.2 | Identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society |
| C211.3 | Identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations |
| C211.4 | Recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development |
| C211.5 | Demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization |

**Course Name: C212 TRANSMISSION AND DISTRIBUTION**

Students will be able to

| | |
|---|---|
| C212.1 | Understand the structure of power system, computation of transmission line parameters for different configurations |
| C212.2 | Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance |
| C212.3 | Do Mechanical design of transmission lines, grounding and to understand about the insulators in transmission system |
| C212.4 | Design the underground cables and understand the performance analysis of underground cable |
| C212.5 | Understand the modelling, performance analysis and modern trends in distribution system |

**Course Name: C213 LINEAR INTEGRATED CIRCUITS**

Students will be able to

| | |
|---|---|
| C213.1 | Explain monolithic IC fabrication process and explain the fabrication of diodes, capacitance, resistance, FETs and PV Cell |
| C213.2 | Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp |
| C213.3 | Explain circuit and applications of op-amp based instrumentation amplifier, log/antilog amplifier, analog multiplier /divider, active filters, comparators, |

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| | |
|---|---|
| | waveform generators, A/D and D/A converters |
| C213.4 | Explain Functional blocks, characteristics and applications of Timer, PLL, analog multiplier ICs |
| C213.5 | Explain the applications of ICs in Instrumentation amplifier, fixed and variable voltage regulator, SMPS and function generator |

**Course Name: C214 MEASUREMENTS AND INSTRUMENTATION**

Students will be able to

| | |
|---|---|
| C214.1 | Understand the fundamental art of measurement in engineering. |
| C214.2 | Understand the structural elements of various instruments |
| C214.3 | Understand the importance of bridge circuits |
| C214.4 | Understand about various transducers and their characteristics by experiments |
| C214.5 | Understand the concept of digital instrumentation and virtual instrumentation by experiments |

**Course Name: C215 MICROPROCESSOR AND MICROCONTROLLER**

Students will be able to

| | |
|---|---|
| C215.1 | Write assembly language program for microprocessor and microcontroller |
| C215.2 | Design and implement interfacing of peripheral with microprocessor and microcontroller |
| C215.3 | Analyze, comprehend, design and simulate microprocessor-based systems used for control and monitoring |
| C215.4 | Analyze, comprehend, design and simulate microcontroller-based systems used for control and monitoring |
| C215.5 | Understand and appreciate advanced architecture evolving microprocessor field |

**Course Name: C216 ELECTRICAL MACHINES - II**

Students will be able to

| | |
|---|---|
| C216.1 | Understand the construction and working principle of Synchronous generator |
| C216.2 | Understand the construction and working principle of Synchronous Motor |
| C216.3 | Understand the construction and working principle of Three Phase Induction Motor |
| C216.4 | Acquire knowledge about the starting and speed control of induction motors |
| C216.5 | Gain knowledge about the basic principles and working of Single-phase induction Motors and Special Electrical Machines |

**Course Name: C217 ELECTRICAL MACHINES LABORATORY - II**

Students will be able to

| | |
|---|---|
| C217.1 | Understand and analyze EMF and MMF methods |
| C217.2 | Analyze the characteristics of V and Inverted V curves |
| C217.3 | Acquire hands on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods to understand the importance of Synchronous machines |
| C217.4 | Acquire hands on experience of conducting various tests on induction motors and obtaining their performance indices using standard analytical as well as graphical methods to understand the importance of single and three phase Induction motors |
| C217.5 | Ability to acquire knowledge on separation of losses |

**Course Name: C218 LINEAR AND DIGITAL CIRCUITS LABORATORY**

Students will be able to

| | |
|---|---|
| C218.1 | Understand and implement Boolean Functions |
| C218.2 | Understand the importance of code conversion |
| C218.3 | Design and implement circuits with digital ICs like decoders, multiplexers, register |

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| | |
|---|---|
| C218.4 | Acquire knowledge on Application of Op-Amp |
| C218.5 | Design and implement counters using analog ICs like timers, VCOs and digital ICs like Flip-flops and counters |

**Course Name: C219 MICROPROCESSOR AND MICROCONTROLLER LABORATORY**

Students will be able to

| | |
|---|---|
| C219.1 | Write assembly language program for microprocessor |
| C219.2 | Write assembly language program for microcontroller |
| C219.3 | Design and implement interfacing of peripheral with microprocessor and microcontroller |
| C219.4 | Analyze, comprehend, design and simulate microprocessor-based systems used for control and monitoring |
| C219.5 | Analyze, comprehend, design and simulate microcontroller-based systems used for control and monitoring |

**Course Name: C301 POWER SYSTEM ANALYSIS**

Students will be able to

| | |
|---|---|
| C301.1 | Model the power system under steady state operating condition |
| C301.2 | Carry out power flow analysis using Gauss Seidel and Newton Raphson method |
| C301.3 | Infer the significance of short circuit studies in designing circuit breakers |
| C301.4 | Analyze the state of the power system for various unsymmetrical faults |
| C301.5 | Analyze the stability of power system using different methods |

**Course Name: C302 POWER ELECTRONICS**

Students will be able to

| | |
|---|---|
| C302.1 | Understand the operation of semiconductor devices and dynamic characteristics and to design &analyze the low power SMPS |
| C302.2 | Analyze the various uncontrolled rectifiers and design suitable filter circuits |
| C302.3 | Analyze the operation of the n-pulse converters and evaluate the performance parameters |
| C302.4 | Understand various PWM techniques and apply voltage control and harmonic elimination methods to inverter circuits |
| C302.5 | Understand the operation of AC voltage controllers and its applications |

**Course Name: C303 CONTROL SYSTEMS**

Students will be able to

| | |
|---|---|
| C303.1 | Represent simple systems in transfer function and state variable forms |
| C303.2 | Analyze simple systems in time domain |
| C303.3 | Analyze simple systems in frequency domain |
| C303.4 | Infer the stability of systems in time and frequency domain |
| C303.5 | Interpret characteristics of the system and find out solution for simple control problems |

**Course Name: C304 SPECIAL ELECTRICAL MACHINES**

Students will be able to

| | |
|---|---|
| C304.1 | Model and analyze power electronic systems and equipment using computational software |
| C304.2 | Optimally design magnetics required in special machines based drive systems using FEM based software tools |
| C304.3 | Analyze the dynamic performance of special electrical machines |
| C304.4 | Understand the operation and characteristics of other special electrical machines |

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| | |
|---|---|
| C304.5 | Design and conduct experiments towards research |

**Course Name: C305 EMBEDDED C- PROGRAMMING**

Students will be able to

| | |
|---|---|
| C305.1 | Deliver insight into embedded C programming and its salient features for embedded systems |
| C305.2 | Illustrate the software and hardware architecture for distributed computing in embedded systems |
| C305.3 | Develop a solution for problems by using the concept learned nt in programming using the embedded controllers |
| C305.4 | Develop simple applications with 8051 by using its various features and interfacing with various external hardware |
| C305.5 | Improved Employability and entrepreneurship capacity due to knowledge upgradation on recent trends in embedded programming skills |

**Course Name: C306 PLC PROGRAMMING**

Students will be able to

| | |
|---|---|
| C306.1 | Understand the basics and need for Automation in industries |
| C306.2 | Explain the logic and flow of any particular programming written for a process |
| C306.3 | Apply the knowledge to design or improve an existing program to increase productivity of any process |
| C306.4 | Breakdown SCADA architecture and communication protocols |
| C306.5 | Build and logic in any of the programming languages from IEC- 61131- 3 standard |

**Course Name: C307 FILM APPRECI ATION**

Students will be able to

| | |
|---|---|
| C307.1 | Acquire the knowledge on the component of films |
| C307.2 | Understand the evolution of film language |
| C307.3 | Understand the film theories and criticism/appreciation |
| C307.4 | Understand the development of films |
| C307.5 | Acquire the knowledge on Indian films |

**Course Name: C308 POWER ELECTRONICS LABORATORY**

Students will be able to

| | |
|---|---|
| C308.1 | Determine the characteristics of SCR, IGBT, TRIAC, MOSFET and IGBT |
| C308.2 | Find the transfer characteristics of full converter, semi converter, step up and step-down choppers by simulation experimentation |
| C308.3 | Analyze the voltage waveforms for PWM inverter using various modulation techniques |
| C308.4 | Design and experimentally verify the performance of basic DC/DC converter topologies used for SMPS |
| C308.5 | Understand the performance of AC voltage controllers by simulation and experimentation |

**Course Name: C309 CONTROL AND INSTRUMENTATION LABORATORY**

Students will be able to

| | |
|---|---|
| C309.1 | Model and analyze simple physical systems and simulate the performance in analog and digital platform |
| C309.2 | Design and implement simple controllers in standard forms |
| C309.3 | Design compensators based on time and frequency domain specifications |
| C309.4 | Design a complete closed control loop and evaluate its performance for simple systems |
| C309.5 | Analyze the stability of a physical system in both continuous and discrete domains |

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**Anna University Regulation 2021**

**List of course names**

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS3152 | Professional English - I |
| 2. | C102 | MA3151 | Matrices and Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving and Python Programming |
| 6. | C106 | GE3152 | Heritage of Tamil |
| 7. | C107 | GE3171 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS3171 | Physics and Chemistry Laboratory |
| 9. | C109 | GE3172 | English Laboratory |
| 10. | C110 | HS3252 | Professional English - II |
| 11. | C111 | MA3251 | Statistics and Numerical Methods |
| 12. | C112 | PH3254 | Physics for Electronics Engineering |
| 13. | C113 | BE3254 | Electrical and Instrumentation Engineering |
| 14. | C114 | GE3251 | Engineering Graphics |
| 15. | C115 | EC3251 | Circuit Analysis |
| 16. | C116 | GE3252 | Tamils and Technology |
| 17. | C117 | GE3271 | Engineering Practices Laboratory |
| 18. | C118 | EC3271 | Circuits Analysis Laboratory |
| 19. | C119 | GE3272 | Communication Laboratory / Foreign Language |
| 20. | C201 | MA3355 | Random Processes and Linear Algebra |
| 21. | C202 | CS3353 | C Programming and Data Structures |
| 22. | C203 | EC3354 | Signals and Systems |
| 23. | C204 | EC3353 | Electronic Devices and Circuits |
| 24. | C205 | EC3351 | Control Systems |
| 25. | C206 | EC3352 | Digital Systems Design |
| 26. | C207 | EC3361 | Electronic Devices and Circuits Laboratory |
| 27. | C208 | CS3362 | C Programming and Data Structures Laboratory |
| 28. | C209 | GE3361 | Professional Development |
| 29. | C210 | EC3452 | Electromagnetic Fields |
| 30. | C211 | EC3401 | Networks and Security |
| 31. | C212 | EC3451 | Linear Integrated Circuits |

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| | | | |
|---|---|---|---|
| 32. | C213 | EC3492 | Digital Signal Processing |
| 33. | C214 | EC3491 | Communication Systems |
| 34. | C215 | GE3451 | Environmental Sciences and Sustainability |
| 35. | C216 | EC3461 | Communication Systems Laboratory |
| 36. | C217 | EC3462 | Linear Integrated Circuits Laboratory |
| 37. | C301 | EC3501 | Wireless Communication |
| 38. | C302 | EC3552 | VLSI and Chip Design |
| 39. | C303 | EC3551 | Transmission lines and RF Systems |
| 40. | C304 | CEC366 | Image Processing |
| 41. | C305 | CEC352 | Satellite Communication |
| 42. | C306 | CEC345 | Optical Communication & Networks |
| 43. | C307 | MX3084 | Disaster Risk Reduction and Management |
| 44. | C308 | EC3561 | VLSI Laboratory |
| 45. | C309 | ET3491 | Embedded Systems and IOT Design |
| 46. | C310 | CS3491 | Artificial Intelligence and Machine Learning |
| 47. | C311 | CBM370 | Wearable Devices |
| 48. | C312 | CEC365 | Wireless Sensor Network Design |
| 49. | C313 | CEC348 | Remote Sensing |
| 50. | C314 | MX3089 | Industrial Safety |

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**Course Name: C101 (Professional English - I)**

The students will be able to

| | |
|---|---|
| C101.1 | Use appropriate words in a professional context. |
| C101.2 | Gain understanding of basic grammatic structures and use them in right context. |
| C101.3 | read and infer the denotative and connotative meanings of technical texts |
| C101.4 | write definitions, descriptions, narrations and essays on various topics |
| C101.5 | Make use of standard English to express views coherently and explicitly. |

**Course Name: C102 (Matrices and Calculus)**

The students will be able to

| | |
|---|---|
| C102.1 | Use the matrix algebra methods for solving practical problems. |
| C102.2 | Apply differential calculus tools in solving various application problems. |
| C102.3 | use differential calculus ideas on several variable functions. |
| C102.4 | Apply different methods of integration in solving practical problems. |
| C102.5 | Apply multiple integral ideas in solving areas, volumes and other practical problems. |

**Course Name: C103 (Engineering Physics)**

The students will be able to

| | |
|---|---|
| C103.1 | Understand the importance of mechanics. |
| C103.2 | Express their knowledge in electromagnetic waves. |
| C103.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers. |
| C103.4 | Understand the importance of quantum physics. |
| C103.5 | Comprehend and apply quantum mechanical principles towards the formation of energy bands. |

**Course Name: C104 (Engineering Chemistry)**

The students will be able to

| | |
|---|---|
| C104.1 | infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water. |
| C104.2 | identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications. |
| C104.3 | apply the knowledge of phase rule and composites for material selection requirements. |
| C104.4 | recommend suitable fuels for engineering processes and applications. |
| C104.5 | recognize different forms of energy resources and apply them for suitable applications in energy sectors. |

**Course Name: C105 (Problem Solving And Python Programming)**

The students will be able to

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems. |
| C105.2 | Develop and execute simple Python programs. |
| C105.3 | Write simple Python programs using conditionals and loops for solving problems. |
| C105.4 | Decompose a Python program into functions. |
| C105.5 | Represent compound data using Python lists, tuples, dictionaries etc. and Read and write data from/to files in Python programs. |

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**Course Name: C106 (Heritage of Tamil)**

The students will be able

| | |
|---|---|
| C106.1 | To gain knowledge on language and literature. |
| C106.2 | To acquire knowledge about heritage - rock art paintings to modern art – sculpture |
| C106.3 | To gain knowledge about folk and martial arts |
| C106.4 | To understand about thinai concept of tamils. |
| C106.5 | To acquire knowledge about contribution of tamils to indian national movement and indian culture |

**Course Name: C107 (Problem Solving And Python Programming Laboratory)**

The students will be able to

| | |
|---|---|
| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs step-wise by defining functions and calling them. |
| C107.4 | Use Python lists, tuples, dictionaries for representing compound data |
| C107.5 | Read and write data from/to files in Python. |

**Course Name: C108 (Physics And Chemistry Laboratory)**

The students will be able to

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course Name: C109 (English Laboratory)**

The students will be able

| | |
|---|---|
| C108.1 | To listen to and comprehend general as well as complex academic information |
| C108.2 | To listen to and understand different points of view in a discussion |
| C108.3 | To speak fluently and accurately in formal and informal communicative contexts |
| C108.4 | To describe products and processes and explain their uses and purposes clearly and accurately |
| C108.5 | To express their opinions effectively in both formal and informal discussions |

**Course Name: C110 (Professional English -II )**

The students will be able

| | |
|---|---|
| C110.1 | To compare and contrast products and ideas in technical texts |
| C110.2 | To identify and report cause and effects in events, industrial processes through technical texts |
| C110.3 | To analyse problems in order to arrive at feasible solutions and communicate them in the written format. |
| C110.4 | To present their ideas and opinions in a planned and logical manner |
| C110.5 | To draft effective resumes in the context of job search. |

**Course Name: C111 (Statistics and Numerical Methods)**

The students will be able to

| | |
|---|---|
| C111.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems. |

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| | |
|---|---|
| C111.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C111.3 | Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. |
| C111.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C111.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course Name: C112 (Physics for Electronics Engineering)**

The students will be able to

| | |
|---|---|
| C112.1 | know basics of crystallography and its importance for varied materials properties |
| C112.2 | gain knowledge on the electrical and magnetic properties of materials and their applications |
| C112.3 | understand clearly of semiconductor physics and functioning of semiconductor devices |
| C112.4 | understand the optical properties of materials and working principles of various optical devices |
| C112.5 | appreciate the importance of nanotechnology and nanodevices. |

**Course Name: C113 (Electrical and Instrumentation Engineering)**

The students will be able to

| | |
|---|---|
| C113.1 | Explain the working principle of electrical machines |
| C113.2 | Analyze the output characterizes of electrical machines |
| C113.3 | Choose the appropriate electrical machines for various applications |
| C113.4 | Explain the types and operating principles of measuring instruments |
| C113.5 | Explain the basic power system structure and protection schemes |

**Course Name: C114 (Engineering Graphics)**

The students will be able to

| | |
|---|---|
| C114.1 | Use BIS conventions and specifications for engineering drawing. |
| C114.2 | Construct the conic curves, involutes and cycloid. |
| C114.3 | Solve practical problems involving projection of lines. |
| C114.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C114.5 | Draw the development of simple solids. |

**Course Name: C115 (Circuit Analysis)**

The students will be able to

| | |
|---|---|
| C115.1 | Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits. |
| C115.2 | Apply suitable network theorems and analyze AC and DC circuits |
| C115.3 | Analyze steady state response of any R, L and C circuits |
| C115.4 | Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits. |
| C115.5 | Analyze the coupled circuits and network topologies |

**Course Name: C116 (Tamils and Technology)**

The students will be able to

| | |
|---|---|
| C116.1 | Gain knowledge about weaving and ceramic technology |

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| | |
|---|---|
| C116.2 | Understand about design and construction technology |
| C116.3 | Acquire knowledge about manufacturing technology |
| C116.4 | Gain knowledge about agriculture and irrigation technology |
| C116.5 | Acquire knowledge about scientific tamil & tamil computing |

**Course Name: C117 (Engineering Practices Laboratory)**

The students will be able to

| | |
|---|---|
| C117.1 | Fabricate carpentry components and pipe connections including plumbing works. |
| C117.2 | Use welding equipments to join the structures. |
| C117.3 | Carry out the basic machining operations |
| C117.4 | Make the models using sheet metal works |
| C117.5 | Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings. |

**Course Name: C118 (Circuit Analysis Laboratory)**

The students will be able to

| | |
|---|---|
| C118.1 | Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit |
| C118.2 | Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin , Norton and maximum power transfer) for the given DC/AC circuit |
| C118.3 | Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods |
| C118.4 | Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods |
| C118.5 | Analyze the performance of the given three-phase circuit using simulation and experimental methods |

**Course Name: C119 (Communication Laboratory)**

The students will be able to

| | |
|---|---|
| C119.1 | Speak effectively in group discussions held in formal/semi formal contexts. |
| C119.2 | Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions |
| C119.3 | Write emails, letters and effective job applications. |
| C119.4 | Write critical reports to convey data and information with clarity and precision |
| C119.5 | Give appropriate instructions and recommendations for safe execution of tasks |

**Course Name: C201 (Random Processes and Linear Algebra)**

The students will be able to

| | |
|---|---|
| C201.1 | Explain the fundamental concepts of advanced algebra and their role in modern 38 mathematics and applied contexts |
| C201.2 | Demonstrate accurate and efficient use of advanced algebraic techniques |
| C201.3 | Apply the concept of random processes in engineering disciplines |
| C201.4 | Understand the fundamental concepts of probability with a thorough knowledge of standard distributions that can describe certain real-life phenomenon |
| C201.5 | Understand the basic concepts of one- and two-dimensional random variables and apply them to model engineering problems. |

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**Course Name: C202 (C Programming and Data Structures)**

The students will be able to

| | |
|---|---|
| C202.1 | Develop C programs for any real world/technical application. |
| C202.2 | Apply advanced features of C in solving problems |
| C202.3 | Write functions to implement linear and non–linear data structure operations. |
| C202.4 | Suggest and use appropriate linear/non–linear data structure operations for solving a given problem. |
| C202.5 | Appropriately use sort and search algorithms for a given application |
| C202.6 | Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval. |

**Course Name: C203 (Signals And Systems)**

The students will be able to

| | |
|---|---|
| C203.1 | determine if a given system is linear/causal/stable |
| C203.2 | determine the frequency components present in a deterministic signal |
| C203.3 | characterize continuous LTI systems in the time domain and frequency domain |
| C203.4 | characterize discrete LTI systems in the time domain and frequency domain |
| C203.5 | compute the output of an LTI system in the time and frequency domains |

**Course Name: C204 (Electronic Devices And Circuits)**

The students will be able to

| | |
|---|---|
| C204.1 | Explain the structure and working operation of basic electronic devices |
| C204.2 | Design and analyze amplifiers |
| C204.3 | Analyze frequency response of BJT and MOSFET amplifiers |
| C204.4 | Design and analyze feedback amplifiers and oscillator principles |
| C204.5 | Design and analyze power amplifiers and supply circuits |

**Course Name: C205 (Control Systems)**

The students will be able to

| | |
|---|---|
| C205.1 | Compute the transfer function of different physical systems |
| C205.2 | Analyse the time domain specification and calculate the steady state error |
| C205.3 | Illustrate the frequency response characteristics of open loop and closed loop system response. |
| C205.4 | Analyse the stability using Routh and root locus techniques. |
| C205.5 | Illustrate the state space model of a physical system and discuss the concepts of sampled data control system. |

**Course Name: C206 (Digital Systems Design)**

The students will be able to

| | |
|---|---|
| C206.1 | Use Boolean algebra and simplification procedures relevant to digital logic. |
| C206.2 | Design various combinational digital circuits using logic gates. |
| C206.3 | Analyse and design synchronous sequential circuits. |
| C206.4 | Analyse and design asynchronous sequential circuits |
| C206.5 | Build logic gates and use programmable devices |

**Course Name: C207 (Electronic Devices And Circuits Laboratory)**

The students will be able to

| | |
|---|---|
| C207.1 | Characteristics of PN Junction Diode |
| C207.2 | Characteristics of Zener diode and regulator |
| C207.3 | Design and Testing of BJT amplifiers |

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| | |
|---|---|
| C207.4 | Design and Testing of MOSFET amplifiers |
| C207.5 | Operation of power amplifiers |

**Course Name: C208 (C Programming And Data Structures Laboratory)**

The students will be able to

| | |
|---|---|
| C208.1 | Use different constructs of C and develop applications |
| C208.2 | Write functions to implement linear and non-linear data structure operations |
| C208.3 | Suggest and use the appropriate linear / non-linear data structure operations for a given problem |
| C208.4 | Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval |
| C208.5 | Implement Sorting and searching algorithms for a given application |

**Course Name: C209 (Professional Development)**

The students will be able to

| | |
|---|---|
| C209.1 | Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements |
| C209.2 | Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements. |
| C209.3 | Use MS EXCEL to visualize data for ease of understanding |
| C209.4 | Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements. |
| C209.5 | Use MS PowerPoint to create high quality academic presentations by using media objects |

**Course Name: C210 (Electromagnetic Fields)**

The students will be able to

| | |
|---|---|
| C210.1 | Relate the fundamentals of vector, coordinate system to electromagnetic concepts |
| C210.2 | Analyze the characteristics of Electrostatic field and Interpret the concepts of Electric field in material space and solve the boundary conditions |
| C210.3 | Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions. |
| C210.4 | Determine the significance of time varying fields |
| C210.5 | Investigate behavior of EM waves in Plane surface and boundary conditions |

**Course Name: C211 (Networks And Security)**

The students will be able to

| | |
|---|---|
| C211.1 | Explain the Network Models, layers and functions |
| C211.2 | Categorize and classify the routing protocols |
| C211.3 | List the functions of the transport and application layer. |
| C211.4 | Evaluate and choose the network security mechanisms. |
| C211.5 | Discuss the hardware security attacks and countermeasures. |

**Course Name: C212 (Linear Integrated Circuits)**

The students will be able to

| | |
|---|---|
| C212.1 | Design linear and non linear applications of op – amps. |
| C212.2 | Design applications using analog multiplier and PLL. |
| C212.3 | Design ADC and DAC using op – amps. |
| C212.4 | Generate waveforms using op – amp circuits. |
| C212.5 | Analyze special functions ICs |

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**Course Name: C213 (Digital Signal Processing)**

The students will be able to

| | |
|---|---|
| C213.1 | Apply DFT for the analysis of digital signals and systems |
| C213.2 | Design IIR and FIR filters |
| C213.3 | Characterize the effects of finite precision representation on digital filters |
| C213.4 | Design multirate filters |
| C213.5 | Apply adaptive filters appropriately in communication systems |

**Course Name: C214 (Communication Systems)**

The students will be able to

| | |
|---|---|
| C214.1 | Gain knowledge in amplitude modulation techniques |
| C214.2 | Understand the concepts of Random Process to the design of communication systems |
| C214.3 | Gain knowledge in digital techniques |
| C214.4 | Gain knowledge in sampling and quantization |
| C214.5 | Understand the importance of demodulation techniques |

**Course Name: C215 (Environmental Sciences And Sustainability)**

The students will be able to

| | |
|---|---|
| C215.1 | Gain Knowledge about environment and Ecosystems. |
| C215.2 | Aware Students about problems of environmental pollutions, its impact on human and ecosystems and control measures. |
| C215.3 | Understand the types of energy resource and how to handle. |
| C215.4 | Concepts and Importance of sustainability and EIA |
| C215.5 | Assimilate the concept of sustainability for future. |

**Course Name: C216 (Communication Systems Laboratory Laboratory)**

The students will be able to

| | |
|---|---|
| C216.1 | Design AM, FM & Digital Modulators for specific applications. |
| C216.2 | Compute the sampling frequency for digital modulation. |
| C216.3 | Simulate & validate the various functional modules of Communication system. |
| C216.4 | Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes |
| C216.5 | Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of Communication system |

**Course Name: C217 (Linear Integrated Circuits Laboratory)**

The students will be able to

| | |
|---|---|
| C217.1 | Analyze various types of feedback amplifiers |
| C217.2 | Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators |
| C217.3 | Design and simulate feedback amplifiers,oscillators, tuned amplifiers, waveshaping circuits and multivibrators, filters using SPICE Tool. |
| C217.4 | Design amplifiers, oscillators, D-A converters using operational amplifiers |
| C217.5 | Design filters using op-amp and perform an experiment on frequency response |

**Course Name: C218 (Linear Integrated Circuits Laboratory)**

The students will be able to

| | |
|---|---|
| C217.1 | Analyze various types of feedback amplifiers |
| C217.2 | Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators |
| C217.3 | Design and simulate feedback amplifiers,oscillators, tuned amplifiers, waveshaping |

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| | |
|---|---|
| | circuits and multivibrators, filters using SPICE Tool. |
| C217.4 | Design amplifiers, oscillators, D-A converters using operational amplifiers |
| C217.5 | Design filters using op-amp and perform an experiment on frequency response |

**Course Name: C301 (Wireless Communication)**

The students will be able to

| | |
|---|---|
| C301.1 | Understand The Concept And Design Of A Cellular System. |
| C301.2 | Understand Mobile Radio Propagation And Various Digital Modulation Techniques. |
| C301.3 | Understand The Concepts Of Multiple Access Techniques And Wireless Networks |
| C301.4 | Characterize a wireless channel and evolve the system design specifications |
| C301.5 | Design a cellular system based on resource availability and traffic demands. |

**Course Name: C302 (VLSI and Chip Design)**

The students will be able to

| | |
|---|---|
| C302.1 | In depth knowledge of MOS technology |
| C302.2 | Understand Combinational Logic Circuits and Design Principles |
| C302.3 | Understand Sequential Logic Circuits and Clocking Strategies |
| C302.4 | Understand Memory architecture and building blocks |
| C302.5 | Understand the ASIC Design Process and Testing. |

**Course Name: C303 (Transmission Lines and RF Systems)**

The students will be able to

| | |
|---|---|
| C303.1 | Explain the characteristics of transmission lines and its losses. |
| C303.2 | Calculate the standing wave ratio and input impedance in high frequency transmission lines. |
| C303.3 | Analyze impedance matching by stubs using Smith Charts. |
| C303.4 | Comprehend the characteristics of TE and TM waves. |
| C303.5 | Design a RF transceiver system for wireless communication |

**Course Name: C304 (Image Processing)**

The students will be able to

| | |
|---|---|
| C304.1 | Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms. |
| C304.2 | Operate on images using the techniques of smoothing, sharpening and enhancement. |
| C304.3 | Understand the restoration concepts and filtering techniques. |
| C304.4 | Learn the basics of segmentation, features extraction, compression and recognition methods for color models. |
| C304.5 | Comprehend image compression concepts |

**Course Name: C305 (Satellite Communication)**

The students will be able to

| | |
|---|---|
| C305.1 | Identify the satellite orbits |
| C305.2 | Analyze the satellite subsystems |
| C305.3 | Evaluate the satellite link power budget |
| C305.4 | Identify access technology for satellite |
| C305.5 | Design various satellite applications |

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**Course Name: C306 (Optical Communication & Networks)**

The students will be able to

| | |
|---|---|
| C306.1 | Realize Basic Elements In Optical Fibers, Different Modes And Configurations. |
| C306.2 | Analyze The Transmission Characteristics Associated With Dispersion And Polarization Techniques. |
| C306.3 | Design Optical Sources And Detectors With Their Use In Optical Communication System. |
| C306.4 | Construct Fiber Optic Receiver Systems, Measurements And Techniques. |
| C306.5 | Design Optical Communication Systems And Its Networks. |

**Course Name: C307 (Disaster Risk Reduction And Management)**

The students will be able to

| | |
|---|---|
| C307.1 | To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction |
| C307.2 | To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction |
| C307.3 | To develop disaster response skills by adopting relevant tools and technology |
| C307.4 | Enhance awareness of institutional processes for Disaster response in the country |
| C307.5 | Develop rudimentary ability to respond to their surroundings with potential |

**Course Name: C308 (VLSI Laboratory)**

The students will be able to

| | |
|---|---|
| C308.1 | Write HDL code for basic as well as advanced digital integrated circuit |
| C308.2 | Import the logic modules into FPGA Boards |
| C308.3 | Synthesize Place and Route the digital Ips |
| C308.4 | Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools |
| C308.5 | Test and Verification of IC design |

**Course Name: C309 (Embedded Systems And IOT Design)**

The students will be able to

| | |
|---|---|
| C309.1 | Explain the architecture and features of 8051. |
| C309.2 | Develop a model of an embedded system |
| C309.3 | List the concepts of real time operating systems. |
| C309.4 | Learn the architecture and protocols of IoT. |
| C309.5 | Design an IoT based system for any application. |

**Course Name: C310 (Artificial Intelligence And Machine Learning)**

The students will be able to

| | |
|---|---|
| C310.1 | Use appropriate search algorithms for problem solving |
| C310.2 | Apply reasoning under uncertainty |
| C310.3 | Build supervised learning models |
| C310.4 | Build ensembling and unsupervised models. |
| C310.5 | Build deep learning neural network models |

**Course Name: C311 (Wearable Devices)**

The students will be able to

| | |
|---|---|
| C311.1 | Describe the concepts of wearable system. |
| C311.2 | Explain the energy harvestings in wearable device. |
| C311.3 | Use the concepts of BAN in health care |

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| | |
|---|---|
| C311.4 | Illustrate the concept of smart textile |
| C311.5 | Compare the various wearable devices in healthcare system |

**Course Name: C312 (Wireless Sensor Network Design)**

The students will be able to

| | |
|---|---|
| C312.1 | design solutions for WSNs applications |
| C312.2 | develop efficient MAC and Routing Protocols |
| C312.3 | design solutions for 6LOWPAN applications |
| C312.4 | develop efficient layered protocols in 6LOWPAN |
| C312.5 | use Tiny OS and Contiki OS in WSNs and 6LOWPAN applications |

**Course Name: C313 (Remote Sensing)**

The students will be able

| | |
|---|---|
| C313.1 | To understand the principles of electromagnetic radiation. |
| C313.2 | To learn the atmospheric radiation interactions. |
| C313.3 | To study the laws of planetary motion. |
| C313.4 | To classify the different types of resolution. |
| C313.5 | To know the concepts of digital interpretation |

**Course Name: C314 (Industrial Safety)**

The students will be able to

| | |
|---|---|
| C314.1 | Understand the basic concept of safety. |
| C314.2 | Obtain knowledge of Statutory Regulations and standards. |
| C314.3 | Know about the safety Activities of the Working Place. |
| C314.4 | Analyze on the impact of Occupational Exposures and their Remedies |
| C314.5 | Obtain knowledge of Risk Assessment Techniques. |

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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

### Anna University Regulation 2021

### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS3152 | Professional English - I |
| 2. | C102 | MA3151 | Matrices and Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving and Python Programming |
| 6. | C106 | GE3171 | Problem Solving and Python Programming Laboratory |
| 7. | C107 | GE3152 | Heritage of Tamils |
| 8. | C108 | BS3171 | Physics and Chemistry Laboratory |
| 9. | C109 | GE3172 | English Laboratory |
| 10. | C110 | HS3252 | Professional English - II |
| 11. | C111 | MA3251 | Statistics and Numerical Methods |
| 12. | C112 | PH3256 | Physics for Information Science |
| 13. | C113 | BE3251 | Basic Electrical and Electronics Engineering |
| 14. | C114 | GE3251 | Engineering Graphics |
| 15. | C115 | AD3251 | Data Structures Design |
| 16. | C116 | GE3252 | Tamils and Technology |
| 17. | C117 | GE3271 | Engineering Practices Laboratory |
| 18. | C118 | AD3271 | Data Structures Design Laboratory |
| 19. | C119 | GE3272 | Communication Laboratory / Foreign Language |
| 20. | C201 | MA3354 | Discrete Mathematics |
| 21. | C202 | CS3351 | Digital Principles and Computer Organization |
| 22. | C203 | AD3391 | Database Design and Management |
| 23. | C204 | AD3351 | Design and Analysis of Algorithms |

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| | | | |
|---|---|---|---|
| 24. | C205 | AD3301 | Data Exploration and Visualization |
| 25. | C206 | AL3391 | Artificial Intelligence |
| 26. | C207 | AD3381 | Database Design and Management Laboratory |
| 27. | C208 | AD3311 | Artificial Intelligence Laboratory |
| 28. | C209 | GE3361 | Professional Development |
| 29. | C210 | MA3391 | Probability and Statistics |
| 30. | C211 | AL3452 | Operating Systems |
| 31. | C212 | AL3451 | Machine Learning |
| 32. | C213 | AD3491 | Fundamentals of Data Science and Analytics |
| 33. | C214 | CS3591 | Computer Networks |
| 34. | C215 | GE3451 | Environmental Sciences and Sustainability |
| 35. | C216 | AD3411 | Data Science and Analytics Laboratory |
| 36. | C217 | AD3461 | Machine Learning Laboratory |
| 37. | C301 | AD3501 | Deep Learning |
| 38. | C302 | CW3551 | Data and Information Security |
| 39. | C303 | CS3551 | Distributed Computing |
| 40. | C304 | CCS334 | Big Data Analytics |
| 41. | C305 | CCS332 | App Development |
| 42. | C306 | CCS366 | Software Testing and Automation |
| 43. | C307 | AD3511 | Deep Learning Laboratory |
| 44. | C308 | AD3512 | Summer internship |

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**Course Name: C101 (Professional English – I)**
**Students will be able to**

| | |
|---|---|
| C1O1.1 | Use appropriate words in a professional context |
| C1O1.2 | Gain understanding of basic grammatic structures and use them in right context. |
| C1O1.3 | Read and infer the denotative and connotative meanings of technical texts |
| C1O1.4 | Write definitions, descriptions, narrations and essays on various topics |

**Course Name: C102 (Matrices and Calculus)**
**Students will be able to**

| | |
|---|---|
| C1O2.1 | Use the matrix algebra methods for solving practical problems |
| C1O2.2 | Apply differential calculus tools in solving various application problems. |
| C1O2.3 | Able to use differential calculus ideas on several variable functions. |
| C1O2.4 | Apply different methods of integration in solving practical problems. |
| C1O2.5 | Apply multiple integral ideas in solving areas, volumes and other practical problems. |

**Course Name: C103 (Engineering Physics)**
**Students will be able to**

| | |
|---|---|
| C1O3.1 | Understand the importance of mechanics. |
| C1O3.2 | Express their knowledge in electromagnetic waves. |
| C1O3.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers. |
| C1O3.4 | Understand the importance of quantum physics. |
| C1O3.5 | Comprehend and apply quantum mechanical principles towards the formation of energy. |

**Course Name: C104 (Engineering Chemistry)**
**Students will be able to**

| | |
|---|---|
| C1O4.1 | Infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water. |
| C1O4.2 | Identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications. |
| C1O4.3 | Apply the knowledge of phase rule and composites for material selection requirements. |
| C1O4.4 | Recommend suitable fuels for engineering processes and applications. |
| C104.5 | Recognize different forms of energy resources and apply them for suitable applications in energy sectors. |

**Course Name: C105 (Problem Solving and Python Programming)**
**Students will be able to**

| | |
|---|---|
| C1O5.1 | Develop algorithmic solutions to simple computational problems. |
| C1O5.2 | Develop and execute simple Python programs. |
| C1O5.3 | Write simple Python programs using conditionals and loops for solving problems. |
| C1O5.4 | Decompose a Python program into functions. |
| C105.5 | Represent compound data using Python lists, tuples, dictionaries etc. |
| C105.6 | Read and write data from/to files in Python programs. |

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**Course Name: C106 (Heritage of Tamils)**
**Students will be able to**

| | |
|---|---|
| C1O6.1 | Gain knowledge on language and literature. |
| C1O6.2 | Acquire knowledge about heritage - rock art paintings to modern art – sculpture |
| C1O6.3 | Gain knowledge about folk and martial arts |
| C1O6.4 | Understand about thinai concept of Tamils. |
| C106.5 | Acquire knowledge about contribution of Tamils to Indian national movement and Indian culture |

**Course Name: C107 (Problem Solving and Python Programming Laboratory)**
**Students will be able to**

| | |
|---|---|
| C1O7.1 | Develop algorithmic solutions to simple computational problems |
| C1O7.2 | Develop and execute simple Python programs |
| C1O7.3 | Implement programs in Python using conditionals and loops for solving problems. |
| C1O7.4 | Deploy functions to decompose a Python program. |
| C107.5 | Process compound data using Python data structures. |
| C107.6 | Utilize Python packages in developing software applications. |

**Course Name: C108 (Physics and Chemistry Laboratory)**
**Students will be able to**

| | |
|---|---|
| C1O8.1 | Understand the functioning of various physics laboratory equipment. |
| C1O8.2 | Use graphical models to analyze laboratory data |
| C1O8.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality. |
| C1O8.4 | Access, process and analyze scientific information. |
| C108.5 | Solve problems individually and collaboratively. |

**Course Name: C109 (English Laboratory)**
**Students will be able to**

| | |
|---|---|
| C1O9.1 | To listen to and comprehend general as well as complex academic information. |
| C1O9.2 | To listen to and understand different points of view in a discussion. |
| C1O9.3 | To speak fluently and accurately in formal and informal communicative contexts. |
| C1O9.4 | To describe products and processes and explain their uses and purposes clearly and accurately. |
| C109.5 | To express their opinions effectively in both formal and informal discussions. |

**Course Name: C110 (Professional English - II)**
**Students will be able to**

| | |
|---|---|
| C110.1 | To compare and contrast products and ideas in technical texts. |
| C110.2 | To identify and report cause and effects in events, industrial processes through technical texts |
| C110.3 | To analyse problems in order to arrive at feasible solutions and communicate them in the written format. |
| C110.4 | To present their ideas and opinions in a planned and logical manner |
| C110.5 | To draft effective resumes in the context of job search. |

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**Course Name: C111 (Statistics and Numerical Methods)**
**Students will be able to**

| | |
|---|---|
| C111.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| C111.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C111.3 | Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. |
| C111.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C111.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course Name: C112 (Physics for Information Science)**
**Students will be able to**

| | |
|---|---|
| C112.1 | Gain knowledge on classical and quantum electron theories, and energy band structures |
| C112.2 | Acquire knowledge on basics of semiconductor physics and its applications in various devices |
| C112.3 | Get knowledge on magnetic properties of materials and their applications in data storage, |
| C112.4 | Have the necessary understanding on the functioning of optical materials for optoelectronics |
| C112.5 | Understand the basics of quantum structures and their applications and basics of quantum computing |

**Course Name: C113 (Basic Electrical and Electronics Engineering)**
**Students will be able to**

| | |
|---|---|
| C113.1 | Compute the electric circuit parameters for simple problems CO2: |
| C113.2 | Explain the working principle and applications of electrical machines |
| C113.3 | Analyze the characteristics of analog electronic devices |
| C113.4 | Explain the basic concepts of digital electronics |
| C113.5 | Explain the operating principles of measuring instruments |

**Course Name: C114 (Engineering Graphics)**
**Students will be able to**

| | |
|---|---|
| C114.1 | Use BIS conventions and specifications for engineering drawing. |
| C114.2 | Construct the conic curves, involutes and cycloid. |
| C114.3 | Solve practical problems involving projection of lines. |
| C114.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C114.5 | Draw the development of simple solids. |

**Course Name: C115 (Data Structures Design)**
**Students will be able to**

| | |
|---|---|
| C115.1 | Explain abstract data types |
| C115.2 | Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications |

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| | |
|---|---|
| C115.3 | Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting |
| C115.4 | Model problems as graph problems and implement efficient graph algorithms to solve them |

**Course Name: C116 (Tamils and Technology)**
**Students will be able to**

| | |
|---|---|
| C116.1 | Gain knowledge about weaving and ceramic technology |
| C116.2 | Understand about design and construction technology |
| C116.3 | Acquire knowledge about manufacturing technology |
| C116.4 | Gain knowledge about agriculture and irrigation technology |
| C116.5 | Acquire knowledge about scientific Tamil & Tamil computing |

**Course Name: C117 (Engineering Practices Laboratory)**
**Students will be able to**

| | |
|---|---|
| C117.1 | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. |
| C117.2 | Wire various electrical joints in common household electrical wire work. |
| C117.3 | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. |
| C117.4 | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB. |

**Course Name: C118 (Data Structures Design Laboratory)**
**Students will be able to**

| | |
|---|---|
| C118.1 | Implement ADTs as Python classes |
| C118.2 | Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications |
| C118.3 | Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting |
| C118.4 | Model problems as graph problems and implement efficient graph algorithms to solve them |

**Course Name: C119 (Communication Laboratory / Foreign Language)**
**Students will be able to**

| | |
|---|---|
| C119.1 | Speak effectively in group discussions held in a formal/semi formal contexts |
| C119.2 | Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions |
| C119.3 | Write emails, letters and effective job applications. |
| C119.4 | Write critical reports to convey data and information with clarity and precision |
| C119 .5 | Give appropriate instructions and recommendations for safe execution of tasks |

**Course Name: C201 (Discrete Mathematics)**
**Students will be able to**

| | |
|---|---|
| C201.1 | Have knowledge of the concepts needed to test the logic of a program. |

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| | |
|---|---|
| C201.2 | Have an understanding in identifying structures on many levels. |
| C201.3 | Aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science. |
| C201.4 | Aware of the counting principles. |
| C201.5 | Exposed to concepts and properties of algebraic structures such as groups, rings and fields. |

**Course Name: C202 (Digital Principles and Computer Organization)**
**Students will be able to**

| | |
|---|---|
| C202.1 | Design various combinational digital circuits using logic gates |
| C202.2 | Design sequential circuits and analyze the design procedures |
| C202.3 | State the fundamentals of computer systems and analyze the execution of an instruction |
| C202.4 | Analyze different types of control design and identify hazards |
| C202.5 | Identify the characteristics of various memory systems and I/O communication |

**Course Name: C203 (Database Design and Management)**
**Students will be able to**

| | |
|---|---|
| C203.1 | Understand the database development life cycle and apply conceptual modeling |
| C203.2 | Apply SQL and programming in SQL to create, manipulate and query the database |
| C203.3 | Apply the conceptual-to-relational mapping and normalization to design relational database |
| C203.4 | Determine the serializability of any non-serial schedule using concurrency techniques |
| C203.5 | Apply the data model and querying in Object-relational and No-SQL databases. |

**Course Name: C204 (Design and Analysis of Algorithms)**
**Students will be able to**

| | |
|---|---|
| C204.1 | Analyze the efficiency of recursive and non-recursive algorithms mathematically |
| C204.2 | Analyze the efficiency of brute force, divide and conquer, decrease and conquer, Transform and conquer algorithmic techniques |
| C204.3 | Implement and analyze the problems using dynamic programming and greedy algorithmic techniques. |
| C204.4 | Solve the problems using iterative improvement techniques for optimization. |
| C204.5 | Compute the limitations of algorithmic power and solve the problems using backtracking and branch and bound techniques. |

**Course Name: C205 (Data Exploration and Visualization)**
**Students will be able to**

| | |
|---|---|
| C205.1 | Understand the fundamentals of exploratory data analysis. |
| C205.2 | Implement the data visualization using Matplotlib. |
| C205.3 | Perform univariate data exploration and analysis. |
| C205.4 | Apply bivariate data exploration and analysis. |
| C205.5 | Use Data exploration and visualization techniques for multivariate and time series data. |

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**Course Name: C206 (Artificial Intelligence)**
**Students will be able to**

| | |
|---|---|
| C206.1 | Explain intelligent agent frameworks |
| C206.2 | Apply problem solving techniques |
| C206.3 | Apply game playing and CSP techniques |
| C206.4 | Perform logical reasoning |
| C206.5 | Perform probabilistic reasoning under uncertainty |

**Course Name: C207 (Database Design and Management Laboratory)**
**Students will be able to**

| | |
|---|---|
| C207.1 | Understand the database development life cycle |
| C207.2 | Design relational database using conceptual-to-relational mapping, Normalization |
| C207.3 | Apply SQL for creation, manipulation and retrieval of data |
| C207.4 | Develop a database applications for real-time problems |
| C207.5 | Design and query object-relational databases |

**Course Name: C208 (Artificial Intelligence Laboratory)**
**Students will be able to**

| | |
|---|---|
| C208.1 | Design and implement search strategies |
| C208.2 | Implement game playing and CSP techniques |
| C208.3 | Develop logical reasoning systems |
| C208.4 | Develop probabilistic reasoning systems |

**Course Name: C209 (Professional Development)**
**Students will be able to**

| | |
|---|---|
| C209.1 | Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements |
| C209.2 | Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding |
| C209.3 | Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects. |

**Course Name: C210 (Probability and Statistics)**
**Students will be able to**

| | |
|---|---|
| C210.1 | Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. |
| C210.2 | Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. |
| C210.3 | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| C210.4 | Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control. |
| C210.5 | Have the notion of sampling distributions and statistical techniques used in engineering and management problems. |

**Course Name: C211 (Operating Systems)**
**Students will be able to**

| | |
|---|---|
| C211.1 | Analyze various scheduling algorithms and process synchronization. |

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| | |
|---|---|
| C211.2 | Explain deadlock, prevention and avoidance algorithms. |
| C211.3 | Compare and contrast various memory management schemes. |
| C211.4 | Explain the functionality of file systems I/O systems, and Virtualization |
| C211.5 | Compare iOS and Android Operating Systems. |

**Course Name: C212 (Machine Learning)**

**Students will be able to**

| | |
|---|---|
| C212.1 | Explain the basic concepts of machine learning. C |
| C212.2 | Construct supervised learning models. |
| C213.3 | Construct unsupervised learning algorithms. |
| C214.4 | Evaluate and compare different models |

**Course Name: C213 (Fundamentals of Data Science and Analytics)**

**Students will be able to**

| | |
|---|---|
| C213.1 | Explain the data analytics pipeline |
| C213.2 | Describe and visualize data |
| C213.3 | Perform statistical inferences from data |
| C213.4 | Analyze the variance in the data |
| C213.5 | Build models for predictive analytics |

**Course Name: C214 (Computer Networks)**

**Students will be able to**

| | |
|---|---|
| C214.1 | Explain the basic layers and its functions in computer networks. |
| C214.2 | Understand the basics of how data flows from one node to another. |
| C214.3 | Analyze routing algorithms |
| C214.4 | Describe protocols for various functions in the network. |
| C214.5 | Analyze the working of various application layer protocols. |

**Course Name: C215 (Environmental Sciences and Sustainability)**

**Students will be able to**

| | |
|---|---|
| C215.1 | Recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. |
| C215.2 | Identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |
| C215.3 | Identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| C215.4 | Recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |
| C215.5 | Demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization. |

**Course Name: C216 (Data Science and Analytics Laboratory)**

**Students will be able to**

| | |
|---|---|
| C216.1 | Write python programs to handle data using Numpy and Pandas |
| C216.2 | Perform descriptive analytics |
| C216.3 | Perform data exploration using Matplotlib |
| C216.4 | Perform inferential data analytics |

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| | |
|---|---|
| C216.5 | Build models of predictive analytics |

**Course Name: C217 (Machine Learning Laboratory)**

**Students will be able to**

| | |
|---|---|
| C217.1 | Apply suitable algorithms for selecting the appropriate features for analysis. |
| C217.2 | Implement supervised machine learning algorithms on standard datasets and evaluate the performance. |
| C217.3 | Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance. |
| C217.4 | Build the graph based learning models for standard data sets. |
| C217.5 | Assess and compare the performance of different ML algorithms and select the suitable one based on the application. |

**Course Name: C301 (Deep Learning)**

**Students will be able to**

| | |
|---|---|
| C301.1 | Explain the basics in deep neural networks |
| C301.2 | Apply Convolution Neural Network for image processing |
| C301.3 | Apply Recurrent Neural Network and its variants for text analysis |
| C301.4 | Apply model evaluation for various applications |
| C301.5 | Apply autoencoders and generative models for suitable applications |

**Course Name: C302 (Data and Information Security)**

**Students will be able to**

| | |
|---|---|
| C302.1 | Understand the basics of data and information security |
| C302.2 | Understand the legal, ethical and professional issues in information security |
| C302.3 | Understand the various authentication schemes to simulate different applications. |
| C302.4 | Understand various security practices and system security standards |
| C302.5 | Understand the Web security protocols for E-Commerce applications |

**Course Name: C303 (Distributed Computing)**

**Students will be able to**

| | |
|---|---|
| C303.1 | Explain the foundations of distributed systems (K2) |
| C303.2 | Solve synchronization and state consistency problems (K3) |
| C303.3 | Use resource sharing techniques in distributed systems (K3) |
| C303.4 | Apply working model of consensus and reliability of distributed systems (K3) |
| C303.5 | Explain the fundamentals of cloud computing (K2) |

**Course Name: C304 (Big Data Analytics)**

**Students will be able to**

| | |
|---|---|
| C304.1 | Describe big data and use cases from selected business domains. |
| C304.2 | Explain NoSQL big data management. |
| C304.3 | Install, configure, and run Hadoop and HDFS. |
| C304.4 | Perform map-reduce analytics using Hadoop. |
| C304.5 | Use Hadoop-related tools such as HBase, Cassandra, Pig, and Hive for big data analytics. |

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**Course Name: C305 (App Development)**

**Students will be able to**

| | |
|---|---|
| C305.1 | Develop Native applications with GUI Components. |
| C305.2 | Develop hybrid applications with basic event handling |
| C305.3 | Implement cross-platform applications with location and data storage capabilities. |
| C305.4 | Implement cross platform applications with basic GUI and event handling. |
| C305.5 | Develop web applications with cloud database access. |

**Course Name: C306 (Software Testing and Automation)**

**Students will be able to**

| | |
|---|---|
| C306.1 | Understand the basic concepts of software testing and the need for software testing |
| C306.2 | Design Test planning and different activities involved in test planning |
| C306.3 | Design effective test cases that can uncover critical defects in the application |
| C306.4 | Carry out advanced types of testing |
| C306.5 | Automate the software testing using Selenium and TestNG |

**Course Name: C307 (Deep Learning Laboratory)**

**Students will be able to**

| | |
|---|---|
| C307.1 | Apply deep neural network for simple problems (K3) |
| C307.2 | Apply Convolution Neural Network for image processing (K3) |
| C307.3 | Apply Recurrent Neural Network and its variants for text analysis (K3) |
| C307.4 | Apply generative models for data augmentation (K3) |
| C307.5 | Develop real-world solutions using suitable deep neural networks (K4) |

**Course Name: C308 (Summer Internship)**

**Students will be able to**

| | |
|---|---|
| C308.1 | Industry Practices, Processes, Techniques, technology, automation and other core aspects of software industry |
| C308.2 | Analyze, Design solutions to complex business problems |
| C308.3 | Build and deploy solutions for target platform |
| C308.4 | Preparation of Technical reports and presentation |

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## DEPARTMENT OF MECHANICAL ENGINEERING

Anna University Regulation 2021

List of course names

| S. No. | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS3151 | Professional English - I |
| 2. | C102 | MA3151 | Matrices And Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving And Python Programming |
| 6. | C106 | GE3152 | Scientific Thoughts In Tamil |
| 7. | C107 | GE3171 | Problem Solving And Python Programming Laboratory |
| 8. | C108 | BS3171 | Physics And Chemistry Laboratory |
| 9. | C109 | GE3172 | English Laboratory |
| 10. | C110 | HS3251 | Professional English - II |
| 11. | C111 | MA3251 | Statistics And Numerical Methods |
| 12. | C112 | PH3251 | Materials Science |
| 13. | C113 | BE3251 | Basic Electrical And Electronics Engineering |
| 14. | C114 | GE3251 | Engineering Graphics |
| 15. | C115 | GE3252 | Heritage Of Tamils |
| 16. | C117 | GE3271 | Engineering Practices Laboratory |
| 17. | C118 | BE3271 | Basic Electrical And Electronics Engineering Laboratory |
| 18. | C119 | GE3272 | Communication Laboratory / Foreign Language |
| 19. | C201 | MA3351 | Transforms And Partial Differential Equations |
| 20. | C202 | ME3351 | Engineering Mechanics |
| 21. | C203 | ME3391 | Engineering Thermodynamics |
| 22. | C204 | CE3391 | Fluid Mechanics And Machinery |
| 23. | C205 | ME3392 | Engineering Materials And Metallurgy |
| 24. | C206 | ME3393 | Manufacturing Processes |

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| | | | |
|---|---|---|---|
| 25. | C207 | ME3381 | Computer Aided Machine Drawing |
| 26. | C208 | ME3382 | Manufacturing Technology Laboratory |
| 27. | C209 | GE3361 | Professional Development |
| 28. | C210 | ME3491 | Theory Of Machines |
| 29. | C211 | ME3451 | Thermal Engineering |
| 30. | C212 | ME3492 | Hydraulics And Pneumatics |
| 31. | C213 | ME3493 | Manufacturing Technology |
| 32. | C214 | CE3491 | Strength Of Materials |
| 33. | C215 | GE3451 | Environmental Sciences And Sustainability |
| 34. | C216 | CE3481 | Strength Of Materials And Fluid Machinery Laboratory |
| 35. | C217 | ME3461 | Thermal Engineering Laboratory |
| 36. | C301 | ME3591 | Design Of Machine Elements |
| 37. | C302 | ME3592 | Metrology And Measurements |
| 38. | C303 | ME3511 | Summer Internship |
| 39. | C304 | ME3581 | Metrology And Dynamics Laboratory |
| 40. | C301 | ME3591 | Design Of Machine Elements |
| 41. | C302 | ME3592 | Metrology And Measurements |
| 42. | C303 | CME347 | Lean Manufacturing |
| 43. | C304 | CME384 | Power Plant Engineering |
| 44. | C305 | CME386 | Gas Dynamics And Jet Propulsion |
| 45. | C306 | MX3084 | Disaster Risk Reduction And Management |
| 46. | C308 | ME3581 | Metrology And Dynamics Laboratory |

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**Course name: C101 (Professional English–I)**

The students will be able to:

| | |
|---|---|
| C101.1 | Listen and comprehend complex academic texts. |
| C101.2 | Read and infer the denotative and connotative meanings of technical texts. |
| C101.3 | Write definitions, descriptions, narrations and essays on various topics. |
| C101.4 | Speak fluently and accurately in formal and informal communicative contexts. |
| C101.5 | Express their opinions effectively in both oral and written medium of communication |

**Course name: C102 (Matrices and Calculus)**

The students will be able to:

| | |
|---|---|
| C102.1 | Convert quadratic form into its canonical form through linear and orthogonal transformation. |
| C102.2 | Calculate extreme values of a function. |
| C102.3 | Explain the differential calculus for multivariable functions. |
| C102.4 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. |
| C102.5 | Estimate the area and volume using integrals. |

**Course name: C103 (Engineering Physics)**

The students will be able to:

| | |
|---|---|
| C103.1 | Understand the importance of mechanics. |
| C103.2 | Express their knowledge in electromagnetic waves. |
| C103.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers. |
| C103.4 | Understand the importance of quantum physics. |
| C103.5 | Comprehend and apply quantum mechanical principles towards the formation of energy bands |

**Course name: C104 (Engineering Chemistry)**

The students will be able to:

| | |
|---|---|
| C104.1 | Inculcate sound understanding of water quality parameters and water treatment techniques. |
| C104.2 | Impart knowledge on the basic principles and preparatory methods of nonmaterials. |
| C104.3 | Introduce the basic concepts and applications of phase rule and composites. |
| C104.4 | Facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics. |
| C104.5 | Familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices. |

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**Course name: C105 (Problem Solving and Python Programming)**

The students will be able to:

| | |
|---|---|
| C104.1 | Develop algorithmic solutions to simple computational problems. |
| C104.2 | Develop and execute simple Python programs. |
| C104.3 | Write simple Python programs using conditionals and looping for solving problems and Decompose a Python program into functions. |
| C104.4 | Represent compound data using Python lists, tuples, dictionaries etc. |
| C104.5 | Read and write data from/to files in Python programs. |

**Course name: C106 (Scientific Thoughts In Tamil)**

The students will be able to:

| | |
|---|---|
| C106.1 | To gain knowledge on language and literature. |
| C106.2 | To acquire knowledge about heritage - rock art paintings to modern art – sculpture |
| C106.3 | To gain knowledge about folk and martial arts |
| C106.4 | To understand about thinai concept of Tamils. |
| C106.5 | To acquire knowledge about contribution of Tamils to Indian national movement and Indian culture |

**Course name: C107 (Problem Solving and Python Programming Laboratory)**

The students will be able to:

| | |
|---|---|
| C106.1 | Develop algorithmic solutions to simple computational problems. |
| C106.2 | Develop and execute simple Python programs. |
| C106.3 | Implement programs in Python using conditionals and loops for solving problems. |
| C106.4 | Deploy functions to decompose a Python program. |
| C106.5 | Process compound data using Python data structures. |
| C106.6 | Utilize Python packages in developing software applications. |

**Course name: C107 (Physics and Chemistry Laboratory)**

The students will be able to:

| | |
|---|---|
| C107.1 | Understand the functioning of various physics laboratory equipment |
| C107.2 | Use graphical models to analyze laboratory data |
| C107.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C107.4 | Access, process and analyze scientific information |
| C107.5 | Solve problems individually and collaboratively |

**Course name: C109 (English Laboratory)**

The students will be able to:

| | |
|---|---|
| C109.1 | Listen to and comprehend general as well as complex academic information |
| C109.2 | Listen to and understand different points of view in a discussion |
| C109.3 | Speak fluently and accurately in formal and informal communicative contexts |

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| | |
|---|---|
| C109.4 | Describe products and processes and explain their uses and purposes clearly and accurately |
| C109.5 | Express their opinions effectively in both formal and informal discussions |

**Course name: C110 (Professional English –II)**

The students will be able to:

| | |
|---|---|
| C110.1 | Engage learners in meaningful language activities to improve their LSRW skills. |
| C110.2 | Enhance learners' awareness of general rules of writing for specific audiences. |
| C110.3 | Help learners understand the purpose, audience, contexts of different types of writing. |
| C110.4 | Develop analytical thinking skills for problem Solving in communicative contexts. |
| C110.5 | Demonstrate an understanding of job applications and interviews for internship and placements. |

**Course name:C111(Statistics and Numerical Methods)**

The students will be able to:

| | |
|---|---|
| C111.1 | Apply the concept of testing of hypothesis for small and large samples in real life problems. |
| C111.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C111.3 | Appreciate the numerical techniques of interpolation in various intervals and numerical integration for engineering problems |
| C111.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C111.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course name: C112 (Materials Science)**

The students will be able to:

| | |
|---|---|
| C112.1 | Know basics of crystallography and its importance for varied materials properties. |
| C112.2 | Gain knowledge on the electrical and magnetic properties of materials and their applications. |
| C112.3 | Understand clearly of semiconductor physics and functioning of semi conductor devices. |
| C112.4 | Understand the optical properties of materials and working principles of various optical devices. |
| C112.5 | Appreciate the importance of functional nano electronic devices. |

**Course name: C113 (Basic Electrical and Electronics Engineering)**

The students will be able to:

| | |
|---|---|
| C113.1 | Compute the electric circuit parameters for simple problems. |

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| | |
|---|---|
| C113.2 | Explain the working principle and applications of electrical machines. |
| C113.3 | Analyze the characteristics of analog electronic devices. |
| C113.4 | Explain the basic concepts of digital electronics. |
| C113.5 | Explain the operating principles of measuring instruments. |

**Course name: C114 (Engineering Graphics)**

The students will be able to:

| | |
|---|---|
| C114.1 | Use BIS conventions and specifications for engineering drawing. |
| C114.2 | Construct the conic curves, involutes and cycloid. |
| C114.3 | Solve practical problems involving projection of lines. |
| C114.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C114.5 | Draw the development of simple solids. |

**Course name: C115 (Heritage Of Tamils)**

The students will be able to:

| | |
|---|---|
| C115.1 | Gain knowledge about weaving and ceramic technology |
| C115.2 | Understand about design and construction technology |
| C115.3 | Acquire knowledge about manufacturing technology |
| C115.4 | Gain knowledge about agriculture and irrigation technology |
| C115.5 | Acquire knowledge about scientific tamil & tamil computing |

**Course name: C116 (Engineering Practices Laboratory)**

The students will be able to:

| | |
|---|---|
| C116.1 | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work. |
| C116.2 | Wire various electrical joints in common household electrical wire work. |
| C116.3 | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; |
| C116.4 | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB. |
| C116.5 | Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work. |

**Course name: C117 (Basic Electrical and Electronics Engineering Laboratory)**

The students will be able to:

| | |
|---|---|
| C117.1 | Use experimental methods to verify the Ohm's and Kirchhoff's Laws. |
| C117.2 | Analyze experimentally the load characteristics of electrical machines. |
| C117.3 | Analyze the characteristics of basic electronic devices. |
| C117.4 | Use DSO to measure the various parameters. |
| C117.5 | Compare the characteristics of load with theoretical and experimental method. |

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**Course name: C118 (Communication Laboratory)**

The students will be able to:

| | |
|---|---|
| C118.1 | Speak effectively in group discussions held in a formal/semi formal contexts |
| C118.2 | Discuss, analyze and present concepts and problems from various perspectives to arrive at suitable solutions |
| C118.3 | Write emails, letters and effective job applications. |
| C118.4 | Write critical reports to convey data and information with clarity and precision |
| C118.5 | Give appropriate instructions and recommendations for safe execution of tasks |

**Course name: C201 (Transforms and Partial Differential Equations)**

The students will be able to:

| | |
|---|---|
| C201.1 | Understand how to solve the given standard partial differential equations. |
| C201.2 | Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. |
| C201.3 | Appreciate the physical significance of Fourier series techniques in solving one- and two dimensional heat flow problems and one-dimensional wave equations. |
| C201.4 | Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering. |
| C201.5 | Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems |

**Course name: C202 (Engineering Mechanics)**

The students will be able to:

| | |
|---|---|
| C202.1 | Illustrate the vector and scalar representation of forces and moments |
| C202.2 | Analyze the rigid body in equilibrium |
| C202.3 | Evaluate the properties of distributed forces |
| C202.4 | Determine the friction and the effects by the laws of friction |
| C202.5 | Calculate dynamic forces exerted in rigid body |

**Course name: C203 (Engineering Thermodynamics)**

The students will be able to:

| | |
|---|---|
| C203.1 | Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems |
| C203.2 | Apply the second law of thermodynamics in analyzing the performance of thermal devices through energy and entropy calculations. |
| C203.3 | Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart |
| C203.4 | Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations |
| C203.5 | Apply the properties of gas mixtures in calculating the properties of gas mixtures |

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| | |
|---|---|
| | and applying various thermodynamic relations to calculate property changes |

**Course name: C204 (Fluid Mechanics and Machinery)**

The students will be able to:

| | |
|---|---|
| C204.1 | Understand the properties and behavior in static conditions. Also, to understand the conservation laws applicable to fluids and its application through fluid kinematics and dynamics |
| C204.2 | Estimate losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel. Also, to understand the concept of boundary layer and its thickness on the flat solid surface. |
| C204.3 | Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performances of prototype by model studies |
| C204.4 | Explain the working principles of various turbines and design the various types of turbines. |
| C204.5 | Explain the working principles of centrifugal, reciprocating and rotary pumps and design the centrifugal and reciprocating pumps |

**Course name: C205 (Engineering Materials and Metallurgy)**

The students will be able to:

| | |
|---|---|
| C205.1 | Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification. |
| C205.2 | Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes. |
| C205.3 | Clarify the effect of alloying elements on ferrous and non-ferrous metals. |
| C205.4 | Summarize the properties and applications of non-metallic materials. |
| C205.5 | Explain the testing of mechanical properties |

**Course name: C206 (Manufacturing Processes)**

The students will be able to:

| | |
|---|---|
| C206.1 | Explain the principle of different metal casting processes. |
| C206.2 | Describe the various metal joining processes. |
| C206.3 | Illustrate the different bulk deformation processes. |
| C206.4 | Apply the various sheet metals forming process. |
| C206.5 | Apply suitable molding technique for manufacturing of plastics components. |

**Course name: C207 (Computer Aided Machine Drawing)**

The students will be able to:

| | |
|---|---|
| C207.1 | Prepare standard drawing layout for modeled assemblies. |
| C207.2 | Model orthogonal views of machine components. |
| C207.3 | Prepare standard drawing layout for modeled parts |
| C207.4 | Assemble the components to the main drawing. |
| C207.5 | Prepare BOM for the assemblies. |

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**Course name: C208 (Manufacturing Technology Laboratory)**

The students will be able to:

| | |
|---|---|
| C208.1 | Demonstrate the safety precautions exercised in the mechanical workshop and join two metals using GMAW. |
| C208.2 | The students able to make the work piece as per given shape and size using machining process such as rolling, drawing, turning, shaping, drilling and milling. |
| C208.3 | The students become make the gears using gear making machines and analyze the defects in the cast and machined components |
| C208.4 | Students are able to perform components of assemblies with precise dimensions. |
| C208.5 | The precision of the work in the machining process will be well maintained by the students for advanced jobs. |

**Course name: C209 (Professional Development)**

The students will be able to:

| | |
|---|---|
| C209.1 | Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements. |
| C209.2 | Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding. |
| C209.3 | Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects. |
| C209.4 | The combined work in relating each components of MS Office for the application of variety of works are performed. |
| C209.5 | The mode of presentation of the contend of the work in variety of tools and be able to identify the importance of the tools are understood. |

**Course name: C210 (Theory of Machines)**

The students will be able to:

| | |
|---|---|
| C210.1 | Discuss the basics of mechanism. |
| C210.2 | Solve problems on gears and gear trains. |
| C210.3 | Examine friction in machine elements. |
| C210.4 | Calculate static and dynamic forces of mechanisms. |
| C210.5 | Calculate the balancing masses and their locations of reciprocating and rotating masses. Computing the frequency of free vibration, forced vibration and damping coefficient. |

**Course name: C211 (Thermal Engineering)**

The students will be able to:

| | |
|---|---|
| C211.1 | Apply thermodynamic concepts to different air standard cycles and solve problems. |
| C211.2 | To solve problems in steam nozzle and calculate critical pressure ratio. |
| C211.3 | Explain the flow in steam turbines, draw velocity diagrams, flow in Gas turbines and solve problems. |
| C211.4 | Explain the functioning and features of IC engine, components and auxiliaries. |
| C211.5 | Calculate the various performance parameters of IC engines |

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**Course name: C212 (Hydraulics and Pneumatics)**

The students will be able to:

| | |
|---|---|
| C212.1 | Apply the working principles of fluid power systems and hydraulic pumps. |
| C212.2 | Apply the working principles of hydraulic actuators and control components. |
| C212.3 | Design and develop hydraulic circuits and systems. |
| C212.4 | Apply the working principles of pneumatic circuits and power system and its components. |
| C212.5 | Identify various troubles shooting methods in fluid power systems. |

**Course name: C213 (Manufacturing Technology)**

The students will be able to:

| | |
|---|---|
| C213.1 | Apply the mechanism of metal removal process and to identify the factors involved in improving machinability. |
| C213.2 | Describe the constructional and operational features of centre lathe and other special purpose lathes. |
| C213.3 | Describe the constructional and operational features of reciprocating machine tools. |
| C213.4 | Apply the constructional features and working principles of CNC machine tools. |
| C213.5 | Demonstrate the Program CNC machine tools through planning, writing codes and setting up CNC machine tools to manufacture a given component. |

**Course name: C214 (Strength of Materials)**

The students will be able to:

| | |
|---|---|
| C214.1 | Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. |
| C214.2 | Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. |
| C214.3 | Apply basic equation of torsion in designing of shafts and helical springs |
| C214.4 | Calculate slope and deflection in beams using different methods. |
| C214.5 | Analyze thin and thick shells for applied pressures. |

**Course name: C215 (Environmental Sciences and Sustainability)**

The students will be able to:

| | |
|---|---|
| C215.1 | To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. |
| C215.2 | To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |
| C215.3 | To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| C215.4 | To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |
| C215.5 | To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization. |

**Course name: C216 (Strength of Materials and Fluid Machinery Laboratory)**

The students will be able to:

| | |
|---|---|
| C216.1 | Determine the tensile, torsion and hardness properties of metals by testing |

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| | |
|---|---|
| C216.2 | Determine the stiffness properties of helical and carriage spring |
| C216.3 | Apply the conservation laws to determine the coefficient of discharge of a venture-meter and finding the friction factor of given pipe |
| C216.4 | Apply the fluid static and Momentum principles to determine the metacentric height and forces due to impact of jet |
| C216.5 | Determine the performance characteristics of turbine, roto-dynamic pump and positive displacement pump |

**Course name: C217 (Thermal Engineering Laboratory)**

The students will be able to:

| | |
|---|---|
| C217.1 | Conduct tests to evaluate performance characteristics of IC engines |
| C217.2 | Conduct tests to evaluate the performance of refrigeration cycle |
| C217.3 | Conduct tests to evaluate Performance and Energy Balance on a Steam Generator. |
| C217.4 | Conduct experiments to understand the basics of the operation of IC Engines. |
| C217.5 | Conduct experiments to relate and study the process of engines, refrigerators and steam generators were performed. |

**Course name: C301 (Design of Machine Elements)**

The students will be able to:

| | |
|---|---|
| C301.1 | Explain the design machine members subjected to static and variable loads. |
| C301.2 | Apply the concepts design to shafts, key and couplings. |
| C301.3 | Apply the concepts of design to bolted, Knuckle, Cotter, riveted and welded joints. |
| C301.4 | Apply the concept of design helical, leaf springs, flywheels, connecting rods and crank shafts. |
| C301.5 | Apply the concepts of design and select sliding and rolling contact bearings, seals and gaskets. |

**Course name: C302 (Metrology and Measurements)**

The students will be able to:

| | |
|---|---|
| C302.1 | Discuss the concepts of measurements to apply in various metrological instruments. |
| C302.2 | Apply the principle and applications of linear and angular measuring instruments, assembly and transmission elements. |
| C302.3 | Apply the tolerance symbols and tolerance analysis for industrial applications. |
| C302.4 | Apply the principles and methods of form and surface metrology. |
| C302.5 | Apply the advances in measurements for quality control in manufacturing Industries. |

**Course name: C303 (Lean Manufacturing)**

The students will be able to:

| | |
|---|---|
| C303.1 | Discuss the basics of 6 SIGMA |
| C303.2 | Elaborate the lean manufacturing tools. |
| C303.3 | Illustrate about the deeper understanding methodologies of Lean manufacturing. |
| C303.4 | Discuss lean concepts and its elements. |
| C303.5 | Describe the implementation and challenges of lean manufacturing. |

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**Course name: C304 (POWER PLANT ENGINEERING)**

The students will be able to:

| | |
|---|---|
| C304.1 | Explain the layout, construction and working of the components inside a thermal power plant. |
| C304.2 | Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. |
| C304.3 | Explain the layout, construction and working of the components inside nuclear power plants. |
| C304.4 | Explain the layout, construction and working of the components inside Renewable energy power plants |
| C304.5 | Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production. |

**Course name: C305 (GAS DYNAMICS AND JET PROPULSION)**

The students will be able to:

| | |
|---|---|
| C305.1 | Apply the fundamentals of compressible flow concepts and the use of gas tables. |
| C305.2 | Analyze the compressible flow behaviour in constant area ducts. |
| C305.3 | Analyze the development of shock waves and its effects. |
| C305.4 | Explain the types of jet engines and their performance parameters. |
| C305.5 | Explain the types of rocket engines and their performance parameters |

**Course name: C306 (DISASTER RISK REDUCTION AND MANAGEMENT)**

The students will be able to:

| | |
|---|---|
| C306.1 | To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR) |
| C306.2 | To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction |
| C306.3 | To develop disaster response skills by adopting relevant tools and technology |
| C306.4 | Enhance awareness of institutional processes for Disaster response in the country. |
| C306.5 | Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity |

**Course name: C307 (COMPUTER INTEGRATED MANUFACTURING)**

The students will be able to:

| | |
|---|---|
| C307.1 | The students able to measure the gear tooth dimensions, angle using sine bar and straightness. |
| C307.2 | Determine mass moment of inertia of mechanical element, governor effort and range of sensitivity. |
| C307.3 | Determine the natural frequency and damping coefficient, critical speeds of shafts, |
| C307.4 | The precision measurements of the components were practiced. |
| C307.5 | The effects of the vibration on the components were understood. |

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**Course name: C308 (Metrology and Dynamics Laboratory)**

The students will be able to:

| | |
|---|---|
| C308.1 | Explain the layout, construction and working of the components inside a thermal power plant. |
| C308.2 | Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. |
| C308.3 | Explain the layout, construction and working of the components inside nuclear power plants. |
| C308.4 | Explain the layout, construction and working of the components inside Renewable energy power plants |
| C308.5 | Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production. |

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## DEPARTMENT OF FASHION TECHNOLOGY
### Anna University Regulation 2021
### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | HS3151 | Professional English - I |
| 2. | C102 | MA3151 | Matrices and Calculus |
| 3. | C103 | PH3151 | Engineering Physics |
| 4. | C104 | CY3151 | Engineering Chemistry |
| 5. | C105 | GE3151 | Problem Solving and Python Programming |
| 6. | C106 | GE3152 | Heritage of Tamils |
| 7. | C107 | GE3171 | Problem Solving and Python Programming Laboratory |
| 8. | C108 | BS3171 | Physics and Chemistry Laboratory |
| 9. | C109 | GE3172 | English Laboratory |
| 10. | C110 | HS3251 | Professional English - II |
| 11. | C111 | MA3251 | Statistics and Numerical Methods |
| 12. | C112 | FT3201 | Fibre Science |
| 13. | C113 | BE3252 | Basic Electrical, Electronics and Instrumentation Engineering |
| 14. | C114 | GE3251 | Engineering Graphics |
| 15. | C115 | CY3252 | Chemistry for Textile Technologists |
| 16. | C116 | GE3252 | Tamils and Technology |
| 17. | C117 | GE3271 | Engineering Practices Laboratory |
| 18. | C118 | BE3272 | Basic Electrical, Electronics and Instrumentation Engineering Laboratory |
| 19. | C119 | GE3272 | Communication Laboratory / Foreign Language |
| 20. | C201 | MA335 | Probability and Statistical Methods |
| 21. | C202 | FT3001 | Characteristics of Textile Fibres |
| 22. | C203 | FT3002 | Technology of Spinning processes |
| 23. | C204 | FT3003 | Fabric Manufacturing |
| 24. | C205 | FT3004 | Fabric Structures |
| 25. | C206 | FT3005 | Concepts and Evolution of Fashion and Design |

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| | | | |
|---|---|---|---|
| 26. | C207 | FT3311 | Fabric Structure Laboratory |
| 27. | C208 | FT3312 | Fashion Illustration Laboratory |
| 28. | C209 | GE3361 | Professional Development |
| 29. | C210 | FT3401 | Apparel Production Machinery |
| 30. | C211 | FT3402 | Fabric and Garment Quality Evaluation |
| 31. | C212 | FT3403 | Fundamentals of Garment Manufacturing |
| 32. | C213 | FT3404 | Pattern Engineering |
| 33. | C214 | FT3405 | Textile Chemical Processing |
| 34. | C215 | GE3451 | Environmental Sciences and Sustainability |
| 35. | C216 | FT3411 | Computer Aided Fashion Designing Laboratory |
| 36. | C217 | FT3412 | Basics of Pattern Engineering and Garment Construction Laboratory |
| 37. | C218 | FT3413 | Textile Chemical Processing Lab |
| 38. | C219 | FT3513 | Industrial training/Internship I |

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**Course Name: C101 Professional English - I**

**The students will be able to:**

| | |
|---|---|
| C101.1 | To use appropriate words in a professional context |
| C101.2 | To gain understanding of basic grammatical structures and use them in right context. |
| C101.3 | To read and interpret information presented in tables, charts and other graphic forms |
| C101.4 | To write definitions and descriptions. |
| C101.5 | To write narrations and essays on various topics. |

**Course Name: C102 Matrices and Calculus**

**The students will be able to:**

| | |
|---|---|
| C102.1 | Use the matrix algebra methods for solving practical problems. |
| C102.2 | Apply differential calculus tools in solving various application problems. |
| C102.3 | Able to use differential calculus ideas on several variable functions |
| C102.4 | Apply different methods of integration in solving practical problems. |
| C102.5 | Apply multiple integral ideas in solving areas, volumes and other practical problems. |

**Course Name: C103 Engineering Physics**

**The students will be able to:**

| | |
|---|---|
| C103.1 | Understand the importance of mechanics. |
| C103.2 | Express their knowledge in electromagnetic waves. |
| C103.3 | Demonstrate a strong foundational knowledge in oscillations, optics and lasers. |
| C103.4 | Understand the importance of quantum physics. |
| C103.5 | Comprehend and apply quantum mechanical principles towards the formation of energy bands. |

**Course Name: C104 Engineering Chemistry**

**The students will be able to:**

| | |
|---|---|
| C104.1 | To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water. |
| C104.2 | To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications. |
| C104.3 | To apply the knowledge of phase rule and composites for material selection requirements. |
| C104.4 | To recommend suitable fuels for engineering processes and applications |
| C104.5 | To recognize different forms of energy resources and apply them for suitable application in energy sectors. |

**Course Name: C105 Problem Solving and Python Programming**

**The students will be able to:**

| | |
|---|---|
| C105.1 | Develop algorithmic solutions to simple computational problems |
| C105.2 | Develop and execute simple Python programs |
| C105.3 | Write simple Python programs using conditionals and looping for solving problems |
| C105.4 | Decompose a Python program into functions. |
| C105.5 | Represent compound data using Python lists, tuples, dictionaries etc. |
| C105.6 | Read and write data from/to files in Python programs. |

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**Course Name: C106 Heritage of Tamil**

**The students will be able to:**

| | |
|---|---|
| C106.1 | To gain knowledge on language and literature. |
| C106.2 | To acquire knowledge about heritage - rock art paintings to modern art – sculpture |
| C106.3 | To gain knowledge about folk and martial arts |
| C106.4 | To understand about thinai concept of tamils. |
| C106.5 | To acquire knowledge about contribution of tamils to indian national movement and indian culture |

**Course Name: C107 Problem Solving and Python Programming Laboratory**

**The students will be able to:**

| | |
|---|---|
| C107.1 | Develop algorithmic solutions to simple computational problems |
| C107.2 | Develop and execute simple Python programs. |
| C107.3 | Implement programs in Python using conditionals and loops for solving problems. |
| C107.4 | Deploy functions to decompose a Python program. |
| C107.5 | Process compound data using Python data structures. |
| C107.6 | Utilize Python packages in developing software applications. |

**Course Name: C108 Physics and Chemistry Laboratory**

**The students will be able to:**

| | |
|---|---|
| C108.1 | Understand the functioning of various physics laboratory equipment |
| C108.2 | Use graphical models to analyze laboratory data |
| C108.3 | Use mathematical models as a medium for quantitative reasoning and describing physical reality |
| C108.4 | Access, process and analyze scientific information |
| C108.5 | Solve problems individually and collaboratively |

**Course Name: C109 English Laboratory**

**The students will be able to:**

| | |
|---|---|
| C109.1 | To listen to and comprehend general as well as complex academic texts information |
| C109.2 | To listen to and understand different points of view in a discussion |
| C109.3 | To speak fluently and accurately in formal and informal communicative contexts |
| C109.4 | To describe products and processes and explain their uses and purposes clearly and accurately |
| C109.5 | To express their opinions effectively in both formal and informal discussions |

**Course Name: C110 Professional English –II**

**The students will be able to:**

| | |
|---|---|
| C110.1 | To compare and contrast products and ideas in technical texts. |
| C110.2 | To identify and report cause and effects in events, industrial processes through technical texts |
| C110.3 | To analyze problems in order to arrive at feasible solutions and communicate them in the written format. |
| C110.4 | To present their ideas and opinions in a planned and logical manner |
| C110.5 | To draft effective resumes in the context of job search. |

**Course Name: C111 Statistics and Numerical Methods**

**The students will be able to:**

| | |
|---|---|
| C111.1 | Apply the concept of testing of hypothesis for small and large samples in real life |

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| | |
|---|---|
| | problems. |
| C111.2 | Apply the basic concepts of classifications of design of experiments in the field of agriculture. |
| C111.3 | Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. |
| C111.4 | Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. |
| C111.5 | Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications. |

**Course Name: C112 Fibre Science**

**The students will be able to:**

| | |
|---|---|
| C112.1 | Understand the process sequence of various fibres |
| C112.2 | Understand the properties of various regenerated fibres |
| C112.3 | Understand the properties of various syntheitc fibres |
| C112.4 | Acquaint knowledge on speciality fibres. |
| C112.5 | Acquaint knowledge on properties and end uses of functional speciality fibres. |

**Course Name: C113 Basic Electrical, Electronics and Instrumentation Engineering**

| | |
|---|---|
| C113.1 | Compute the electric circuit parameters for simple problems |
| C113.2 | Explain the concepts of domestics wiring and protective devices |
| C113.3 | Explain the working principle and applications of electrical machines |
| C113.4 | Analyze the characteristics of analog electronic devices |
| C113.5 | Explain the types and operating principles of sensors and transducers |

**Course Name:C114 Engineering Graphics**

**The students will be able to:**

| | |
|---|---|
| C114.1 | Use BIS conventions and specifications for engineering drawing. |
| C114.2 | Construct the conic curves, involutes and cycloid. |
| C114.3 | Solve practical problems involving projection of lines |
| C114.4 | Draw the orthographic, isometric and perspective projections of simple solids. |
| C114.5 | Draw the development of simple solids. |

**Course Name: C115 Chemistry for Textile Technologists**

**The students will be able to:**

| | |
|---|---|
| C115.1 | Understand and apply spectroscopic techniques for the analysis of engineering materialsfor their end use applications |
| C115.2 | Make use of the applications of adsorption in detergency, wetting, spreading, foaming,de- foaming, and water repellence and separation processes |
| C115.3 | Analyse and estimate oils, fats, lubricants and soap for their intended applications |
| C115.4 | Distinguish and demonstrate the role of different types of chemicals and auxiliaries |
| C115.5 | Realize the chemical structures, properties and relationships of different types of dyesand their applications |

**Course Name: C116 Tamils and Technology**

**The students will be able to:**

| | |
|---|---|
| C116.1 | Gain knowledge about weaving and ceramic technology |

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| | |
|---|---|
| C116.2 | Understand about design and construction technology |
| C116.3 | Acquire knowledge about manufacturing technology |
| C116.4 | Gain knowledge about agriculture and irrigation technology |
| C116.5 | Acquire knowledge about scientific tamil & tamil computing |

**Course Name: C117 Engineering Practice Laboratory**

**The students will be able to:**

| | |
|---|---|
| C117.1 | Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work |
| C117.2 | Wire various electrical joints in common household electrical wire work |
| C117.3 | Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work |
| C117.4 | Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB |

**Course Name: C118 Basic Electrical, Electronics and Instrumentation Engineering Laboratory**

**The students will be able to:**

| | |
|---|---|
| C118.1 | Use experimental methods to verify the Ohm's law and Kirchhoff's Law and to measure three phase power |
| C118.2 | Analyze experimentally the load characteristics of electrical machines |
| C118.3 | Analyze the characteristics of basic electronic devices |
| C118.4 | Use LVDT to measure displacement |

**Course Name: C119 Communication Laboratory**

**The students will be able to:**

| | |
|---|---|
| C119.1 | Speak effectively in group discussions held in a formal/semi formal contexts. |
| C119.2 | Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions. |
| C119.3 | Write emails, letters and effective job applications. |
| C119.4 | Write critical reports to convey data and information with clarity and precision |
| C119.5 | Give appropriate instructions and recommendations for safe execution of tasks. |

**Course Name: C201 Probability and statistical methods**

**The students will be able to:**

| | |
|---|---|
| C201.1 | Use the Probability techniques for solving practical problems. |
| C201.2 | Apply two dimensional random variable tools in solving various problems |
| C201.3 | Able to solve differential Equations by applying various techniques |
| C201.4 | Apply different methods of Correlation, Regression, Index Numbers and Times seriesanalysis in solving practical problems |
| C201.5 | Apply statistical techniques in solving manufacturing and management related problems |

**Course Name: C202 Characteristics of Textile Fibres**

**The students will be able to:**

| | |
|---|---|
| C202.1 | Investigate and identify fibers based on their morphological structure |
| C202.2 | Identify the factors influencing moisture and heat sorption behavior of fibres |

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| | |
|---|---|
| C202.3 | Identify the factors influencing tensile and elongation behavior of fibres |
| C202.4 | Understand the elastic recovery behaviour of fibres |
| C202.5 | Understand and measure the optical, frictional, and thermal characteristics of fibres |

**Course Name: C203 TECHNOLOGY OF SPINNING PROCESSES**

**The students will be able to:**

| | |
|---|---|
| C203.1 | Infer the short staple spinning process and machineries |
| C203.2 | Infer the combing process to produce combed cotton yarn |
| C203.3 | Outline the process of open-end spinning |
| C203.4 | Apply the spinning concepts in fancy yarns and product diversifications |
| C203.5 | Outline the process of specialty spinning |

**Course Name: C204 FABRIC MANUFACTURING**

**The students will be able to:**

| | |
|---|---|
| C204.1 | Describe the objectives and principles of winding, warping machines and the objectives of sizing |
| C204.2 | Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom |
| C204.3 | Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection |
| C204.4 | Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines |
| C204.5 | Explain the principles involved in web preparation, bonding and finishing of nonwoven fabrics |

**Course Name: C205 Fabric Structures**

**The students will be able to:**

| | |
|---|---|
| C205.1 | Design and describe the construction of basic weaves and simple weaves |
| C205.2 | Design and describe the construction of compound weaves |
| C205.3 | Design and describe the construction of pile weaves, jacquard designs, and define the commercial names of woven fabrics |
| C205.4 | Design and describe the weft knit structures |
| C205.5 | Design and describe the warp knit structures and define the commercial names of knitted fabrics |

**Course Name: C206 Concepts and Evolution of Fashion and Design**

**The students will be able to:**

| | |
|---|---|
| C206.1 | Development of textile designs and garment designs |
| C206.2 | Adapt elements & principles of design in context to Textiles and Apparels |
| C206.3 | Basic concepts of fashion fundamental and terminology |
| C206.4 | Identify the traditional world costumes and textiles of India |
| C206.5 | Summarize the traditional Indian textiles, embroideries and printing |

**Course Name: C207 Fabric Structure Laboratory**

**The students will be able to:**

| | |
|---|---|
| C207.1 | Identify the constructional parameters of woven fabric |
| C207.2 | Construct design, draft and peg plan for woven fabrics |
| C207.3 | Analyse the construction of Weft and warp knitted structures |
| C207.4 | Analyze the structure of nonwoven fabrics |
| C207.5 | Analysis of the non-woven structures |

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**Course Name: C208 Fashion Illustration Laboratory**

**The students will be able to:**

| | |
|---|---|
| C208.1 | To develop motifs, draw objects and shade them |
| C208.2 | To illustrate fabric drapes and shading with different color mediums |
| C208.3 | To illustrate different fabric swatches and garment components |
| C208,4 | To understand human anatomy and illustrate basic figures |
| C208.5 | To create a mood board based on a selected theme and develop garment designs |

**Course Name: C209 Professional Development**

**The students will be able to:**

| | |
|---|---|
| C209.1 | Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements |
| C209.2 | Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding |
| C209.3 | Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects |

**Course Name: C210 Apparel Production Machinery**

**The students will be able to:**

| | |
|---|---|
| C210.1 | Different types of fabric laying methods, spreading machines and its control methods |
| C210.2 | Different types of cutting machines and its control methods |
| C210.3 | Sewing machine and its basic parts, functions and its safety measures |
| C210.4 | Different types of multi thread sewing machines and its purpose |
| C210.5 | Special sewing machines, its purpose and control measures |

**Course Name: C211 Fabric and Garment Quality Evaluation**

**The students will be able to:**

| | |
|---|---|
| C211.1 | Identification of construction characteristics and sampling methods |
| C211.2 | Evaluation of mechanical characteristics |
| C211.3 | Evaluation of serviceable properties |
| C211.4 | Evaluation of low stress mechanical characteristics |
| C211 .5 | Fabric and garment inspection |

**Course Name: C212 Fundamentals of Garment Manufactring**

**The students will be able to:**

| | |
|---|---|
| C212.1 | Understand the structure of apparel industry and production planning |
| C212.2 | Define and classify the types of accessories, trims, stitches, seams |
| C212.3 | Explain Inspection, spreading and cutting processes |
| C212.4 | Discuss the production systems followed in apparel manufacturing |
| C212.5 | Explain apparel finishing process and packaging |

**Course Name: C213 Pattern Engineering**

**The students will be able to:**

| | |
|---|---|
| C213.1 | Understand Anthropometry concepts and important body measurements |
| C213.2 | Prepare patterns for basic blocks using drafting and draping techniques |
| C213.3 | Develop grading and in pattern alteration |
| C213.4 | Apply dart manipulation techniques to design, variation in garment components |
| C213.5 | Prepare patterns for basic collar and sleeve components |

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**Course Name: C214 Textile Chemical Processing**

**The students will be able to:**

| | |
|---|---|
| C214.1 | Explain the preparatory process in chemical processing |
| C214.2 | Explain the classes, machines, stages, and application of dyes |
| C214.3 | Discuss about the ingredients, types and machines and faults in printing |
| C214.4 | Understand the various methods and application of finishing |
| C214.5 | Understand the measurement of strength of colour and colour difference |

**Course Name: C215 Environmental Sciences and Sustainability**

**The students will be able to:**

| | |
|---|---|
| C215.1 | To recognize and understand the functions of environment, ecosystems and biodiversityand their conservation. |
| C215.2 | To identify the causes, effects of environmental pollution and natural disasters andcontribute to the preventive measures in the society |
| C215.3 | To identify and apply the understanding of renewable and non-renewable resources andcontribute to the sustainable measures to preserve them for future generations. |
| C215.4 | To recognize the different goals of sustainable development and apply them for suitabletechnological advancement and societal development |
| C215.5 | To demonstrate the knowledge of sustainability practices and identify green materials,energy cycles and the role of sustainable urbanization |

**Course Name: C216 Computer Aided Fashion Designing Laboratory**

**The students will be able to:**

| | |
|---|---|
| C216.1 | To develop textile print design |
| C216.2 | To develop fabric design |
| C216.3 | To develop technical drawings |
| C216.4 | To illustrate different kid's garments |
| C216.5 | To illustrate different men's and women's garments |

**Course Name: C217 Basics of Pattern Engineering and Garment Construction Laboratory**

**The students will be able to:**

| | |
|---|---|
| C217.1 | To take basic body measurements and then drafting and grading of basic patterns |
| C217.2 | To learn the different techniques of pattern making and prepare different patterns |
| C217.3 | To prepare patterns using the draping techniques |
| C217.4 | To prepare samples for seams and stitches |
| C217.5 | To prepare samples for fullness, necklines and plackets |

**Course Name: C218 Textile Chemical Processing Laboratory**

**The students will be able to:**

| | |
|---|---|
| C218.1 | Investigate and identify fibers and dyes |
| C218.2 | Do bleaching, dyeing and printing process |
| C218.3 | Estimate and apply chemicals and dyes for processing the textile materials |
| C218.4 | Apply the different types of finishes for the chemical processing |
| C218.5 | Evaluate fastness properties of dyed materials |

**Course Name: C219 Industrial Training / Internship I**

**The students will be able to:**

| | |
|---|---|
| C219.1 | Plant layout, machinery, organizational structure and production processes in the firm or research facilities in the laboratory/research institute |

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| | |
|---|---|
| C219.2 | Analysis of industrial / research problems and their solutions |
| C219.3 | Documenting of material specifications, machine and process parameters, testing parameters and results |
| C219.4 | Preparing of Technical report and presentation |

**Course Name: C301 Garment Construction**

**The students will be able to:**

| | |
|---|---|
| C301.1 | Patterns and construction for garment components |
| C301.2 | Patterns and construction for kid's wear |
| C301.3 | Patterns and construction for men Wear |
| C301.4 | Patterns and construction for Women's wear |
| C301.5 | Pattern and construction of women's bottoms and intimate apparel |

**Course Name: C302 Apparel Production Planning and Process Control**

**The students will be able to:**

| | |
|---|---|
| C302.1 | Process control in garment manufacture |
| C302.2 | Production planning, line balancing |
| C302.3 | Lay planning process |
| C302.4 | Material management techniques and |
| C302.5 | Quality control in garment manufacture |

**Course Name: C303 Apparel Product Development**

**The students will be able to:**

| | |
|---|---|
| C303.1 | Develop fashion concept for apparel |
| C303.2 | Understand functional apparel design and engineering |
| C303.3 | Understand line development and presentation |
| C303.4 | Analyze of product development |
| C303.5 | Develop garment prototype |

**Course Name: C304 Visual Merchandising**

**The students will be able to:**

| | |
|---|---|
| C304.1 | Classify various elements of Visual presentation and understand their significance in visually presenting a display |
| C304.2 | Analyze and identify the best suitable environment for merchandise including interior, exterior and point of displays |
| C304.3 | Appraise on various techniques used in presenting merchandise |
| C304.4 | Plan on optimizing the merchandise and retail space to customers |
| C304.5 | Summarize the various features available in a computer controlled visual merchandising |

**Course Name: C305 Apparel trims, Accessories and Embellishments**

**The students will be able to:**

| | |
|---|---|
| C305.1 | Different types of garment components and trims |
| C305.2 | Different types of Zippers |
| C305.3 | Embroideries - Indian and tribal |
| C305.4 | Fashion accessories |
| C305.5 | Different types of printing |

**Course Name: C306 Disaster Risk Reduction and Management**

**The students will be able to:**

| | |
|---|---|
| C306.1 | To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction(DRR) |

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| | |
|---|---|
| C306.2 | To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessmentprevention and risk reduction |
| C306.3 | To develop disaster response skills by adopting relevant tools and technology |
| C306.4 | Enhance awareness of institutional processes for Disaster response in the country |
| C306.5 | Develop rudimentary ability to respond to their surroundings with potential Disaster responsein areas where they live, with due sensitivity |

**Course Name: C307 Garment Construction Laboratory I**

**The students will be able to:**

| | |
|---|---|
| C307.1 | Develop samples in various special machines |
| C307.2 | Develop various garment components |
| C307.3 | Develop various children's garments and basic women's garments |

**Course Name: C308 Computer Aided Garment Designing Laboratory**

**The students will be able to:**

| | |
|---|---|
| C308.1 | To digitize and develop graded patterns for kid's wear |
| C308.2 | To digitize and develop graded patterns for men's wear |
| C308.3 | To digitize and develop graded patterns for women's wear |
| C308.4 | To prepare marker planning |
| C308.5 | To calculate fabric consumption and to develop cut order plan |

**Course Name: C309 Industrial Training / Internship I**

**The students will be able to:**

| | |
|---|---|
| C309.1 | Plant layout, machinery, organizational structure and production processes in the firm or research facilities in the laboratory/research institute |
| C309.2 | Analysis of industrial / research problems and their solutions |
| C309.3 | Documenting of material specifications, machine and process parameters, testing parameters and results |
| C309.4 | Preparing of Technical report and presentation |

**Course Name: C310 Apparel Marketing and Merchandising**

**The students will be able to:**

| | |
|---|---|
| C310.1 | Explain the international apparel business and role of Asian countries in the apparel andfashion trade |
| C310.2 | Apply the concepts of marketing in the apparel industry |
| C310.3 | Explain the concepts of merchandising and new product development |
| C310.4 | Explain the apparel product dynamics in a market and relateit along the value chain. |
| C310.5 | Understand Export documentation and policies |

**Course Name: C311 Industrial Engineering In Garment Manufacturing**

**The students will be able to:**

| | |
|---|---|
| C311.1 | Understand the basics of industrial engineering and productivity concepts |
| C311.2 | Method study and its techniques |
| C311.3 | Apply work measurement |
| C311.4 | Understand the concepts of layout and line balancing |
| C311.5 | Interpret the result using statistical process control |

**Course Name: C312 IOT Concepts and Applications**

**The students will be able to:**

| | |
|---|---|
| C312.1 | Explain the concept of IoT |
| C312.2 | Understand the communication models and various protocols for IoT |

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| | |
|---|---|
| C312.3 | Design portable IoT using Arduino/Raspberry Pi /open platform |
| C312.4 | Apply data analytics and use cloud offerings related to IoT |
| C312.5 | Analyze applications of IoT in real time scenario |

**Course Name: C313 Garment Finishing and Care**

**The students will be able to:**

| | |
|---|---|
| C313.1 | Garment dyeing and wash treatments |
| C313.2 | Finishing of fabrics for special end uses |
| C313.3 | Garment finishing room equipment |
| C313.4 | Stain removal |
| C313.5 | Garment care |

**Course Name: C314 Home Textiles**

**The students will be able to:**

| | |
|---|---|
| C314.1 | Different types of materials used as home textiles |
| C314.2 | Selection of fabric and design for living room, bed room and kitchen furnishings |
| C314.3 | Selection of floor coverings and draperies |
| C314.4 | Finishes used for various home textile products |
| C314.5 | Evaluation of home textile products |

**Course Name: C315 Knit Product Development**

**The students will be able to:**

| | |
|---|---|
| C315.1 | Different types of knitted materials and their application |
| C315.2 | Selection of stitches, seams and machine for the construction of children's wear |
| C315.3 | Selection of stitches, seams and machine for the construction of women's wear |
| C315.4 | Selection of stitches, seams and machine for the construction of men's wear |
| C315.5 | Selection of stitches, seams and machine for the construction of intimate apparels |

**Course Name: C316 Industrial Safety**

**The students will be able to:**

| | |
|---|---|
| C316.1 | Understand the basic concept of safety |
| C316.2 | Obtain knowledge of Statutory Regulations and standards |
| C316.3 | Know about the safety Activities of the Working Place |
| C316.4 | Analyze on the impact of Occupational Exposures and their Remedies |
| C316.5 | Obtain knowledge of Risk Assessment Techniques |

**Course Name: C317 Garment Construction Laboratory II**

**The students will be able to:**

| | |
|---|---|
| C317.1 | Develop samples in various special machines |
| C317.2 | Design and development of patterns for women's wear |
| C317.3 | Design and development of patterns for men's wear |
| C317.4 | Construction process for women's wear |
| C317.5 | Construction process for men's wear |

**Course Name: C318 Design collection / Portfolio**

**The students will be able to:**

| | |
|---|---|
| C318.1 | Design research process and conceptualization |
| C318.2 | Prepare theme/inspiration and mood board |
| C318.3 | Prepare client, color and look board |
| C318.4 | Prepare fabrics, trims and design board |

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| | |
|---|---|
| C318.5 | Develop product for men's and women's wear |

**Course Name: C319 Industrial Training / Internship II**

**The students will be able to:**

| | |
|---|---|
| C319.1 | Plant layout, machinery, organizational structure and production processes in the firm orresearch facilities in the laboratory/research institute |
| C319.2 | Analysis of industrial / research problems and their solutions |
| C319.3 | Documenting of material specifications, machine and process parameters, testingparameters and results |
| C319.4 | Preparing of Technical report and presentation |

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# MASTER OF BUSINESS ADMINISTRATION

## Anna University Regulation 2021

### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | BA 4101 | Statistics For Management |
| 2. | C102 | BA 4102 | Management Concepts And Organizational Behaviour |
| 3. | C103 | BA 4103 | Managerial Economics |
| 4. | C104 | BA 4104 | Accounting For Decision Making |
| 5. | C105 | BA 4105 | Legal Aspects Of Business |
| 6. | C106 | BA 4106 | Information Management |
| 7. | C107 | BA 4033 | Event Management |
| 8. | C108 | BA 4111 | Indian Ethos(Seminar) |
| 9. | C109 | BA 4112 | Business Communication (Laboratory) |
| 10. | C111 | BA 4201 | Quantitative Techniques For Decision Making |
| 11. | C112 | BA 4202 | Financial Management |
| 12. | C113 | BA 4203 | Human Resource Management |
| 13. | C114 | BA 4204 | Operations Management |
| 14. | C115 | BA 4205 | Business Research Methods |
| 15. | C116 | BA 4206 | Business Analytics |
| 16. | C117 | BA 4207 | Marketing Management |
| 17. | C118 | BA 4212 | Business Ethics (Seminar) |
| 18. | C119 | BA 4212 | Data Analysis And Business Modeling (Lab) |
| 19. | C201 | BA 4301 | Strategic Management |
| 20. | C202 | BA 4302 | International Business |
| 21. | C203 | BA 4001 | Security Analysis And Portfolio Management |
| 22. | C204 | BA 4002 | Financial Markets |
| 23. | C205 | BA 4003 | Banking And Financial Services |
| 24. | C206 | BA 4010 | Integrated Marketing Communication |
| 25. | C207 | BA 4011 | Services Marketing |
| 26. | C208 | BA 4014 | Digital Marketing |
| 27. | C209 | BA 4015 | Strategic Human Resource Management |
| 28. | C210 | BA 4016 | Industrial Relations And Labour Legislations |
| 29. | C211 | BA 4020 | International Human Resource Management |
| 30. | C212 | BA 4311 | Creativity And Innovation Laboratory |
| 31. | C213 | BA 4312 | Summer Internship |
| 32. | C214 | BA 4411 | Project Work |

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**Course Name: C101 (STSTISTICS FOR MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C101.1 | Facilitate objective solutions in business decision making . |
| C101.2 | Understand and solve business problems. |
| C101.3 | Apply statistical techniques to data sets, and correctly interpret the results. |
| C101.4 | Develop skill-set that is in demand in both the research and business environments. |
| C101.5 | Enable the students to apply the statistical techniques in a work setting. |

**Course Name: C102 (MANAGEMENT CONCEPTS AND ORGANIZATIONAL BEHAVIOUR)**

Students will be able to

| | |
|---|---|
| C102.1 | Understanding of various management concepts and skills required in the business world |
| C102.2 | Know the in-depth knowledge of various functions of management in a real time management context |
| C102.3 | Understanding of the complexities associated with management of individual behavior in the organizations |
| C102.4 | Develop the skill set to have manage group behaviour in Organizations |
| C102.5 | Insights about the current trends in managing organizational behaviour |

**Course Name: C103 (MANAGERIAL ECONOMICS)**

Students will be able to

| | |
|---|---|
| C103.1 | Introduce the concepts of scarcity and efficiency; |
| C103.2 | Explain principles of microeconomics relevant to managing an organization |
| C103.3 | Describe principles of macroeconomics |
| C103.4 | Have the understanding of economic environment of business. |
| C103.5 | Study about the policies that regulate economic variables |

**Course Name: C104 (ACCOUNTING FOR DECISION MAKING)**

Students will be able to

| | |
|---|---|
| C104.1 | A thorough grounding of financial accounting concepts |
| C104.2 | Preparation of financial statement analysis |
| C104.3 | Understand the management and cost accounting techniques |
| C104.4 | Apply the management and cost accounting techniques for decision making |
| C104.5 | Assess the accountancy standards of practices in India |

**Course Name: C105 (LEGAL ASPECTS OF BUSINESS)**

Students will be able to

| | |
|---|---|
| C105.1 | Understand the fundamental legal principles in developing various contracts and commercial laws in the business world |
| C105.2 | Identify the common forms of business associations and elements of Corporate Governance |
| C105.3 | Develop insights regarding the laws related to industrial environment |
| C105.4 | Ability to understand the fundamentals of corporate tax and GST |
| C105.5 | Understand the role of consumer rights and cyber laws in the modern business environment |

**Course Name: C106 (INFORMATION MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C106.1 | Learn the basics of data and information system |
| C106.2 | Understand the system development methodologies |

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| | |
|---|---|
| C106.3 | Understand database management system and its types. |
| C106.4 | Learn the various technologies in information system and its security. |
| C106.5 | Gains knowledge on effective applications of information systems in business. |

**Course Name: C107 (EVENT MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C107.1 | Learning about structure and code of ethics of events |
| C107.2 | Exploring and getting to know about event planning and regulations |
| C107.3 | Understand about event marketing, planning and strategies |
| C107.4 | Enhance professional skills in event management |
| C107.5 | Analyse the safety measure of event management |

**Course Name: C108 (INDIAN ETHOS)**

Students will be able to

| | |
|---|---|
| C108.1 | Apply the basic concepts of Indian ethos and value systems at work. |
| C108.2 | Handle issues of business ethics and offer solutions in ethical perspectives . |
| C108.3 | Manage professionally efficient and skilful in value systems and culture |
| C108.4 | The Capable in ethically manage business towards well being of the society. |
| C108.5 | Know the socially effective in undertaking business responsibilities. |

**Course Name: C109 (BUSINESS COMMUNICATION (LABORATORY))**

Students will be able to

| | |
|---|---|
| C109.1 | Develop good managerial communication skills |
| C109.2 | Ability to excel in different forms of written communication required in a business context |
| C109.3 | Develop good presentation skills |
| C109.4 | Get In-depth understanding of interview skills |
| C109.5 | Ability to prepare Business reports |

**Course Name: C111 (QUANTITATIVE TECHNIQUES FOR DECISION MAKING)**

Students will be able to

| | |
|---|---|
| C111.1 | Know the Linear programming in product mix decisions |
| C111.2 | Know the Transportation and assignment in logistics and job allocation scenarios |
| C111.3 | Learn the Game theory and heuristics of decision making in real time decisions |
| C111.4 | Know the Inventory management and replacement models in manufacturing context |
| C111.5 | Know the Queuing and simulation in real time scenario optimization |

**Course Name: C112 (FINANCIAL MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C112.1 | Identify the concepts of financial decision of an organization |
| C112.2 | Recognize the time value of money |
| C112.3 | Learn the capital budgeting and cost of capital techniques |
| C112.4 | Understand how to decide the decision of capital structure and distribution of dividend |
| C112.5 | Assess the short-term and long-term sources of finance |

**Course Name: C113 (HUMAN RESOURCE MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C113.1 | Gained knowledge on the various aspects of HRM |
| C113.2 | Knowledge needed for success as a human resources professional |
| C113.3 | Develop the skills needed for a successful HR manager |

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| | |
|---|---|
| C113.4 | Prepared to implement the concepts learned in the workplace. |
| C113.5 | Aware of the emerging concepts in the field of HRM |

**Course Name: C114 (OPERATIONS MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C114.1 | Understanding of the evolution of operations management practices and world class manufacturing processes |
| C114.2 | Knowledge about capacity planning, strategic sourcing and procurement in organizations |
| C114.3 | Enhances the understanding of product development and design process |
| C114.4 | Ability to forecast demand and overcome bottlenecks |
| C114.5 | Provides insight to Quality management tools and practices. |

**Course Name: C115 (BUSINESS RESEARCH METHODS)**

Students will be able to

| | |
|---|---|
| C115.1 | Understand and appreciate scientific inquiry |
| C115.2 | Know to write research proposals |
| C115.3 | Undertake a systematic outlook towards business situations for the purpose of objective decision making, and the method of conducting scientific inquiry to solve organizational problems |
| C115.4 | Analyze data and find solutions to the problems. |
| C115.5 | Prepare research reports |

**Course Name: C116 (BUSINESS ANALYTICS)**

Students will be able to

| | |
|---|---|
| C116.1 | Understand the role of Business Analytics in decision making |
| C116.2 | Identify the appropriate tool for the analytics scenario |
| C116.3 | Apply the descriptive analytics tools and generate solutions |
| C116.4 | Understand the Predictive Analytics and applications |
| C116.5 | Gain knowledge of Prescriptive Analytics and demonstrating business process improvement |

**Course Name: C117 (MARKETING MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C117.1 | Apply the knowledge of contemporary marketing theories to the demands of business and management practice. |
| C117.2 | Enhanced knowledge of marketing strategies for consumer and industrial marketing |
| C117.3 | Deep understanding of choice of marketing mix elements and managing integrated marketing channels |
| C117.4 | Analyze the nature of consumer buying behaviour |
| C117.5 | Understanding of the marketing research and new trends in the arena of marketing |

**Course Name: C118 (BUSINESS ETHICS)**

Students will be able to

| | |
|---|---|
| C118.1 | Handle issues of business ethics and offer solutions ethical perspectives |
| C118.2 | Apply the basic concepts of Indian ethos and values at work. |
| C118.3 | Handle issues of business ethics and offer solutions in ethical perspectives |
| C118.4 | Professionally efficient and skilful in value systems and culture |
| C118.5 | Learn the capable in ethically manage business towards well being of the society. |

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**Course Name: C118 (DATA ANALYSIS AND BUSINESS MODELING)**

Students will be able to

| | |
|---|---|
| C118.1 | Get deep knowledge about the nature of data and conducting hypothesis testing using various data analysis techniques |
| C118.2 | Facilitates to identify the relationship between variables using data analytical tools |
| C118.3 | Provides understanding about forecasting in real time business world using analytical tools |
| C118.4 | Conduct Risk and sensitivity analysis and portfolio selection based on business data |
| C118.5 | Enhances knowledge about networking, inventory models and queuing theory using data analytical tools |

**Course Name: C201 (STRATEGIC MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C201.1 | Understand the Strategic management process and social responsibility of business organizations |
| C201.2 | In-depth understanding about the need for developing competitive advantage for organizations |
| C201.3 | Provides insights into various corporate and business level strategies |
| C201.4 | Facilitates to identify the various control systems required for organizational strategy implementation process |
| C201.5 | Enhances the cognitive knowledge about various strategic issues and development of new business models |

**Course Name: C202 (INTRNATIONAL BUSINESS)**

Students will be able to

| | |
|---|---|
| C202.1 | Get in depth knowledge of driving factors of international Business |
| C202.2 | Understanding of theories of trade and investment practiced in the global world |
| C202.3 | Deep Insights in to various market entry strategies followed by Global Organizations |
| C202.4 | Identify the various global production and supply chain issues and have an understanding of foreign exchange determination system |
| C202.5 | Enhance the cognitive knowledge of managing business across the cultures |

**Course Name: C203 (SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C203.1 | Understand the concept of investment and identify the investment alternatives to investors |
| C203.2 | Learn the nuances of fundamental analyses and technical analyses |
| C204.3 | Analyse and evaluate the value of securities |
| C205.4 | Explain how to construct an efficient portfolio |
| C206.5 | Explore the various methods through which portfolio evaluation could be done |

**Course Name: C204 (FINANCIAL MARKETS)**

Students will be able to

| | |
|---|---|
| C204.1 | Understanding the basic concepts of the finance markets in India |
| C204.2 | Identify the underlying structure and functions of Indian financial markets |
| C204.3 | Familiarize the methods of issuing shares and the role of intermediaries in the primary market |
| C204.4 | Learn about the trading mechanism in stock market |
| C204.5 | Describe the instruments, participants and trading in debt market |

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**Course Name: C205 (BANKING AND FINANCIAL SERVICES)**

Students will be able to

| | |
|---|---|
| C205.1 | Understand the overall structure and functions of Indian Financial System |
| C205.2 | Gain knowledge about regulations governing the Indian Banking system |
| C205.3 | Analyse the Price various types of loans proposed by banks to various prospective borrowers with different risk profiles and evaluate the performance of banks |
| C205.4 | Familiarize the students with the concept of e-banking |
| C205.5 | In-depth understanding of fee-based and fund-based financial services in India |

**Course Name: C206 (INTEGRATED MARKETING COMMUNICATION)**

Students will be able to

| | |
|---|---|
| C206.1 | Review and give a general understanding of the basics of traditional communication forms, such as advertising, personal selling, sales promotion and indirect promotion within various delivery vehicles from broadcast to targeted social media. |
| C206.2 | This course introduces students to the essential concepts and techniques for the development and designing an effective Integrated Marketing Communication programme. |
| C206.3 | Know how IMC fits into the marketing mix. |
| C206.4 | Develop awareness about marketing communications tools, and how each can be used effectively- individually or in an integrated mix. |
| C206.5 | Examine the process by which integrated marketing communications programs are planned, developed, executed and measured |

**Course Name: C207 (SERVICES MARKETING)**

Students will be able to

| | |
|---|---|
| C207.1 | Demonstrate an extended understanding of the similarities and differences in service-based and physical product based marketing activities |
| C207.2 | Develop and justify marketing planning and control systems appropriate to service-based activities. |
| C207.3 | Demonstrate integrative knowledge of marketing issues associated with service productivity, perceived quality, customer satisfaction and loyalty |
| C207.4 | Develop blueprint for the services sector and develop a better appreciation of the necessary strategies to create a service excellence. |
| C207.5 | Recognize the challenges faced in services delivery as outlined in the services gap model. |

**Course Name: C208 (DIGITAL MARKETING)**

Students will be able to

| | |
|---|---|
| C208.1 | Examine and explore the role and importance of digital marketing in today's rapidly changing business environment. |
| C208.2 | Focuses on how digital marketing can be utilized by organizations and how its effectiveness can measure. |
| C208.3 | Know the key elements of a digital marketing strategy |
| C208.4 | Study how the effectiveness of a digital marketing campaign can be measured |
| C208.5 | Demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs. |

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**Course Name: C209 (STRATEGIC HUMAN RESOURCE MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C209.1 | Understand the relationship of HR strategy with overall corporate strategy, the strategic role of specific HR systems. |
| C209.2 | Appreciate SHRM in the context of changing forms of organization and will have a better understanding of the tools and techniques used by organizations to meet current challenges |
| C209.3 | Be more sensitive to cross-cultural issues and understanding of international approaches to dealing with people in organizations. Students will look at HRM in a broader, comparative and international perspective to deal with complex issues and manifold risks. |
| C209.4 | Providing an overview of the counseling and coaching processes and techniques, Developing alternative approach to dealing with problem situations in organisations |
| C209.5 | Understand the career development theories and models and gain necessary self-insight, skills and techniques to become effective HR managers |

**Course Name: C210 (INDUSTRIAL RELATIONS AND LABOUR LEGISLATIONS)**

Students will be able to

| | |
|---|---|
| C210.1 | Know the industrial relations system and Trade unions |
| C210.2 | Know the Industrial Disputes and labour welfare measures |
| C210.3 | Learn Labour legislation introduction and legal provisions for factory workers, wages and Bonus |
| C210.4 | Know the Legal provisions for equal remuneration, gratuity, compensation, industrial employment and Apprenticeship |
| C210.5 | Know the Legal provisions for EPF, ESI, Maternity, contract labours, and child labour prevention. |

**Course Name: C211 (INTERNATIONAL HUMAN RESOURCE MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C211.1 | The basics of IHRM, models and practices |
| C211.2 | Strategic orientation and cultural context towards IHRM |
| C211.3 | International practices on recruitment and selection |
| C211.4 | International perspectives on Training, development, performance appraisal |
| C211.5 | International practices on Compensation management |

**Course Name: C212 (CREATIVITY AND INNOVATION LABOURATORY)**

Students will be able to

| | |
|---|---|
| C212.1 | Provides insights about approaches to creativity and innovation |
| C212.2 | Understanding of heuristic models and its applications |
| C212.3 | Enhances the knowledge of nature of creativity |
| C212.4 | Ability to apply creativity in problem solving |
| C212.5 | Knowledge about radical and disruptive models of innovation |

**Course Name: C213 (DATA MINING FOR BUSINESS INTELLIGENCE)**

Students will be able to

| | |
|---|---|
| C213.1 | Learn to apply various data mining techniques into various areas of different domains. |
| C213.2 | Interact competently on the topic of data mining for business intelligence.<br>Know the basics of data mining processes, algorithms, & systems well enough to interact |

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| | |
|---|---|
| | with CTOs, expert data miners, consultants, etc. |
| C213.3 | Apply various prediction techniques. |
| C213.4 | Learn about supervised and unsupervised learning technique. |
| C213.5 | Develop and implement a basic trainable neural network (or) a fuzzy logic system to design and manufacturing. |

**Course Name: C214 (E-BUSINESS MANAGEMENT)**

Students will be able to

| | |
|---|---|
| C214.1 | Build and manage an e-business. |
| C214.2 | Knowledge about Technology Infrastructure |
| C214.3 | Understanding of customer oriented business applications |
| C214.4 | Knowledge of e business payment protocols and security |
| C214.5 | Understanding of ethical, legal , privacy issues and encryption policies |

**Course Name: C215 (ENTERPRISE RESOURCE PLANNING)**

Students will be able to

| | |
|---|---|
| C215.1 | Knowledge of risk and benefits associated with Enterprise Resource Planning. |
| C215.2 | Knowledge or ERP solutions and functional modules. |
| C215.3 | Exposure to the implementation environment. |
| C215.4 | Understanding of post implementation of impact and maintenance of ERP. |
| C215.5 | Knowledge of emerging trends on ERP. |

**Course Name: C216 (SUMMER INTERNSHIP)**

Students will be able to

| | |
|---|---|
| C213.1 | Understanding the functions of the departments of an organization. Understand and identify problems in the industry and society. |
| C213.2 | Learn on the fundamentals of the research. |
| C213.3 | Learn on the various methods of collecting, segmenting and analyzing data. |
| C213.4 | Learn to critically analyze the findings of the research and interpret the same for the benefit of the corporate or society. |
| C213.5 | Learn to prepare and present a detailed report of the research work done. |

**Course Name: C214 (PROJECT WORK)**

Students will be able to

| | |
|---|---|
| C213.1 | Identify authentic business problems with an aim to solving the same within the stipulated time |
| C213.2 | Undertake research using appropriate recognized methodology and framework |
| C213.3 | Assess meaningful entrepreneurial opportunities from a business and personal perspective |
| C213.4 | Gain exposure while doing survey |
| C213.5 | Expand their knowledge base with literature review on the current topic |

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## M.E-APPLIED ELECTRONICS
### Anna University Regulation 2021
### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | MA4101 | Applied Mathematics for Electronics Engineers |
| 2. | C102 | RM4151 | Research Methodology and IPR |
| 3. | C103 | AP4151 | Advanced Digital Signal Processing |
| 4. | C104 | AP4152 | Advanced Digital System Design |
| 5. | C105 | AP4153 | Semiconductor Devices and Modeling |
| 6. | C106 | VL4152 | Digital CMOS VLSI Design |
| 7. | C107 | AP4111 | Electronics System Design Laboratory |
| 8. | C108 | AP4112 | Signal Processing Laboratory |
| 9. | C109 | AP4201 | Analog and Mixed Signal IC Design |
| 10. | C110 | AP4251 | Industrial Internet of Things |
| 11. | C111 | AP4202 | Power Conversion Circuits for Electronics |
| 12. | C112 | AP4203 | Embedded Systems |
| 13. | C113 | AP4071 | Computer Architecture and Parallel Processing |
| 14. | C114 | AP4003 | VLSI Design Techniques |
| 15. | C115 | AP4211 | VLSI Design Laboratory |
| 16. | C116 | AP4212 | Mini Project with seminar |
| 17. | C201 | CU4076 | VLSI for wireless communication |
| 18. | C202 | AP4073 | Sensors and Actuators |
| 19. | C203 | AP4011 | Advanced Digital Image Processing |
| 20. | C204 | OCE434 | Environmental Impact Assessment |
| 21. | C205 | AP5311 | Project Work Phase I |
| 22. | C206 | AP5411 | Project Work Phase II |

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**Course Name: C101** (Applied Mathematics for Electronics Engineers)

The students will be able to:

| | |
|---|---|
| C101.1 | Apply the concepts of fuzzy sets, fuzzy logic, fuzzy prepositions and fuzzy quantifiers and in relate |
| C101.2 | Analyze the performance in terms of probabilities and distributions achieved by the determined solutions |
| C101.3 | Use some of the commonly encountered two dimensional random variables and extend to multivariate analysis. |
| C101.4 | Classify various random processes and solve problems involving stochastic processes. |
| C101.5 | Use queueing models to solve practical problems |

**Course Name: C102** (RESEARCH METHODOLOGY AND IPR)

The students will be able to:

| | |
|---|---|
| C102.1 | Formulate research problem |
| C102.2 | Carry out research analysis |
| C102.3 | Develop research proposal |
| C102.4 | Draft process of patenting |
| C102.5 | File and publish patents in R & D. |

**Course Name: C103** (ADVANCED DIGITAL SIGNAL PROCESSING)

The students will be able to:

| | |
|---|---|
| C103.1 | Describe the basics of Digital Signal Processing and Discrete Time Transforms. |
| C103.2 | Design and implement FIR/IIR digital filters using various structures |
| C103.3 | Estimate power spectrum using appropriate parametric/non-parametric method |
| C103.4 | Analyze discrete time system at different sampling frequencies using the concept of Multirate signal processing |
| C103.5 | Design discrete time system for the given application using Multi rate signal processing |

**Course Name: C104** (ADVANCED DIGITAL SYSTEM DESIGN)

The students will be able to:

| | |
|---|---|
| C104.1 | Analyse and design synchronous sequential circuits |
| C104.2 | Analyse hazards and design asynchronous sequential circuits |
| C104.3 | Knowledge on the testing procedure for combinational circuit and PLA |
| C104.4 | Able to design PLD and ROM. |
| C104.5 | Design and use programming tools for implementing digital circuits of industry standards |

**Course Name: C105** (SEMICONDUCTOR DEVICES AND MODELING)

The students will be able to:

| | |
|---|---|
| C105.1 | Explore the properties of MOS capacitors. |
| C105.2 | Analyze the various characteristics of MOSFET devices |
| C105.3 | Describe the various CMOS design parameters and their impact on performance of the device |
| C105.4 | Discuss the device level characteristics of BJT transistors. |
| C105.5 | Identify the suitable mathematical technique for simulation. |

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**Course Name: C106** (DIGITAL CMOS VLSI DESIGN)

The students will be able to:

| | |
|---|---|
| C106.1 | Use mathematical methods and circuit analysis models in analysis of CMOS digital circuits |
| C106.2 | Create models of moderately sized static CMOS combinational circuits that realize specified digital functions and to optimize combinational circuit delay using RC delay models and logical effort |
| C106.3 | Design sequential logic at the transistor level and compare the tradeoffs of sequencing elements including flip-flops, transparent latches |
| C106.4 | Understand design methodology of arithmetic building blocks |
| C106.5 | Design functional units including ROM and SRAM |

**Course Name: C107** (ELECTRONICS SYSTEM DESIGN LABORATORY)

The students will be able to:

| | |
|---|---|
| C107.1 | Design an instrumentation amplifier and voltage regulator |
| C107.2 | Design a PCB layout using CAD tool |
| C107.3 | Write a Verilog code for various combinational and sequential circuits |
| C107.4 | Develop a memory module with FPGA |
| C107.5 | Design an PLL circuit |

**Course Name: C108** (SIGNAL PROCESSING LABORATORY)

The students will be able to:

| | |
|---|---|
| C108.1 | Obtain the ability to apply knowledge of linear algebra, random process and multirate signal processing in various signal processing applications. |
| C108.2 | Develop the student's ability on conducting engineering experiments, analyze experimental observations scientifically |
| C108.3 | Become familiar to fundamental principles of linear algebra |
| C108.4 | Familiarize the basic operations of filter banks through simulations |
| C108.5 | Apply the principles of random process in practical applications |

**Course Name: C109** (ANALOG AND MIXED SIGNAL IC DESIGN)

The students will be able to:

| | |
|---|---|
| C109.1 | Carry out research and development in the area of analog and mixed signal IC design |
| C109.2 | Well versed with the MOS fundamentals, small signal models and analysis of MOSFET based circuits. |
| C109.3 | Analyse and model data converters architecture |
| C109.4 | Understand and Design different mixed signal circuits for various applications as per the user specifications. |
| C109.5 | Analyze and design mixed signal circuits such as Comparator, ADCs, DACs, PLL. |

**Course Name: C110** (INDUSTRIAL INTERNET OF THINGS)

The students will be able to:

| | |
|---|---|
| C110.1 | Understand the basic concepts and Architectures of Internet of Things. |
| C110.2 | Understand various IoT Layers and their relative importance. |
| C110.3 | Realize the importance of Data Analytics in IoT. |
| C110.4 | Study various IoT platforms and Security |

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| | |
|---|---|
| C110.5 | Understand the concepts of Design Thinking. |

**Course Name: C111** (POWER CONSERVATION CIRCUITS FOR ELECTRONICS)

The students will be able to:

| | |
|---|---|
| C111.1 | Describe the characteristics, operation of power switching devices and identify their ratings and applications. |
| C111.2 | Understand the requirements SCR Protection, Describe the Functioning of SCR their Construction and Performance. |
| C111.3 | Analyze and Design the Converter Based on SCR for various Industrial Applications |
| C111.4 | Demonstrate ability to understand High Frequency, Heating Systems, Timers, Relevant Sensors & Actuator and their Application in Industrial Setting. |
| C111.5 | Demonstrate the ability to understand and apply Data Communication, Telemetry & SCADA System in Industrial Applications. |

**Course Name: C112** (EMBEDDED SYSTEMS)

The students will be able to:

| | |
|---|---|
| C112.1 | Able to design an Embedded system |
| C112.2 | Understand a general and single purpose processor |
| C112.3 | Explain different protocols |
| C112.4 | Discuss state machine and design process models |
| C112.5 | Outline embedded software development tools and RTOS |

**Course Name: C113** (COMPUTER ARCHITECTURE AND PARALLEL PROCESSING)

The students will be able to:

| | |
|---|---|
| C113.1 | Understand the basic organization of computer and different instruction formats and addressing modes. |
| C113.2 | Interpret the representation and manipulation of data on the computer. |
| C113.3 | Illustrate about implementation schemes of control unit and pipeline performance. |
| C113.4 | Summarize the various types of parallelism architectures. |
| C113.5 | Compare the various memory hierarchy and I/O systems. |

**Course Name: C114** (VLSI DESIGN TECHNIQUES)

The students will be able to:

| | |
|---|---|
| C114.1 | Analyze the characteristics of CMOS transistor |
| C114.2 | Identify the methods to distribute clock and reduce power dissipation in CMOS circuits. |
| C114.3 | Design combinational and sequential circuits |
| C114.4 | Analyze the methods to test the CMOS circuits |
| C114.5 | Synthesize the combinational and sequential circuits using Verilog HDL |

**Course Name: C115** (VLSI DESIGN LABORATORY)

The students will be able to:

| | |
|---|---|
| C115.1 | Program in Verilog/VHDL for combinational and sequential circuits and implement the program in FPGA |
| C115.2 | Implement FIR and IIR filters in FPGA |
| C115.3 | Implement data path design and interfaces |
| C115.4 | Handle CAD tools to draw/edit, and analyze the CMOS circuits. |

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| | |
|---|---|
| C115.5 | Program and interface the Arduino Boards using Embedded C |

**Course Name: C116** (MINI PROJECT WITH SEMINAR)

The students will be able to:

| | |
|---|---|
| C116.1 | Search literature on various cutting-edge technologies and contemporary issues from various databases, books, journals, etc. |
| C116.2 | Compile the literature in a direction to reach a valid conclusion. |
| C116.3 | Analyze critically the assumptions, hypothesis and arguments of previous authors. |
| C116.4 | Describe the collection of evidence in order to draw conclusions consistent with the relevant text. |
| C116.5 | Communicate effectively the work done in a form of report. |

**Course Name: C201** (VLSI DESIGN TECHNIQUES)

The students will be able to:

| | |
|---|---|
| C201.1 | Analyze the characteristics of CMOS transistor |
| C201.2 | Identify the methods to distribute clock and reduce power dissipation in CMOS circuits. |
| C201.3 | Design combinational and sequential circuits |
| C201.4 | Analyze the methods to test the CMOS circuits |
| C201.5 | Synthesize the combinational and sequential circuits using Verilog HDL |

**Course Name: C202** (VLSI FOR WIRELESS COMMUNICATION)

The students will be able to:

| | |
|---|---|
| C202.1 | Able to recollect basic wireless communication concepts. |
| C202.2 | To understand the parameters in receiver and design a low noise amplifier |
| C202.3 | In a position to apply his knowledge on various types of mixers designed for wireless communication. |
| C202.4 | Design PLL and VCO |
| C202.5 | Understand the concepts of transmitters and utilize the power amplifiers in wireless communication. |

**Course Name: C203** (SENSORS AND ACTUATORS)

The students will be able to:

| | |
|---|---|
| C203.1 | Compare Actuators with various drive characteristics. |
| C203.2 | Evaluate digital sensors and semiconductor device sensors performance metrics. |
| C203.3 | Characterize the performance of Self-generating sensors. |
| C203.4 | Analyze the performance of self-generating Sensors. |
| C203.5 | Analyze the performance of resistive and reactive sensors. |

**Course Name: C204** (ENVIRONMENTAL IMPACT ASSESSMENT)

The students will be able to:

| | |
|---|---|
| C204.1 | Understand need for environmental clearance, its legal procedure, need of EIA, its types, stakeholders and their roles |
| C204.2 | Understand various impact identification methodologies, prediction techniques and model of impacts on various environments |
| C204.3 | Understand relationship between social impacts and change in community due to development activities and rehabilitation methods |

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| | |
|---|---|
| C204.4 | Document the EIA findings and prepare environmental management and monitoring plan |
| C204.5 | Identify, predict and assess impacts of similar projects based on case studies |

**Course Name: C205 (PROJECT PHASE 1)**

The students will be able to:

| | |
|---|---|
| C205.1 | Solve a specific problem right from its identification |
| C205.2 | Literature review till the successful solution of the problem |
| C205.3 | Train the students in preparing project reports and to face reviews and viva voce examination. |
| C205.4 | In a position to take up any challenging practical problems |
| C205.5 | Find solution by formulating proper methodology. |

**Course Name: C206 (PROJECT PHASE 1)**

The students will be able to:

| | |
|---|---|
| C206.1 | Solve a specific problem right from its identification |
| C206.2 | Literature review till the successful solution of the problem |
| C206.3 | Train the students in preparing project reports and to face reviews and viva voce examination. |
| C206.4 | In a position to take up any challenging practical problems |
| C206.5 | Find solution by formulating proper methodology. |

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## M.E COMPUTER SCIENCE AND ENGINEERING

### Anna University Regulation 2021

### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | MA4151 | Applied Probability and Statistics for Computer Science Engineers |
| 2. | C102 | RM4151 | Research Methodology and IPR |
| 3. | C103 | CP4151 | Advanced Data Structures and Algorithms |
| 4. | C104 | CP4152 | Database Practices |
| 5. | C105 | CP4153 | Network Technologies |
| 6. | C106 | CP4154 | Principles of Programming Languages |
| 7. | C107 | CP4161 | Advanced Data Structures and Algorithms Laboratory |
| 8. | C108 | CP4251 | Internet of Things |
| 9. | C109 | CP4253 | Multicore Architecture and Programming |
| 10. | C110 | CP4252 | Machine Learning |
| 11. | C111 | SE4151 | Advanced Software Engineering |
| 12. | C112 | MP4251 | Cloud Computing Technologies |
| 13. | C113 | CP4096 | Software Quality Assurance |
| 14. | C114 | CP4211 | Term Paper and seminar |
| 15. | C115 | CP4212 | Software Engineering Laboratory |
| 16. | C201 | CP4351 | Security Practices |
| 17. | C202 | CP4094 | Mobile and Pervasive Computing |
| 18. | C203 | IF4073 | Devops and Microservices |
| 19. | C204 | CX4016 | Environmental Sustainability |
| 20. | C205 | CP4311 | Project Work I |
| 21. | C206 | CP4411 | Project Work II |

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**Course name: C101 (Applied Probability and Statistics for Computer Science Engineers)**

The students will be able to:

| | |
|---|---|
| C101.1 | Apply the concepts of Linear Algebra to solve practical problems. |
| C101.2 | Use the ideas of probability and random variables in solving engineering problems. |
| C101.3 | Be familiar with some of the commonly encountered two dimensional random variables and be equipped for a possible extension to multivariate analysis. |
| C101.4 | Use statistical tests in testing hypotheses on data. |
| C101.5 | Develop critical thinking based on empirical evidence and the scientific approach to knowledge development. |

**Course name: C102 (Research Methodology and IPR)**

The students will be able to:

| | |
|---|---|
| C102.1 | Identify research problems. |
| C102.2 | Collect and prepare suitable data for research. |
| C102.3 | Design experiments for different statistical concepts. |
| C102.4 | Write research proposals and reports. |
| C102.5 | Apply their research work for patent through IPR |

**Course name: C103 (Advanced Data Structures and Algorithms)**

The students will be able to:

| | |
|---|---|
| C103.1 | Design data structures and algorithms to solve computing problems. |
| C103.2 | Choose and implement efficient data structures and apply them to solve problems. |
| C103.3 | Design algorithms using graph structure and various string-matching algorithms to solve real-life problems. |
| C103.4 | Design one's own algorithm for an unknown problem. |
| C103.5 | Apply suitable design strategy for problem solving. |

**Course name: C104 (Database Practices)**

The students will be able to:

| | |
|---|---|
| C104.1 | Convert the ER-model to relational tables, populate relational databases and formulate SQL queries on data. |
| C104.2 | Understand and write well-formed XML documents |
| C104.3 | Be able to apply methods and techniques for distributed query processing. |
| C104.4 | Design and Implement secure database systems. |
| C105.5 | Use the data control, definition, and manipulation languages of the NoSQL databases |

**Course name: C105 (Network Technologies)**

The students will be able to:

| | |
|---|---|
| C105.1 | Explain basic networking concepts |
| C105.2 | Compare different wireless networking protocols |
| C105.3 | Describe the developments in each generation of mobile data networks |
| C105.4 | Explain and develop SDN based applications |
| C105.5 | Explain the concepts of network function virtualization |

**Course name: C106 (Principles of Programming Languages)**

The students will be able to:

| | |
|---|---|
| C106.1 | Describe syntax and semantics of programming languages |

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| | |
|---|---|
| C106.2 | Explain data, data types, and basic statements of programming languages |
| C106.3 | Design and implement subprogram constructs |
| C106.4 | Apply object-oriented, concurrency, and event handling programming constructs |
| C106.5 | Develop programs in Scheme, ML, and Prolog |
| C106.6 | Understand and adopt new programming language |

**Course name: C107 (Advanced Data Structures and Algorithms Laboratory)**

The students will be able to:

| | |
|---|---|
| C107.1 | Design and implement basic and advanced data structures extensively |
| C107.2 | Design algorithms using graph structures |
| C107.3 | Design and develop efficient algorithms with minimum complexity using design techniques |
| C107.4 | Develop programs using various algorithms. |
| C107.5 | Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem. |

**Course name: C108 (Internet of Things)**

The students will be able to:

| | |
|---|---|
| C108.1 | Understand the various concept of the IoT and their technologies |
| C108.2 | Develop the IoT application using different hardware platforms |
| C108.3 | Implement the various IoT Protocols |
| C108.4 | Understand the basic principles of cloud computing |
| C108.5 | Develop and deploy the IoT application into cloud environment |

**Course name: C109 (Multicore Architecture and Programming)**

The students will be able to:

| | |
|---|---|
| C109.1 | Describe multicore architectures and identify their characteristics and challenges. |
| C109.2 | Identify the issues in programming Parallel Processors. |
| C109.3 | Write programs using OpenMP and MPI. |
| C109.4 | Design parallel programming solutions to common problems. |
| C109.5 | Compare and contrast programming for serial processors and programming for parallelprocessors. |

**Course name: C110 (Machine Learning)**

The students will be able to:

| | |
|---|---|
| C110.1 | Understand and outline problems for each type of machine learning |
| C110.2 | Design a Decision tree and Random forest for an application |
| C110.3 | Implement Probabilistic Discriminative and Generative algorithms for an application andanalyze the results. |
| C110.4 | Use a tool to implement typical Clustering algorithms for different types of applications. |
| C110.5 | Design and implement an HMM for a Sequence Model type of application and identify applications suitable for different types of Machine Learning with suitable justification |

**Course name: C111 (Advanced Software Engineering)**

The students will be able to:

| | |
|---|---|
| C111.1 | Identify appropriate process models based on the Project requirements |
| C111.2 | Understand the importance of having a good Software Architecture. |

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| | |
|---|---|
| C111.3 | Understand the five important dimensions of dependability, namely, availability, reliability,safety, security, and resilience. |
| C111.4 | Understand the basic notions of a web service, web service standards, and service-orientedarchitecture |
| C111.5 | Be familiar with various levels of Software testing |

**Course name: C112 (Cloud Computing Technologies)**

The students will be able to:

| | |
|---|---|
| C112.1 | Employ the concepts of virtualization in the cloud computing |
| C112.2 | Identify the architecture, infrastructure and delivery models of cloud computing |
| C112.3 | Develop the Cloud Application in AWS platform |
| C112.4 | Apply the concepts of Windows Azure to design Cloud Application |
| C112.5 | Develop services using various Cloud computing programming models. |

**Course name: C113 (Software Quality Assurance)**

The students will be able to:

| | |
|---|---|
| C113.1 | Utilize the concepts of SQA in software development life cycle |
| C113.2 | Demonstrate their capability to adopt quality standards. |
| C113.3 | Assess the quality of software products. |
| C113.5 | Apply the concepts in preparing the quality plan & documents. |
| C113.5 | Ensure whether the product meets company's quality standards and client's expectations and demands |

**Course name: C114 (Term Paper and seminar)**

The students will be able to:

| | |
|---|---|
| C114.1 | Develop scientific and technical reading skills |
| C114.2 | Develop scientific and technical writing skills |
| C114.3 | Develop the logical thinking ability |
| C114.4 | Understand and construct research articles. |
| C114.5 | Develop presentation skills |

**Course code: C115 (Software Engineering Laboratory)**

The students will be able to:

| | |
|---|---|
| C115.1 | Can produce the requirements and use cases the client wants for the software being produced. |
| C115.2 | Participate in drawing up the project plan. The plan will include at least extent and work assessments of the project, the schedule, available resources, and risk management can model and specify the requirements of mid-range software and their architecture. |
| C115.3 | Create and specify such a software design based on the requirement specification that the software can be implemented based on the design. |
| C115.4 | Assess the extent and costs of a project with the help of several different assessment methods. |

**Course Name: C201 (Security Practices)**

The Students will be able to

| | |
|---|---|
| C2O1.1 | Understand the core fundamentals of system security |
| C2O1.2 | Apply the security concepts to wired and wireless networks |
| C2O1.3 | Implement and Manage the security essentials in IT Sector |
| C2O1.4 | Explain the concepts of Cyber Security and Cyber forensics |
| C2O1.5 | Be aware of Privacy and Storage security Issues. |

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**Course Name: C202 (Mobile and Pervasive Computing)**

The Students will be able to

| | |
|---|---|
| C202.1 | Design a basic architecture for a pervasive computing environment |
| C202.2 | Design and allocate the resources on the 3G-4G wireless networks |
| C202.3 | Analyze the role of sensors in Wireless networks |
| C202.4 | Work out the routing in mesh network |
| C202.5 | Deploy the location and context information for application development |

**Course Name: C203 (Devops and Microservices)**

The Students will be able to

| | |
|---|---|
| C203.1 | Implement modern software Engineering process |
| C203.2 | work with DevOps platform |
| C203.3 | build, test and deploy code |
| C203.4 | Explore DevOps tools |
| C203.5 | Correlate MLOps concepts with real time examples |

**Course Name: C204 (Environmental Sustainability)**

The Students will be able to

| | |
|---|---|
| C204.1 | To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation. |
| C204.2 | To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society. |
| C204.3 | To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations. |
| C204.4 | To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development. |
| C204.5 | To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization |

**Course Name: C205 (Project Work I)**

The Students will be able to

| | |
|---|---|
| C205.1 | Apply relevant knowledge and skills to Identify challenging practical problems and a suitable approach to solve it.. |
| C205.2 | Analyze and discuss complex problems on the advanced level |
| C205.3 | Apply technical knowledge and project management skills for solving the problem. |
| C205.4 | Design and develop hardware and/or software for their project Specific problem. |
| C205.5 | Demonstrate the Partial work along with a project report and documentation |

**Course Name: C206 (Project Work II)**

The Students will be able to

| | |
|---|---|
| C206.1 | Apply relevant knowledge and skills to Identify challenging practical problems and a suitable approach to solve it.. |
| C206.2 | Analyze and discuss complex problems on the advanced level |
| C206.3 | Apply technical knowledge and project management skills for solving the problem. |
| C206.4 | Design and develop hardware and/or software for their project Specific problem. |
| C206.5 | Demonstrate the carried out work along with a project report and documentation |

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## M.E Structural Engineering

## Anna University Regulation 2021

### List of course names

| S.No | Course Code | Subject code | Course Name |
|---|---|---|---|
| 1. | C101 | MA4153 | Advanced Mathematical Methods |
| 2. | C102 | ST4101 | Theory of Elasticity and Plasticity |
| 3. | C103 | ST4102 | Structural Dynamics And Earthquake Engineering |
| 4. | C104 | RM4151 | Research Methodology and IPR |
| 5. | C105 | ST4004 | Prefabricated Structures |
| 6. | C106 | ST4161 | Advanced Construction Engineering and Experimental Techniques Laboratory |
| 7. | C107 | ST4111 | Technical Seminar |
| 8. | C108 | ST4201 | Advanced Steel Structures |
| 9. | C109 | ST4202 | Advanced Concrete Structures |
| 10. | C110 | ST4203 | Finite Element Analysis in Structural Engineering |
| 11. | C111 | CN4071 | Advanced Concrete Technology |
| 12. | C112 | ST4073 | Maintenance, Repair and Rehabilitation of Structures |
| 13. | C113 | ST4211 | Numerical and Finite Element Analysis Laboratory |
| 14. | C114 | ST4212 | Structural Design Studio |
| 15. | C201 | ST4010 | Design of Industrial Structures |
| 16. | C202 | ST4091 | Design of Bridge Structures |
| 17. | C203 | CX4016 | Environmental Sustainability |
| 18. | C204 | ST4311 | Practical Training |
| 19. | C205 | ST4312 | Project Work I |
| 20. | C206 | ST4411 | Project Work II |

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**Course name: C101(Advanced Mathematical Methods)**

The students will be able to:

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|---|---|
| C101.1 | Application of Laplace and Fourier transforms to the initial value, initial–boundary value and boundary value problems in Partial Differential Equations. |
| C101.2 | Maximizing and minimizing the functions that occur in various branches of Engineering Disciplines. |
| C101.3 | Construct conformal mappings between various domains and use conformal mapping in studying problems in physics and engineering, particularly fluid flow and heat flow problems. |
| C101.4 | Understand tensor algebra and its applications in applied sciences and engineering and develops the ability to solve mathematical problems involving tensors. |
| C101.5 | Competently use tensor analysis as a tool in the field of applied sciences and related fields. |

**Course name: C102 (Theory of Elasticity and Plasticity)**

The students will be able to:

| | |
|---|---|
| C102.1 | Derive and write the fundamental equations of elasticity describing the linear behavior of elements and develop constitutive models based on material behavior |
| C102.2 | Demonstrate the application of plane stress and plane strain in a given situation in both cartesian and polar coordinate systems |
| C102.3 | Solve torsion problems in circular and non-circular cross-sections |
| C102.4 | Analyse beams resting on elastic foundations |
| C102.5 | Solve analytically the simple boundary value problems with elasto-plastic and strain hardening properties |

**Course name: C103 (Structural Dynamics And Earthquake Engineering)**

The students will be able to:

| | |
|---|---|
| C103.1 | Do vibration analysis of system/structures with a single degree of freedom and can explain the method of damping the systems |
| C103.2 | Do the dynamic analysis of system/structures with Multi degrees of freedom under free and forced vibration |
| C103.3 | Derive a mathematical model of a continuous system and do a dynamic analysis under free and forced vibration |
| C103.4 | Explain the causes and effects of an earthquake |
| C103.5 | Design masonry and RC structures for the earthquake forces as per their commendations of IS codes of practice |

**Course name: C104 (Research Methodology and IPR)**

The students will be able to:

| | |
|---|---|
| C104.1 | Understand research problem formulation |
| C104.2 | Analyse Research related information and follow research ethics |
| C104.3 | Understand that today's world is controlled by computer , information technology but Tomorrow's world will be ruled by ideas, concepts and creativity |
| C104.4 | Understand that IPR would take such important place in growth of individuals and nation , it is needless to emphasize the need of information about Intellectual Property Right to be promoted among students in general and Engineering |
| C104.5 | Understand the concept, benefits, features and process E-filling of patent |

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**Course name: C105 (Prefabricated Structures)**

The students will be able to:

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|---|---|
| C105.1 | Explain the design principles involved in prefabrication |
| C105.2 | Detail the different types of connection |
| C105.3 | Design for stripping forces during manufacture |
| C105.4 | Determine the forces in shear walls |
| C105.5 | Identify the different roof trusses used in industrial buildings |

**Course name: C106 (Advanced Construction Engineering and Experimental Techniques Laboratory)**

The students will be able to:

| | |
|---|---|
| C106.1 | Do the mix proportion using IS and ACI codal provisions. |
| C106.2 | Test the concrete in a non-destructive manner using rebound hammer. |
| C106.3 | Know the permeability characteristics of concrete. |
| C106.4 | Observe the effect of mineral and chemical admixture in concrete. |
| C106.5 | Study the flow characteristics of self-compacting concrete |

**Course name: C107 (Technical Seminar)**

The students will be able to:

| | |
|---|---|
| C107.1 | Identify the latest developments in the field of Structural Engineering |
| C107.2 | Acquire technical writing abilities for seminars, conferences and journal publications |
| C107.3 | Use modern tools to present the technical details |
| C107.4 | Conduct brainstorming sessions on technical concepts |
| C107.5 | Gain insight on upcoming trends in Structural Engineering |

**Course name: C108 (Advanced Steel Structures)**

The students will be able to:

| | |
|---|---|
| C108.1 | Design the steel members such as purlins, gable wind girders subjected to combinedforces |
| C108.2 | Explain and design different types of steel connections such as welded and bolted flexibleas well as moment resisting connections |
| C108.3 | Analyze and design industrial structures such as trusses and portal frames subjected towind and seismic forces |
| C108.4 | Explain the effect of axial force and shear force on steel structures and analyse continuousbeams and frames using plastic theory |
| C108.5 | Evaluate the behaviour and design of compression and flexural Cold-formed Steelmembers |

**Course name: C109 (Advanced Concrete Structures)**

The students will be able to:

| | |
|---|---|
| C109.1 | Explain the structural behaviour of flexural members and columns |
| C109.2 | Design the compression members and construct interaction diagrams |
| C109.3 | Design the special elements like corbels, deep beams and grid floors |
| C109.4 | Design flat slab and spandrel beams |
| C109.5 | Predict the moment curvature behavior and design and detail concrete elementsbased on ductility |

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**Course name: C110 (Finite Element Analysis in Structural Engineering)**

The students will be able to:

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|---|---|
| C110.1 | Formulate a finite element problem using basic mathematical principles |
| C110.2 | Explain the various types of elements and select the appropriate element for modelling |
| C110.3 | Analyse a frame using truss element |
| C110.4 | Formulate and analyse the two- and three-dimensional solid finite element problems |
| C110.5 | Analyse shells, thick and thin plates and explain the dynamic analysis using FEM |

**Course name: C111 (Advanced Concrete Technology)**

The students will be able to:

| | |
|---|---|
| C111.1 | Develop knowledge on various materials needed for concrete manufacture |
| C111.2 | Apply the rules to do mix designs for concrete by various methods |
| C111.3 | Develop the methods of manufacturing of concrete. |
| C111.4 | Explain about various special concrete |
| C111.5 | Explain various tests on fresh and hardened concrete |

**Course name: C112 (Maintenance, Repair and Rehabilitation of Structures)**

The students will be able to:

| | |
|---|---|
| C112.1 | Explain the importance of maintenance assessment and repair strategies |
| C112.2 | Acquire knowledge of strength and durability properties and their effects due toclimate and temperature. |
| C112.3 | Gain knowledge of recent developments in repair |
| C112.4 | Explain the techniques for repair and protection methods |
| C112.5 | Explain the repair, rehabilitation and retrofitting of structures and demolition methods. |

**Course name: C113 (Numerical and Finite Element Analysis Laboratory)**

The students will be able to:

| | |
|---|---|
| C113.1 | Thorough knowledge to handle FE software |
| C113.2 | Dynamic analysis of frames |
| C113.3 | Analysis of thin and thick plates |
| C113.4 | Stability Analysis |
| C113.5 | Learn to use MATLAB and import MATLAB codes for FEmodelling |

**Course name: C114 (Structural Design Studio)**

The students will be able to:

| | |
|---|---|
| C114.1 | Understand the requirements of a structure and model it accordingly using computer software |
| C114.2 | Analyze the structure for various loads and load combinations according to the relevant IS codes |
| C114.3 | Design and detail structures using computer software/tools and check the correctness using manual approximate methods |
| C114.4 | Prepare the complete structural drawings using computer software |
| C114.5 | Observe the flow of forces in a structure and its response to it. |

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**Course Name: C201 (Design of Industrial Structures)**

The students will be able to:

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|---|---|
| C201.1 | Develop the concept of planning & functional requirements of industrial standards. |
| C201.2 | Analyse and design Steel Gantry girders & Crane girders and RCC design of corbels, nibs and staircase. |
| C201.3 | Analyse & design cooling towers, bunkers, silos and pipe supporting structures. |
| C201.4 | Analyse and design Steel transmission line towers and chimneys. |
| C201.5 | Design foundations for cooling tower, chimneys and turbo generator. |

**Course Name: C202 (Design of Bridge Structures)**

The students will be able to:

| | |
|---|---|
| C202.1 | Explain the different types of bridges and design philosophies |
| C202.2 | Design an RC solid slab culvert bridge |
| C202.3 | Design an RC Tee Beam and Slab bridge |
| C202.4 | Design the bridge bearings and substructure |
| C202.5 | Explain the design principles of PSC bridges, box girder bridges, truss bridges |

**Course Name: C203 (Environmental Sustainability)**

The students will be able to:

| | |
|---|---|
| C203.1 | Understand the Concepts, Valuing the Environment and Environmental Problems |
| C203.2 | Understand the Concepts of sustainability |
| C203.3 | Explain the significance of biodiversity |
| C203.4 | Acquire knowledge of pollution impacts |
| C203.5 | Acquire knowledge of environmental economics |

**Course Name: C204 (Practical Training)**

The students will be able to:

| | |
|---|---|
| C204.1 | Describe the Structural Engineering organization |
| C204.2 | Realize the various functions of construction activities |
| C204.3 | Gain an understanding of groups and group dynamics |
| C204.4 | Participate in real-life construction projects |
| C204.5 | Put to use the theoretical knowledge gained so far |

**Course Name: C205 (Project Work I)**

The students will be able to:

| | |
|---|---|
| C205.1 | Apply the knowledge gained from theoretical and practical courses in solving problems |
| C205.2 | Recognize the importance of literature review |
| C205.3 | Develop a clear outline and methodology for the project |
| C205.4 | Identify the potential research gap and list parameters to work with |
| C205.5 | Report and present the findings of the work conducted. |

**Course Name: C206 (Project Work II)**

The students will be able to:

| | |
|---|---|
| C206.1 | Discover potential research areas in the field of Structural Engineering. |
| C206.2 | Apply the knowledge gained from theoretical and practical courses to be creative, well-planned, organized and coordinated |
| C206.3 | Represent data acquired in graphical and reader-friendly formats |

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| | |
|---|---|
| C206.4 | Derive detailed conclusions from work carried out |
| C206.5 | Report and present the findings of the work conducted |

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