



SSM INSTITUTE OF ENGINEERING ANTECHNOLOGY

(Approved by AICTE, New Delhi / Affiliated to Anna University, Chennai / Accredited by NAAC)

(Accredited by NBA – ECE, EEE & MECH UG Programs)

Dindigul – Palani Highway, Dindigul 624 002

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Anna University Regulations 2017

First Year Courses (I & II Semester)

Course Outcomes (COs)

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|-------------|---------------|------------------------------|
| C101 | HS8151 | Communicative English |
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Course Outcomes (Cos)

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| C101.1 | Read articles of a general kind in magazines and newspapers. |
| C101.2 | Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English |
| C101.3 | Comprehend conversations and short talks delivered in English |
| C101.4 | Listen to dialogues and conversations and to complete exercises based on them. |
| C101.5 | Write short essays of a general kind and personal letters and emails in English. |

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| C102 | MA8151 | Engineering Mathematics – I |
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Course Outcomes (Cos)

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| C102.1 | Use both the limit definition and rules of differentiation to differentiate functions and Apply differentiation to solve maxima and minima problems. |
| C102.2 | Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus |
| C102.3 | Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts and Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. |
| C102.4 | Determine convergence/divergence of improper integrals and evaluate convergent improper integrals |
| C102.5 | Apply various techniques in solving differential equations parts. |

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| | | |
|-------------|---------------|----------------------------|
| C103 | PH8151 | Engineering Physics |
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Course Outcomes (Cos)

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|--------|--|
| C103.1 | The students will gain knowledge on the basics of properties of matter and its applications. |
| C103.2 | The students will acquire knowledge on the concepts of waves and optical devices and their applications in fiber optics, |
| C103.3 | The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers. |
| C103.4 | The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, |
| C103.5 | The students will understand the basics of crystals, their structures and different crystal growth techniques. |

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| C104 | CY8151 | Engineering Chemistry |
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Course Outcomes (Cos)

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| C104.1 | The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning. |
| C104.2 | To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys. |
| C104.3 | To know the Preparation, properties and applications of engineering materials. |
| C104.4 | To know the types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels. |
| C104.5 | To apply the Principles and generation of energy in batteries, nuclear reactors, solar cells, windmills and fuel cells. |

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| | | |
|-------------|---------------|---|
| C105 | GE8151 | Problem Solving and Python Programming |
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Course Outcomes (Cos)

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|--------|---|
| C105.1 | Develop algorithmic solutions to simple computational problems |
| C105.2 | Read, write, execute and structure by hand simple Python programs. |
| C105.3 | 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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| C106 | GE8152 | Engineering Graphics |
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Course Outcomes (Cos)

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|--------|--|
| 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. |

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| C107 | GE8161 | Problem Solving and Python Programming Laboratory |
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Course Outcomes (Cos)

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| C107.1 | Write, test, and debug simple Python programs. |
| C107.2 | Implement Python programs with conditionals and loops. |
| C107.3 | Develop Python programs stepwise 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. |

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| | | |
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| C108 | BS8161 | Physics and Chemistry Laboratory |
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Course Outcomes (Cos)

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| C108.1 | Apply principles of elasticity, optics and thermal properties for engineering applications. |
| C108.2 | The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters. |

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| C109 | HS8251 | Technical English |
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Course Outcomes (Cos)

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|---------------|--|
| C109.1 | Read technical texts and write area- specific texts effortlessly. |
| C109.2 | Listen and comprehend lectures and talks in their area of specialization successfully. |
| C109.3 | Speak appropriately and effectively in varied formal and informal contexts. |
| C109.4 | Write reports and winning job applications. |
| C109.5 | Participate effectively in public speaking and group discussion |

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| C110 | MA8251 | Engineering Mathematics – II |
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Course Outcomes (Cos)

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| C110.1 | Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. |
| C110.2 | Gradient, divergence and curl of a vector point function and related identities. |
| C110.3 | Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. |
| C110.4 | Analytic functions, conformal mapping and complex integration. |
| C110.5 | Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients. |

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| C111 | PH8253 | PHYSICS FOR ELECTRONICS ENGINEERING |
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Course Outcomes (Cos)

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| C111.1 | Gain knowledge on classical and quantum electron theories, and energy band structures, |
| C111.2 | Acquire knowledge on basics of semiconductor physics and its applications in various devices, |
| C111.3 | Get knowledge on magnetic properties of materials and their applications in data storage, |
| C111.4 | Have the necessary understanding on the functioning of optical materials for optoelectronics, |
| C111.5 | Understand the basics of quantum structures and their applications in carbon electronics. |

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| C112 | BE8254 | BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING |
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Course Outcomes (Cos)

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| C112.1 | Understand the concept of three phase power circuits and measurement |
| C112.2 | Comprehend the concepts in electrical generators, motors and transformers |
| C112.3 | Choose appropriate measuring instruments for given application |

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| | | |
|-------------|---------------|-------------------------|
| C113 | EC8251 | CIRCUIT ANALYSIS |
|-------------|---------------|-------------------------|

Course Outcomes (Cos)

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|---------------|--|
| C113.1 | Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time |
| C113.2 | Design and understand and evaluate the AC and DC circuits |

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| C114 | EC8252 | ELECTRONIC DEVICES |
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Course Outcomes (Cos)

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|---------------|---|
| C114.1 | Explain the V-I characteristic of diode, UJT and SCR |
| C114.2 | Describe the equivalence circuits of transistors |
| C114.3 | Operate the basic electronic devices such as PN junction diode, Bipolar and Field effect Transistors, Power control devices, LED, LCD and other Opto-electronic devices |

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| | | |
|-------------|---------------|--|
| C115 | EC8261 | CIRCUITS AND DEVICES LABORATORY |
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Course Outcomes (Cos)

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

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| C116 | GE8261 | ENGINEERING PRACTICES LABORATORY |
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Course Outcomes (Cos)

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| C116.1 | Students will be able to fabricate welding equipment's to join the structures and also carpentry components and pipe connections including plumbing works. |
| C116.2 | Students will be able to carry out the basic machining operations and able to make the models using sheet metal works |
| C116.3 | Students will be able to illustrate centrifugal pump, air conditioner, operations of smithy, foundry and fittings. |
| C116.4 | Students will be able to carry out basic home electrical works and appliances and able to measure the electrical quantities. |
| C116.5 | Students will be able to elaborate on the components, gates, soldering practices. |

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Anna University Regulations 2017

Second Year Courses (III & IV Semester)

Course Outcomes (COs)

| | | |
|------|--------|---|
| C201 | MA8352 | Linear Algebra and Partial Differential Equations |
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Course Outcomes (Cos)

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|--------|---|
| C201.1 | Explain the fundamental concepts of advanced algebra and their role in modern 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 | Able to solve various types of partial differential equations |
| C201.5 | Able to solve engineering problems using Fourier series. |

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| C202 | EC8393 | Fundamentals of Data Structures In C |
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Course Outcomes (Cos)

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| C202.1 | Explain the fundamental concept of C programming and operations performing in it. |
| C202.2 | Demonstrate the concept of data structures, storage structures and common operations on them |
| C202.3 | Distinguish the various linear and non linear data structures with their representation and perform different operations on them |
| C202.4 | Apply the various data operations using Tree and graph structures |
| C202.5 | Appropriately choose the sorting and searching algorithm for an application |

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|-------------|---------------|-------------------------------|
| C203 | EC8351 | Electronic Circuits- I |
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Course Outcomes (Cos)

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|---------------|--|
| C203.1 | Understand various biasing methods and stabilization techniques of different transistors |
| C203.2 | Analyze the performance of small signal single stage and multi stage BJT amplifiers |
| C203.3 | Analyze the performance of small signal single stage and multi stage FET amplifiers |
| C203.4 | Acquire knowledge of Frequency response characteristics of BJT and FET amplifiers |
| C203.5 | Apply the knowledge of electronic circuits to design power supply |

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| C204 | EC8352 | Signals and Systems |
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Course Outcomes (Cos)

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|---------------|--|
| C204.1 | Classify the Signals and Systems according to its properties |
| C204.2 | Apply Laplace Transform, Fourier transform, Z- Transform and DTFT in signal analysis |
| C204.3 | Examine continuous time LTI systems using Fourier and Laplace transforms |
| C204.4 | Make use of Z transform and DTFT in discrete time signals |
| C204.5 | Interpret the LTI discrete time systems using Z transform and DTFT |

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| C205 | EC8392 | Digital Electronics |
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Course Outcomes (Cos)

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|---------------|--|
| C205.1 | Minimize Boolean expressions in different forms and implement them using logic gates |
| C205.2 | Design various combinational digital circuits using logic gates |
| C205.3 | Analysis of synchronous sequential circuits and its internal structures |
| C205.4 | Design asynchronous sequential circuits for a given specification |
| C205.5 | Discuss about the characteristics and structure of different memory systems |

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| | | |
|-------------|---------------|------------------------------------|
| C206 | EC8391 | Control Systems Engineering |
|-------------|---------------|------------------------------------|

Course Outcomes (Cos)

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

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| C207 | EC8381 | Fundamentals of Data Structures in C Laboratory |
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Course Outcomes (Cos)

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| 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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| C208 | EC8361 | Analog and Digital Circuits Laboratory |
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Course Outcomes (Cos)

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| C208.1 | Demonstrate the frequency response of the various types of amplifiers and implementation of digital logic circuits |
| C208.2 | Analyze the limitations and performance in bandwidth of single stage and multi stage amplifiers |
| C208.3 | Design a lumped circuit in bread board and in simulation tool to determine the bandwidth of an amplifiers and digital logic circuits to verify the truth table. |
| C208.4 | Summarize a report from the output obtained for analog as well as digital circuits |

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|-------------|---------------|--|
| C209 | HS8381 | Interpersonal Skills / Listening & Speaking |
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Course Outcomes (Cos)

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|---------------|---|
| 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 |

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|-------------|---------------|---|
| C210 | MA8451 | Probability and Random Processes |
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Course Outcomes (Cos)

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| 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 applying 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 | The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems |

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| C211 | EC8452 | Electronic Circuits II |
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Course Outcomes (Cos)

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| C211.1 | Analyze the different types of Feedback Amplifier Circuits |
| C211.2 | Design the different types of Oscillators for given specifications |
| C211.3 | Examine the performance of various tuned amplifiers |
| C211.4 | Design the different types of Wave Shaping and Multivibrators |
| C211.5 | Summarize the operation of Power Amplifiers and DC converters |

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|-------------|---------------|-----------------------------|
| C212 | EC8491 | Communication Theory |
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Course Outcomes (Cos)

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|---------------|--|
| C212.1 | Understand the fundamentals of Amplitude modulation schemes. |
| C212.2 | Summarize the concepts of Angle modulation schemes and compare AM and FM . |
| C212.3 | Apply the concepts of random process in the design of Communication systems. |
| C212.4 | Analyze the noise performance of AM and FM systems. |
| C212.5 | Gain knowledge in sampling ,quantization and pulse modulation schemes |

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| C213 | EC8451 | Electromagnetic Fields |
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Course Outcomes (Cos)

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| C213.1 | Understanding of fundamental electromagnetic laws and concepts mathematically. |
| C213.2 | Estimation of electric field quantity based on concepts and laws |
| C213.3 | Estimation of magnetic field quantity based on concepts and laws |
| C213.4 | Explain the concept of time varying fields and write Maxwell's equations in all forms |
| C213.5 | Analyze propagation of plane wave in different media's and boundaries. |

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| C214 | EC8453 | Linear Integrated Circuits |
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Course Outcomes (Cos)

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| C214.1 | Illustrate the concept of linear integrated circuits |
| C214.2 | Design the linear and non linear applications of OP-AMP. |
| C214.3 | Design applications using analog multiplier and PLL |
| C214.4 | Design ADC and DAC using OP – AMPS |
| C214.5 | Generate waveforms using OP – AMP Circuits and Analyze special function ICs |

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|-------------|---------------|--|
| C215 | GE8291 | Environmental Science and Engineering |
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Course Outcomes (Cos)

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|---------------|--|
| C215.1 | Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course. |
| C215.2 | Environmental Pollution or problems cannot be solved by mere laws |
| C215.3 | Public awareness of environmental is at infant stage. |
| C215.4 | Ignorance and incomplete knowledge has lead to misconceptions |
| C215.5 | Development and improvement in std. of living has lead to serious environmental disasters. |

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| C216 | EC8461 | Circuits Design and Simulation Laboratory |
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Course Outcomes (Cos)

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|---------------|--|
| C216.1 | Understand the various types of amplifiers, oscillators and multivibrators |
| C216.2 | Design applications to test Nested and Join Queries |
| C216.3 | Demonstrate the knowledge in design schemes through implementation of oscillators and tuned amplifiers |

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| C217 | EC8462 | Linear Integrated Circuits Laboratory |
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Course Outcomes (Cos)

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| C217.1 | Design amplifiers, oscillators, D-A converters using operational amplifiers |
| C217.2 | Design filters using op-amp and performs an experiment on frequency response. |
| C217.3 | Analyze the working of PLL and describe its application as a frequency multiplier. |
| C217.4 | Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE |

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Anna University Regulations 2017

Third Year Courses (V & VI Semester)

Course Outcomes (COs)

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|-------------|---------------|------------------------------|
| C301 | EC8501 | Digital Communication |
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Course Outcomes (Cos)

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| C301.1 | Apply the concepts of source coding techniques on the information signals. |
| C301.2 | Compare the various waveform coding schemes. |
| C301.3 | Understand the various baseband transmission scheme |
| C301.4 | Analyze characteristics of different digital modulation schemes and their noise performance. |
| C301.5 | Apply various error control coding schemes over information bits. |

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| C302 | EC8553 | Discrete-Time Signal Processing |
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Course Outcomes (Cos)

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| C302.1 | Apply DFT for the analysis of signals and systems |
| C302.2 | Understand and design IIR filters. |
| C302.3 | Understand and design FIR filters. |
| C302.4 | Characterize the effects of finite precision representation on digital filters |
| C302.5 | Understand the DSP architectures and its applications |

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| C303 | EC8552 | Computer Architecture and Organization |
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Course Outcomes (Cos)

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| C303.1 | Describe data representation, instruction formats and the operation of a digital computer |
| C303.2 | Illustrate the fixed point and floating-point arithmetic for ALU operation |
| C303.3 | Discuss about implementation schemes of control unit and pipeline performance |
| C303.4 | Explain the concept of various memories, interfacing and organization of multiple processors |
| C303.5 | Discuss parallel processing technique and unconventional architectures |

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|-------------|---------------|-------------------------------|
| C304 | EC8551 | Communication Networks |
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Course Outcomes (Cos)

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|---------------|--|
| C304.1 | Summarize the components required to build different types of networks. |
| C304.2 | Outline the required functionality of Data link and Media access control. |
| C304.3 | Identify the solution for various functionalities at routing protocols. |
| C304.4 | Identify the flow of information from one node to another node in the Transport layer. |
| C304.5 | Explain the various functionality at application layer |

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| C306 | EC8073 | Medical Electronics |
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Course Outcomes (Cos)

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| C306.1 | Know the human body electro-physiological parameters and recording of bio- potentials |
| C306.2 | Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc |
| C306.3 | Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators. |
| C306.4 | Understand physical medicine methods eg. ultrasonic, shortwave, microwave, Surgical diathermies , and bio-telemetry principles and methods |
| C306.5 | Know about recent trends in medical instrumentation |

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| C313 | OMD551 | Biomedical instrumentation |
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Course Outcomes (Cos)

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| C313.1 | Learn the different bio potentials with propagation and various types of electrodes |
| C313.2 | Compute the different electrode placement for various physiological recording |
| C313.3 | Illustrate the different types of bio-amplifiers |
| C313.4 | Know techniques for non electrical physiological measurements |
| C313.5 | Understand the different biochemical measurements |

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|-------------|---------------|---|
| C337 | EC8562 | Digital Signal Processing Laboratory |
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Course Outcomes (Cos)

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|---------------|---|
| C337.1 | Carryout basic signal processing operations |
| C337.2 | Demonstrate their abilities towards MATLAB based implementation of various DSP systems |
| C337.3 | Analyze the architecture of a DSP Processor AND Design a DSP system for various applications of DSP |
| C337.4 | Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals |

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| C338 | EC8561 | Communication Systems Laboratory |
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Course Outcomes (Cos)

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| C338.1 | Simulate & validate the various functional modules of a communication system |
| C338.2 | Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes |
| C338.3 | Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system |
| C338.4 | Simulate end-to-end communication Link |

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| C339 | EC8563 | Communication Networks Laboratory |
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Course Outcomes (Cos)

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| C339.1 | Students develop the ability to implementing various routing protocols and maintaining a secure data transfer. Identifying the procedure of doing the experiment. |
| C339.2 | Students develop the ability to examine various routing protocols |
| C339.3 | Students have the ability to design and simulate various types of topologies and understanding the differences between them. |
| C339.4 | Students able to Illustrate the different aspects of networks, protocols and network design models. |

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| | | |
|-------------|---------------|---|
| C340 | EC8691 | Microprocessors and Microcontrollers |
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Course Outcomes (Cos)

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|---------------|--|
| C340.1 | Outline basics of 8086 and execute programs based on 8086 microprocessor |
| C340.2 | Discuss the 8086 memory interfacing circuits |
| C340.3 | Illustrate the 8086 based I/O Interfacings circuits |
| C340.4 | Describe the basics of 8051 and execute programs based on 8051 microcontroller |
| C340.5 | Construct a system based on 8051 microcontroller |

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|-------------|---------------|--------------------|
| C341 | EC8095 | VLSI Design |
|-------------|---------------|--------------------|

Course Outcomes (Cos)

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|---------------|--|
| C341.1 | Explain the various characteristics of CMOS transistor and sketch layout diagram for Boolean expressions |
| C341.2 | Construct digital combinational circuits based on various MOS technologies and explain various |
| C341.3 | Explain the various sequential logic circuits for digital operations |
| C341.4 | Illustrate various arithmetic building blocks and memory subsystems |
| C341.5 | Understand the various implementation strategies of the combinational and sequential logic circuits |

| | | |
|-------------|---------------|-------------------------------|
| C342 | EC8652 | Wireless Communication |
|-------------|---------------|-------------------------------|

Course Outcomes (Cos)

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|---------------|---|
| C342.1 | Characterize a wireless channel and evolve the system design specifications |
| C342.2 | Design a cellular system based on resource availability and traffic demands |
| C342.3 | Identify the various signaling schemes for fading channels |
| C342.4 | Identify suitable multipath mitigation techniques for the wireless channel and system under consideration |
| C342.5 | Understand the concepts of multiple antenna techniques |

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| | | |
|-------------|---------------|---------------------------------|
| C343 | MG8591 | Principles of Management |
|-------------|---------------|---------------------------------|

Course Outcomes (Cos)

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|---------------|--|
| C343.1 | Evolution of management, functions and roles of managers |
| C343.2 | Different types of planning process and tools used for planning |
| C343.3 | Different organization structures and functions of human resources manager |
| C343.4 | control techniques and the role of technology in management |
| C343.5 | Control techniques and the role of technology in management |

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|-------------|---------------|--|
| C344 | EC8651 | Transmission Lines and RF Systems |
|-------------|---------------|--|

Course Outcomes (Cos)

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|---------------|--|
| C344.1 | Explain the characteristics of transmission lines and its losses |
| C344.2 | Write about the standing wave ratio and input impedance in high frequency transmission lines |
| C344.3 | Analyze impedance matching by stubs using smith charts |
| C344.4 | Analyze the characteristics of TE and TM waves |
| C344.5 | Design a RF transceiver system for wireless communication |

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|-------------|---------------|--------------------------|
| C350 | EC8004 | Wireless Networks |
|-------------|---------------|--------------------------|

Course Outcomes (Cos)

| | |
|---------------|--|
| C350.1 | Explain the various protocols and standards of wireless LAN. |
| C350.2 | Describe the concept of Mobile IP packet delivery and routing in mobile ad-hoc network |
| C350.3 | Analyze the fundamentals of 3G services and its Protocol |
| C350.4 | Discuss about the different wireless WAN architectures. |
| C350.5 | Explain 4G technologies and its applications |

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| | | |
|-------------|---------------|--|
| C352 | EC8681 | MICROPROCESSOR AND MICROCONTROLLER LABORATORY |
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Course Outcomes (Cos)

| | |
|---------------|--|
| C352.1 | Ability to Write ALP Programmes for fixed and Floating Point and Arithmetic operations |
| C352.2 | Ability to Interface different I/Os with processor |
| C352.3 | Ability to Generate waveforms using Microprocessors |
| C352.4 | Ability to Execute Programs in 8051 |
| C352.5 | Ability to Write ALP Programmes for fixed and Floating Point and Arithmetic operations |

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|-------------|---------------|-------------------------------|
| C353 | EC8661 | VLSI Design Laboratory |
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Course Outcomes (Cos)

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|---------------|--|
| C353.1 | Write HDL code for basic as well as advanced digital integrated circuit |
| C353.2 | Import the logic modules into FPGA Boards |
| C353.3 | Synthesize Place and Route the digital IPs |
| C353.4 | Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools |

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|-------------|---------------|--------------------------|
| C354 | EC8611 | Technical Seminar |
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Course Outcomes (Cos)

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|---------------|---|
| C354.1 | Establish motivation for any topic of interest and develop a thought process for technical presentation |
| C354.2 | Organize a detailed literature survey and build a document with respect to technical publications |
| C354.3 | Analysis and comprehension of proof-of-concept and related data |
| C354.4 | Effective presentation and improve soft skills |
| C354.5 | Make use of new and recent technology for creating technical reports |

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| | | |
|-------------|---------------|-----------------------------------|
| C355 | HS8581 | Professional Communication |
|-------------|---------------|-----------------------------------|

Course Outcomes (Cos)

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|---------------|---|
| C355.1 | Make effective presentations |
| C355.2 | Participate confidently in Group Discussions |
| C355.3 | Attend job interviews and be successful in them. |
| C355.4 | Develop adequate Soft skills required for the workplace |

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Anna University Regulations 2017

Final Year Courses (VII & VIII Semester)

Course Outcomes (COs)

| | | |
|-------------|---------------|---|
| C401 | EC8701 | Antennas and Microwave Engineering |
|-------------|---------------|---|

Course Outcomes (Cos)

| | |
|---------------|---|
| C401.1 | Apply the basic principles and evaluate antenna parameters and link power budgets |
| C401.2 | Design and Analyze the performance of Wire, Microstrip and frequency independent antennas |
| C401.3 | Analyze array antenna with its applications |
| C401.4 | Understand the operation of various microwave devices |
| C401.5 | Design a microwave system given the application specifications |

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|-------------|---------------|------------------------------|
| C402 | EC8751 | Optical Communication |
|-------------|---------------|------------------------------|

Course Outcomes (Cos)

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|---------------|--|
| 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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| | | |
|-------------|---------------|---------------------------------------|
| C403 | EC8791 | Embedded and Real Time Systems |
|-------------|---------------|---------------------------------------|

Course Outcomes (Cos)

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|---------------|--|
| C403.1 | Discuss the basic concepts of embedded system |
| C403.2 | Describe the architecture and peripherals of ARM processor |
| C403.3 | Discuss about the embedded program strategies and optimization |
| C403.4 | Explain the basic concepts of real time operating system design |
| C403.5 | Illustrate the model real-time applications using embedded-system concepts |

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|-------------|---------------|--|
| C404 | EC8702 | Ad hoc and Wireless Sensor Networks |
|-------------|---------------|--|

Course Outcomes (Cos)

| | |
|---------------|---|
| C404.1 | Know 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 | Be familiar with the OS used in Wireless Sensor Networks and build basic modules |

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|-------------|---------------|--|
| C405 | EC8092 | Advanced Wireless communication |
|-------------|---------------|--|

Course Outcomes (Cos)

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|---------------|---|
| C405.1 | Understanding the importance of improving capacity of wireless channel using MIMO |
| C405.2 | Explain the characteristics of small scale and large scale fading measurements. |
| C405.3 | Identify the significance of channel impairment mitigation using space-time block codes. |
| C405.4 | Identify the channel impairment mitigation using Trellis codes |
| C405.5 | Outline the concept of advanced MIMO system like layered space time codes, MU-MIMO System and MIMO-OFDM systems |

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| | | |
|-------------|---------------|-------------------------------------|
| C425 | OBT753 | Introduction to cell biology |
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Course Outcomes (Cos)

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|---------------|---|
| C425.1 | Understand the basics concepts of cell structure |
| C425.2 | Understand the various types of cell organelles and its functions |
| C425.3 | Classify the types of cell divisions |
| C425.4 | Explain and compare the architectural hierarchy of DNA, RNA and Protein |
| C425.5 | Illustrate the role of enzymes in industries. |

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|-------------|---------------|----------------------------|
| C438 | EC8711 | Embedded Laboratory |
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Course Outcomes (Cos)

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|---------------|--|
| C438.1 | Write programs in ARM for a specific Application |
| C438.2 | Interface memory, A/D and D/A convertors with ARM system |
| C438.3 | Analyze the performance of interrupt |
| C438.4 | Write program for interfacing keyboard, display, motor and sensor. |

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|-------------|---------------|--|
| C439 | EC8761 | Advanced Communication Laboratory |
|-------------|---------------|--|

Course Outcomes (Cos)

| | |
|---------------|---|
| C439.1 | Analyze the performance of simple optical link by measurement of losses and analyzing the mode characteristics of fiber |
| C439.2 | Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER |
| C439.3 | Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System |
| C439.4 | Understand the intricacies in Microwave System design |

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| | | |
|-------------|---------------|---------------------------------|
| C444 | EC8093 | Digital Image Processing |
|-------------|---------------|---------------------------------|

Course Outcomes (Cos)

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|---------------|---|
| C444.1 | Explain the fundamentals of digital image processing techniques. |
| C444.2 | Explain the various image enhancement techniques in spatial and frequency domain. |
| C444.3 | Apply the various filtering methods for image restoration. |
| C444.4 | Operate on images using the various techniques for image segmentation. |
| C444.5 | Use various techniques for image compression and recognition. |

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|-------------|---------------|---|
| C445 | GE8076 | Professional Ethics in Engineering |
|-------------|---------------|---|

Course Outcomes (Cos)

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|---------------|--|
| C445.1 | To understand the core values that shapes the ethical behavior of an engineer and awareness of professional ethics, safety and global issues. |
| C445.2 | To apply the ethical principles and examine the perception of professional ethics, various moral issues and uses of ethical theories. |
| C445.3 | To analyze the various social issues, industrial standards, code of ethics, global issues and role of professional ethics in engineering field. |
| C445.4 | To validate the responsibilities of an engineer for safety and risk benefit analysis, professional rights and Responsibilities of an engineer. |
| C445.5 | To create awareness on a variety of global issues and devise ethical principles to resolve situations that arise in their professional and personal lives. |

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|-------------|---------------|--------------------------------|
| C448 | EC8094 | Satellite Communication |
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Course Outcomes (Cos)

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|---------------|--|
| C448.1 | Describe the satellite orbits and launch methodologies |
| C448.2 | Discuss the concept of space segment |
| C448.3 | Analyze the link design of satellites |
| C448.4 | Use different access techniques to communicate satellite systems |
| C448.5 | Understand the applications of satellite. |

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| | | |
|-------------|---------------|---------------------|
| C452 | EC8811 | Project Work |
|-------------|---------------|---------------------|

Course Outcomes (Cos)

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|---------------|--|
| C452.1 | Develop the ability to do the literature survey systematically to identify the research gap. |
| C452.2 | Develop the ability to demonstrate the problem formulated from the research gap identified through literature review. |
| C452.3 | Develop the ability to experiment / examine a specific problem by formulating proper methodologies. |
| C452.4 | Develop the ability to appraise and select the successful solution for the problem. |
| C452.5 | On completion of the project work, students will be in a position to take up challenging practical problems and find solution by formulating proper methodology. |