



Synergy Institute of Technology, Bhubaneswar

Department of Electrical Engineering

List of Courses and Course Code

| Sl. No. | Year | Sem | Course Code | Name of the Course |
|------------|------|-----|-------------|---|
| Theory | | | | |
| 1 | 1st | 1st | C101 | Mathematics - I |
| 2 | | | C102 | Physics |
| 3 | | | C103 | Basic Electrical Engineering |
| 4 | | | C104 | Programming in 'C' and Data Structure |
| 5 | | | C105 | Basic Civil Engineering |
| 6 | | | C106 | Universal Human Values |
| Laboratory | | | | |
| 7 | 1st | 1st | C107 | Physics Laboratory |
| 8 | | | C108 | Basic Electrical Engineering Lab. |
| 9 | | | C109 | Programming Lab. |
| 10 | | | C110 | Engineering Graphics & Design Lab. |
| Theory | | | | |
| 11 | 1st | 2nd | C111 | Mathematics - II |
| 12 | | | C112 | Chemistry |
| 13 | | | C113 | Basic Electronics |
| 14 | | | C114 | Engineering Mechanics |
| 15 | | | C115 | Basic Mechanical Engineering |
| 16 | | | C116 | English for Technical Writing |
| Laboratory | | | | |
| 17 | 1st | 2nd | C117 | Chemistry Laboratory |
| 18 | | | C118 | Basic Electronics Lab. |
| 19 | | | C119 | Communicative English & Report Writing Lab. |
| 20 | | | C120 | Workshop and Digital Manufacturing lab |
| Theory | | | | |
| 21 | 2nd | 3rd | C201 | Mathematics-III |
| 22 | | | C202 | Object Oriented Programming Using JAVA |
| 23 | | | C203 | Organizational Behaviour |
| 24 | | | C204 | Analog Electronics Circuit |
| 25 | | | C205 | Network Theory |
| Laboratory | | | | |
| 26 | 2nd | 3rd | C207 | Analog Electronics Circuit Lab |
| 27 | | | C208 | Network Theory Lab |
| 28 | | | C209 | OOP Using JAVA Lab |
| 29 | | | C210 | Evaluation of Internship-I |
| Theory | | | | |
| 30 | 2nd | 4th | C211 | Digital Electronics |
| 31 | | | C212 | Electrical Machines-I |
| 32 | | | C213 | Engineering Economics |
| 33 | | | C214 | Power Electronics |
| 34 | | | C215 | Electrical and Electronics Measurement |
| 35 | | | C216 | Digital Signal Processing |
| Laboratory | | | | |



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List of Courses and Course Code

| Sl. No. | Year | Sem | Course Code | Name of the Course |
|------------|------|-----|-------------|--|
| 36 | 2nd | 4th | C218 | Digital Electronics Lab |
| 37 | | | C219 | Electrical Machines-I Lab |
| 38 | | | C220 | Power Electronics Lab |
| Theory | | | | |
| 39 | 3rd | 5th | C301 | Electrical Power Transmission and Distribution |
| 40 | | | C302 | Control System |
| 41 | | | C303 | Electrical Machines-II |
| 42 | | | C304 | Industrial Process Control and Dynamics |
| 43 | | | C305 | Renewable Power Generating System |
| Laboratory | | | | |
| 44 | 3rd | 5th | C307 | Electrical Power Transmission and Distribution Lab |
| 45 | | | C308 | Control and Instrumentation Lab |
| 46 | | | C309 | Electrical Machines Lab-II |
| 47 | | | C310 | Evaluation of Summer Internship |
| Theory | | | | |
| 48 | 3rd | 6th | C311 | Power System operation and Control |
| 49 | | | C312 | Microprocessor and Microcontroller |
| 50 | | | C313 | Optimization in Engineering |
| 51 | | | C314 | Electrical Power System Protection |
| 52 | | | C315 | Artificial Intelligence and Machine Learning |
| Laboratory | | | | |
| 53 | 3rd | 6th | C317 | Power System Operation and Control Lab |
| 54 | | | C318 | Microprocessor and Microcontroller Lab |
| 55 | | | C319 | Seminar - I |
| Theory | | | | |
| 56 | 4th | 7th | C401 | Entrepreneurship Developement |
| 57 | | | C402 | Advanced Control Systems |
| 58 | | | C403 | Smart Grid |
| 59 | | | C404 | Digital VLSI Design |
| 60 | | | C405 | Green Technology |
| 61 | | | C406 | Embedded System |
| Laboratory | | | | |
| 62 | 4th | 7th | C408 | Minor Project |
| 63 | | | C409 | Seminar-II |
| 64 | | | C410 | Comprehensive Viva |
| Project | | | | |
| 65 | 4th | 8th | C411 | Major Project |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code):Mathematics-I(C101),
Year/Semester of Study:1st /1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C101.1 | Understand the technique of calculus | L2 |
| C101.2 | Understand indefinite integral , Gamma function and Beta function. | L2 |
| C101.3 | Apply the mean value theorem and power series . | L3 |
| C101.4 | Identify the application of partial derivatives . | L3 |
| C101.5 | Analyze linear system of equation and rank of a matrix . | L4 |
| C101.6 | Apply the specific properties of matrices . | L3 |

**SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR**

Department of Electrical Engineering

Course Outcome (CO)**Academic Year: 2023-24, Branch: EE , Subject(Code): Physics(C102),
Year and Semester of Study:1st /1st sem**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C102.1 | Apply knowledge of harmonic oscillations in mechanical and electrical system. | L3 |
| C102.2 | Understand the basic concept of nature of light and coherent sources of waves. | L2 |
| C102.3 | Explain the thickness of the thin film, refractive index & resolving power of grating using principle of interference & diffraction of light. | L2 |
| C102.4 | Use Maxwell's equations & time varying electric field to show the nature of propagation of EM waves & its energy through free space, non-conducting and conducting media. | L4 |
| C102.5 | Understand the Schrodinger wave equation to calculate the matter wave energy and momentum of a particle in a box. | L2 |
| C102.6 | Classify among different types of LASER and its transition probabilities. | L3 |



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Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE ,Subject(Code): Basic Electrical Engineering (103),
Year/Semester of Study:1st/1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C103.1 | Analyze fundamental laws and theorems of AC and DC circuits | L4 |
| C103.2 | Understand fundamentals of Single phase AC circuits | L2 |
| C103.3 | Analyze three phase AC circuits | L4 |
| C103.4 | Analyze magnetic circuit and its applications | L4 |
| C103.5 | Understand the fundamentals of AC machines | L2 |
| C103.6 | Understand the fundamental concept of power system | L2 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Programming in C and Data Structure(C104), Year/Semester of Study: 1st/1st

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C104.1 | Understand the basic concept of programming in 'C' | L2 |
| C104.2 | Apply simple algorithm to 'C' program | L3 |
| C104.3 | Understand programs using Function, Array, Structure and Union | L2 |
| C104.4 | Analyze the relation between memory and memory referencing with execution of the program | L4 |
| C104.5 | Apply different Data structure for Problem Solving | L3 |
| C104.6 | Understand about tree, Sorting and Searching fundamentals | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Basic Civil Engineering (105),
Year/Semester of Study: 1st/1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C105.1 | Understand the basics of civil engineering and fundamental aspects of building. | L2 |
| C105.2 | Analyze about classification of foundation and bearing capacity of soil | L4 |
| C105.3 | Understand the brief overview of general aspects of building materials. | L2 |
| C105.4 | Explain about transportation modes and planning. | L2 |
| C105.5 | Understand about drinking water standards and water treatment plant. | L2 |
| C105.6 | Discuss irrigation network system. | L3 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Universal Human Values(C106),
Year/Semester of Study:1st/1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C106.1 | Understand the essentials of human values, skills, self exploration, happiness and prosperity. | L2 |
| C106.2 | Analyze coexistence of the "I" with the body. | L4 |
| C106.3 | Identify the role of harmony in family, society and universal order. | L3 |
| C106.4 | Apply appropriate technologies and management patterns to create harmony in professional and personal lives. | L3 |
| C106.5 | Understand the holistic perception of harmony at all levels of existence | L2 |
| C106.6 | Understand about awareness in professional ethics. | L2 |

**SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR**

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Physics Lab.(C107),
Year/Semester of Study: 1st /1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C107.1 | Analyze acceleration due to gravity by using Bar pendulum and resonance using sonometer. | L4 |
| C107.2 | Understand wave length of monochromatic light by using Newton's ring apparatus and diffraction grating using spectrometer. | L2 |
| C107.3 | Analyze RLC circuit, characteristics of Bipolar Junction Transistor (BJT) and PN junction diode. | L4 |
| C107.4 | Understand the rigidity modulus by using Barton's apparatus and Young's modulus by Searle's apparatus and surface tension of capillary rise method. | L2 |
| C107.5 | Analyze the magnetic field of Helmholtz coil and e/m ratio. | L4 |

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Course Outcome (CO)

**Academic Year: 2023-24 , Branch: EE, Subject(Code): Basic Electrical Engineering Lab. (C108),
Year/Semester of Study: 1st/1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C108.1 | Understand the Preliminary Concept of Laboratory Equipments and demonstration of Cut-Out section of Machines | L2 |
| C108.2 | Analyze measurement of Field Resistance, Armature Resistance, Starting and Speed Control of D.C Machine | L4 |
| C108.3 | Understand B-H curve and Open Circuit Characteristics (O.C.C) of D.C Machine | L1 |
| C108.4 | Understand the calibration of 1-ph Energy Meter, power measurement in Single Phase Circuit , measurement of Earth Resistance and insulation resistance | L2 |
| C108.5 | Analyze Thevenin's Theorem and Norton's Theorem, V-I Characteristics of Incandescent Lamp and House Wiring. | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Programming Lab.(C109),
Year/Semester of Study:1st/1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C109.1 | Apply logical ability to solve the problems | L3 |
| C109.2 | Understand 'C' programming environment, compiling, debugging, linking and executing using the development environment | L2 |
| C109.3 | Analyze the complexity of the problems in to small modules. | L4 |
| C109.4 | Apply in-built and customized functions for solving the problems. | L3 |
| C109.5 | Apply the pointers, memory allocation techniques and files for dealing with variety of problems. | L3 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Engineering Graphic and Design Lab (C110)
, Year/Semester of Study:1st/1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C110.1 | Understand the basics of Auto-CAD to perform simple drawing using commands. | L2 |
| C110.2 | Understand free hand sketching of basic geometrical constructions and multiple views of objects using the various types of scales. | L1 |
| C110.3 | Identify different geometrical figures and engineering curves using physical instruments and Auto-CAD. | L3 |
| C110.4 | Apply the projections of points, straight lines and plane surfaces in given quadrant. | L3 |
| C110.5 | Apply projections of solids to develop geometrical surfaces. | L3 |
| C110.6 | Analyze isometric and perspective sections of simple solids. | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Mathematics (II) (C111),
Year/Semester of Study:1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C111.1 | Analyze concept of matrices for solution of linear equations | L4 |
| C111.2 | Understand about different type of matrices | L2 |
| C111.3 | Analyze the similarity of matrix and its diagonalization | L4 |
| C111.4 | Understand about vector differential calculus | L2 |
| C111.5 | Understand about vector integral calculus | L1 |
| C111.6 | Analyze the fourier transform and its application | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Chemistry(C112),
Year/Semester of Study: 1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C112.1 | Demonstrate various periodic properties associated with different elements present in different groups and periods of modern periodic table. | L4 |
| C112.2 | Understand about free energy concept of the thermodynamics associated with chemical reactions and equilibriums. | L1 |
| C112.3 | Analyze the concept of rotational and vibrational spectroscopic techniques for identification of organic and inorganic compounds. | L4 |
| C112.4 | Understand the concept of UV spectroscopy for identification of organic and inorganic compounds. | L2 |
| C112.5 | Analyze the concept of configurations and conformations of various organic compounds. | L4 |
| C112.6 | Understand the generation, reaction and identification of intermediate reactions and their applications | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Basic Electronics (C113),
Year/Semester of Study:1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C113.1 | Analyze the basic concept of semiconductor physics | L4 |
| C113.2 | Analyze the principle of operation of bipolar junction transistor (BJT) | L4 |
| C113.3 | Analyze the principle and operational characteristics of junction Field Effect Transistor(JFET) , Metal Oxide Semiconductor Field Effect Transistor (MOSFET) and Integrated Circuit (IC) | L4 |
| C113.4 | Understand the concept and application of feedback amplifier and operational amplifier (OP-AMP) | L2 |
| C113.5 | Understand the fundamentals of digital electronic circuits | L2 |
| C113.6 | Discuss about the electronic instruments and communication systems | L3 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Engineering Mechanics(C114),
Year/Semester of Study: 1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C114.1 | Understand the principle and application of concurrent forces on a plane | L1 |
| C114.2 | Analyze the fundamental principle of friction and virtual work | L4 |
| C114.3 | Explain about parallel forces on a plane | L2 |
| C114.4 | Discuss about the concept and application of moment of inertia | L3 |
| C114.5 | Understand rectilinear translation and conservation of energy | L2 |
| C114.6 | Understand curvilinear translation | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Basic Mechanical Engineering(C115),
Year/Semester of Study: 1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C115.1 | Understand the fundamental concept of thermodynamics system. | L1 |
| C115.2 | Analyze the application of thermodynamics in IC engine,refrigerator and heat pump. | L4 |
| C115.3 | Understand the concept of fluid mechanics and Heat transfer | L2 |
| C115.4 | Analyze the different manufacturing process and techniques. | L4 |
| C115.5 | Understand about the working principle of basic power transmission devices | L2 |
| C115.6 | Explain about the configuration and anatomy of Robotics | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code):English for Technical Writing (C116),
Year/Semester of Study: 1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C116.1 | Understand the concept and nature of communication and the objective of Technical communication relevant for the workplace as Engineers. | L2 |
| C116.2 | Use suitable vocabulary and grammar with confidence and express their ideas both in speech and writing. | L4 |
| C116.3 | Analyze their efficacy as fluent and efficient communicators by learning the voice dynamics. | L4 |
| C116.4 | Understand appropriate and competent professional writing skills to communicate information effectively in the organization setup. | L1 |
| C116.5 | Formulate a comprehensive, holistic and job specific chronological or functional resume, to increase employability. | L3 |
| C116.6 | Understand appropriate skills to face interviews with confidence and to develop desired corporate and social etiquettes. | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: CSE, Subject(Code):Chemistry Laboratory(117) ,
Year/Semester of Study: 1st/ 2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C117.1 | Analyze the alkalinity and hardness value of the water sample for industrial application | L4 |
| C117.2 | Analyze the concentration of Iron and calcium present in the solution for industrial application | L4 |
| C117.3 | Analyze the chlorine content and dissolve oxygen of water sample for industrial application | L4 |
| C117.4 | Apply knowledge on preparation of drugs for industrial application | L3 |
| C117.5 | Analyze viscosity and flashpoint of lubricating oils for industrial application | L4 |



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Course Outcome (CO)

**Academic Year: 2022-23, Branch: EE , Subject(Code): Basic Electronics Lab. (C118),
Year/Semester of Study: 1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C118.1 | Understand basic knowledge on Electronic Components, Devices and use of CRO | L2 |
| C118.2 | Analyze V-I Characteristics of Semiconductor Diode and Transistor | L4 |
| C118.3 | Analyze the Transfer Characteristics of JFET and MOSFET | L4 |
| C118.4 | Analyze configuration of OP-Amp, verification of Truth Table of Logic Gates and Full-Wave Rectifier, Half -wave Rectifier. | L4 |
| C118.5 | Understand implementation of digital circuit using Universal Gate, realization using universal gate Op-Amp as Integrator and Differentiator. | L1 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject (Code): Communicative English & Report writing
Lab.(C119), Year/Semester of Study: 1st/2nd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C119.1 | Discuss about self-introduction and professional presentation | L3 |
| C119.2 | Apply power presentation and situational conversational practice/Role play | L3 |
| C119.3 | Discuss review of a book/newspaper editorial/movie, coverletter and CV writing | L3 |
| C119.4 | Understand Listening Practice and Group Discussion | L2 |
| C119.5 | Discuss the Mock Interview and Reading Practice | L3 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Workshop & Digital Manufacturing Lab (120), Year/Semester of Study: 1st/2nd

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------|
| | After successful completion of course the students will be able to | |
| C120.1 | Analyze the job in fitting section lathe and turning operation | L4 |
| C120.2 | Describe the Preparation of job in black smith section to Study milling machine and milling operation | L2 |
| C120.3 | Analyze the Preparation of job in carpentry section/milling operation on CNC milling machine | L4 |
| C120.4 | Understand about CNC lathe machine and turning on CNC lathe. | L1 |
| C120.5 | Understand about Robot for picking and palletizing operation. | L2 |
| C120.6 | Analyze additive manufacturing using 3D printer and product development | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Math-III(201),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C201.1 | Understand about the numerical solution of linear equation, nonlinear equation and different type of interpolation | L2 |
| C201.2 | Analyze differentiation, integration and solution of ordinary differential equation | L4 |
| C201.3 | Demonstrate knowledge of probability distribution function | L3 |
| C201.4 | Apply fundamental knowledge on various types of probability distribution | L3 |
| C201.5 | Analyze correlation & regression theory based on sample data | L4 |
| C201.6 | Explain about testing of hypothesis | L2 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Object Oriented Programming Using JAVA (C202), Year \ Semester of Study: 2nd\3rd

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------|
| | After successful completion of course the students will be able to | |
| C202.1 | Understand the basics of object-oriented programming using C++ and JAVA | L2 |
| C202.2 | Apply the concept of classes, Java, JDK Components and develop Simple Java Programs | L3 |
| C202.3 | Develop Simple Java Programs using inheritance and Exception handling | L4 |
| C202.4 | Develop web applications and can be executed by browsers for many platforms | L4 |
| C202.5 | Develop GUI applications using Swing components and Event handling programs | L4 |
| C202.6 | Develop the animation and media | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code):Organisational Behaviour (C203),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C203.1 | Understand about the basic concept, evolution and managerial implications of organizational behaviour (OB) | L2 |
| C203.2 | Understand the importance of Right Personality, Attitude, Perception in an organization | L2 |
| C203.3 | Understand the role of Group Behaviour, ways to develop Effective Teams, Understand various Leadership style | L1 |
| C203.4 | Explain the importance of organizational culture | L2 |
| C203.5 | Understand the concept of organizational change | L2 |
| C203.6 | Analyze different Organizational Change Models and Change Intervention Methods to solve organizational problems | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Analog Electronics Circuit (C204),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C204.1 | Analyze the principle and operational characteristics of MOSFET | L4 |
| C204.2 | Understand about biasing of BJTs, FETs and MOSFETs | L2 |
| C204.3 | Explain about small signal analysis of BJT and FET | L2 |
| C204.4 | Analyze about high frequency response of BJTs and FETs | L4 |
| C204.5 | Understand the basic principle of feedback amplifier and oscillator | L1 |
| C204.6 | Analyze the OP-Amp fundamentals. | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Network Theory(C205),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C205.1 | Understand node analysis, mesh analysis and network theorem | L2 |
| C205.2 | Understand the solution of first order and second order networks | L2 |
| C205.3 | Discuss about sinusoidal steady state analysis of AC circuits | L3 |
| C205.4 | Apply laplace transform technique to analyze electrical circuits | L3 |
| C205.5 | Understand about pole-zero concept and Resonance in electrical circuits | L1 |
| C205.6 | Explain about Network Functions and Two-port networks | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Analog Electronics Circuit Lab(C207),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C207.1 | Demonstrate various biasing methods for BJT and FET circuits. | L3 |
| C207.2 | Analyze DC and AC performance of BJT, FET and MOSFET. | L4 |
| C207.3 | Explain the frequency response of BJT, FET & OP-Amp | L2 |
| C207.4 | Understand about the darlington connections, differential amplifier and band width of FET/BJT using square wave testing | L2 |
| C207.5 | Illustrate class-A/ class-B power amplifier circuit, common emitter circuit and shift register. | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Network Theory Lab(C208),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C208.1 | Demonstrate network theorems ,open circuit and short circuit parameter. | L4 |
| C208.2 | Analyze hybrid and transmission parameters of Two-port Networks and frequency response of low pass, high pass filter. | L4 |
| C208.3 | Analyze the frequency response of Band pass , Band elimination filter and self inductance, mutual inductance and coupling coefficient of single phase transformer. | L4 |
| C208.4 | Understand resonance in series and parallel R-L-C circuits using oscilloscope | L1 |
| C208.5 | Understand reciprocity theorem, Millman theorem , KCL and KVL. | L2 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): OOP Using JAVA Lab (C209), Year / Semester of Study: 2nd/3rd

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C209.1 | Write programs for solving real world problems using java collection framework | L2 |
| C209.2 | Write programs using abstract classes and classes having different forms | L2 |
| C209.3 | Demonstrate multiple flow of execution simultaneously | L3 |
| C209.4 | Write how to access through implementing various classes | L3 |
| C209.5 | Write GUI programs using Applet | L3 |
| C209.6 | Develop Exception handling mechanism | L5 |

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Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Evaluation of Internship-I (C210),
Year/Semester of Study: 2nd/3rd**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C210.1 | Understand real time problems/challenges in contemporary areas of power sector. | L2 |
| C210.2 | Analyze real-time challenges in Renewable Energy industry, green energy projects, energy efficiency, energy audit, management , policy and regulations | L4 |
| C210.3 | Explain the impact of engineering solutions, developed in a project in a global, economic, environmental, and societal context | L1 |
| C210.4 | Apply Standard Operating Procedure of industry for specific project domain | L3 |
| C210.5 | Understand the learning through project report and oral presentation | L2 |
| C210.6 | Analyze new tools and technologies for engineering application | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Digital Electronics (C211),

Year/Semester of Study: 2nd/4th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C211.1 | Analyze fundamental of digital circuits and logic family | L4 |
| C211.2 | Understand about combinational logic circuits | L2 |
| C211.3 | Understand about sequential logic circuits and systems | L2 |
| C211.4 | Discuss about analog to digital converter | L3 |
| C211.5 | Analyze about digital to analog converter | L4 |
| C211.6 | Understand semiconductor memory and programmable logic devices | L1 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Electrical Machines-I (C212),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C212.1 | Understand about the magnetic field and magnetic circuit | L2 |
| C212.2 | Explain the concept of electromechanical force and torque | L2 |
| C212.3 | Understand the working principle and operation of DC machines | L2 |
| C212.4 | Analyze the motoring and generating action of DC machine | L4 |
| C212.5 | Analyze the principle and operation of single phase transformer | L4 |
| C212.6 | Analyze the principle and operation of three phase transformer | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Engineering Economics (C213),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C213.1 | Understand the meaning and importance of demand and supply in engineering economics | L2 |
| C213.2 | Analyze the pattern of production and cost -output relationship in different scale. | L4 |
| C213.3 | Understand different market structure and its impact on price determination | L2 |
| C213.4 | Apply the different engineering formula to evaluate engineering projects | L3 |
| C213.5 | Understand the concept of national income, inflation and fiscal policy | L2 |
| C213.6 | Understand the role of RBI and commercial bank | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Power Electronics(C214),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C214.1 | Analyze semiconductor power switching devices | L4 |
| C214.2 | Understand single phase half wave , full wave,full bridge thyristor rectifier | L2 |
| C214.3 | Understand three phase half wave , full wave and full bridge thyristor rectifier | L2 |
| C214.4 | Analyze about DC-DC buck converter | L4 |
| C214.5 | Analyze about DC-DC boost converter | L4 |
| C214.6 | Understand the operation of single phase and three phase voltage source converter | L2 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Electrical and Electronics Measurement (C215), Year/Semester of Study: 2nd/4th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C215.1 | Understand about the consttuctional features, mesearment and error of electrical and electronic instruments | L2 |
| C215.2 | Analyze the measurement of resistance, inductance and capacitance. | L4 |
| C215.3 | Understand about transducer and its applications | L2 |
| C215.4 | Analyze the principle and operational features of Galvanometer and potentiometer | L4 |
| C215.5 | Understand the construction and operation of current transformer , potential transformer and electronic measuring instrument | L2 |
| C215.6 | Analyze the digital and analog oscilloscope | L4 |



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Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Digital Signal Processing(C216),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C216.1 | Analyze the fundamental concept and classification of discrete time systems | L4 |
| C216.2 | Apply Z- Transform and inverse Z-Transform to analyze linear time invariant system | L3 |
| C216.3 | Explain about discrete fourier Transform and its properties | L2 |
| C216.4 | Discuss about efficient computation of Discrete Fourier Transform (DFT) | L3 |
| C216.5 | Analyze structure and implementation of Finite Impulse Response (FIR) filter and Infinite Impulse Response (IIR) filter | L4 |
| C216.6 | Understand the structure and application of analog filters and basic adaptive filter | L2 |

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Digital Electronics Lab.(C218),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C218.1 | Understand about the practical knowledge of Digital Logic Circuits and Gate Level Minimization | L2 |
| C218.2 | Analyze the design of Combinational Logic Circuit using NAND and NOR gate | L4 |
| C218.3 | Demonstrate Multiplexer and De-multiplexer and different types of Flip-Flops | L4 |
| C218.4 | Analyze the design of Shift Register, Counter and parallel adder | L4 |
| C218.5 | Demonstrate the binary multiplier circuit, 2-bit Comparator and Universal S | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Electrical Machines-I Lab.(C219),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C219.1 | Analyze Open Circuit (OC) Test, Short Circuit (SC) Test and Parallel Operation of single phase transformer | L4 |
| C219.2 | Analyze Back-to-Back Test, Open Delta and Scott Connection of two single phase transformer | L4 |
| C219.3 | Understand Speed Control, No-Load Test and Blocked Rotor Test of three phase induction motor | L2 |
| C219.4 | Understand the Torque-Slip Characteristics of three phase Induction Motor by Brake Test and different Single Phase Induction Motor. | L2 |
| C219.5 | Analyze Starting of DC Shunt Motor and O.C.C of DC Shunt Generator | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Power Electronics Lab.(C220),
Year/Semester of Study: 2nd/4th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C220.1 | Analyze the V-I Characteristics of SCR, TRIAC, IGBT, MOSFET and Cosine Controlled Triggering Circuit | L4 |
| C220.2 | Describe Latching Current, Holding Current, Single Phase full Wave mid-point and bridge type rectifier circuit. | L3 |
| C220.3 | Analyze three Phase Fully Controlled Rectifier Circuit and single phase PWM voltage source inverter. | L4 |
| C220.4 | Demonstrate three Phase VSI with PWM control, Forward Converter and Flyback Converter | L4 |
| C220.5 | Describe the operation of thyristor based and TRIAC based AC voltage regulator. | L3 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE , Subject(Code):Electrical Power Transmission and Distribution (C301), Year/Semester of Study: 3rd/5th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C301.1 | Understand about evolution, present day scenario and structure of power system | L2 |
| C301.2 | Analyze inductance and capacitance of three phase transmission line with symmetrical and unsymmetrical spacing | L4 |
| C301.3 | Analyze the electrical design and mechanical design and performance of short, medium and long overhead transmission line | L4 |
| C301.4 | Describe symmetrical balanced and unbalanced fault calculation | L3 |
| C301.5 | Classify distribution system in a transmission line | L1 |
| C301.6 | Explain about under ground cables and power system earthing | L2 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Contron System(C302) ,
Year/Semester of Study: 3rd/5th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C302.1 | Analyze the Block Diagram and Signal Flow Graph of control system | L4 |
| C302.2 | Understand time response of first and second order system with standard test inputs | L2 |
| C302.3 | Understand the concept of absolute and relative stability | L2 |
| C302.4 | Analyze stability of a system using frequency and time response plot | L4 |
| C302.5 | Understand about steady state stability, transient stability, PID controller and lag-lead compensator | L2 |
| C302.6 | Analyze the concept of State Space Model of linear discrete time system | L4 |

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code):Electrical Mechines -II (C303),
Year/Semester of Study: 3rd/5th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C303.1 | Understand various types of windings in electrical machines | L2 |
| C303.2 | Analyze about pulsating and revolving magnetic field | L4 |
| C303.3 | Understand the principle, working , starting and speed control of three phase induction motor | L2 |
| C303.4 | Understand about the operation and starting of single phase induction motor | L2 |
| C303.5 | Analyze the performance of cylindrical rotor and salient pole synchronous generator | L4 |
| C303.6 | Analyze the parallel operation, and load sharing in a synchronous generator | L4 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Industrial Process Control and Dynamics (C304), Year/Semester of Study: 3rd/5th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C304.1 | Analyze industrial process control and analog signal conditioning | L4 |
| C304.2 | Analyze digital signal conditioning | L4 |
| C304.3 | Understand thermal sensor and mechanical sensor | L2 |
| C304.4 | Discuss optical sensor and final control | L3 |
| C304.5 | Discuss discrete state process control | L3 |
| C304.6 | Understand analog and digital controller | L2 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE , Subject(Code):Renewable Power Generation System (C305), Year/Semester of Study: 3rd/5th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C305.1 | Distinguish between conventional and Non-conventional source of energy | L3 |
| C305.2 | Understand the Principle and application of solar power plants | L2 |
| C305.3 | Analyze principle and operation of wind energy system | L4 |
| C305.4 | Describe the Principle and application of induction generator and reactive power compensation. | L2 |
| C305.5 | Analyze the principle and application of biomass power | L4 |
| C305.6 | Understand the operation of different hybrid power plants and their needs | L2 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Electrical Power Transmission and Distribution Lab. (C307) ,Year/Semester of Study: 3rd/5th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C307.1 | Analyze Ferranti Effect in transmission lines and Oil Testing of Transformer | L4 |
| C307.2 | Understand String Efficiency and ABCD parameters in Transmission Lines | L2 |
| C307.3 | Analyze Earth Resistance, Computation of Series and Shunt capacitance in Transmission Line | L4 |
| C307.4 | Analyze the various types of Lightning Arrester and power factor improvement using switched capacitor. | L4 |
| C307.5 | Understand different type of insulators and cables. | L2 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Control and Instrumentation Lab.(308),
Year/Semester of Study: 3rd/5th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C308.1 | Demonstrate Position Control System and Two Phase A.C Servomotor Characteristics. | L3 |
| C308.2 | Understand frequency response of Lag-Lead Compensators , temperature control system and position control using synchroscope | L2 |
| C308.3 | Analyze strain gauge, J-type thermocouple and LVDT. | L4 |
| C308.4 | Understand measurement of resistance, inductance and capacitance using bridges and callibration of induction motor | L1 |
| C308.5 | Understand the charecteristics of theristor and open loop response using inductive proximity sensor. | L1 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Electrical Machines-II Lab. (C309),
Year/Semester of Study: 3rd/5th**

| Cos | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C309.1 | Understand Voltage Regulation of Alternator and V-Curves of Synchronous Motor | L2 |
| C309.2 | Analyze parameters of Synchronous Machine by Sequence Reactance Method and capacitor start single phase induction motor. | L4 |
| C309.3 | Analyze Parallel Operation of two alternators and slip test of synchronous machine. | L4 |
| C309.4 | Understand No-Load Test, Blocked Rotor Test and slip torque characteristics of three phase induction motor. | L2 |
| C309.5 | Analyze 4-point starter and DOL starter. | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Evaluation of Summer Internship (C310) ,
Year/Semester of Study: 3rd/5th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C310.1 | Understand real time problems/challenges in contemporary areas of power sector. | L2 |
| C310.2 | Analyze real-time challenges in Renewable Energy industry, green energy projects, energy efficiency, energy audit, management , policy and regulations | L4 |
| C310.3 | Explain the impact of engineering solutions, developed in a project in a global, economic, environmental, and societal context | L2 |
| C310.4 | Apply Standard Operating Procedure of industry for specific project domain | L3 |
| C310.5 | Understand the learning through project report and oral presentation | L2 |
| C310.6 | Analyze new tools and technologies for engineering application | L4 |



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Department of Electrical Engineering

Course Outcome (CO)

Academic Year: 2023-24, Branch: EE , Subject(Code): Power System Operation and Control(C311),Year/Semester of Study: 3rd/6th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------|
| | After successful completion of course the students will be able to | |
| C311.1 | Analyze the structure of power system and power flow equations | L4 |
| C311.2 | Understand application of numerical methods for solution of power flow equations | L2 |
| C311.3 | Discuss about economic operation and management of power system | L3 |
| C311.4 | Analyze voltage and frequency control in a power system | L4 |
| C311.5 | Understand about Automatic Load Flow Control (ALFC) of single and two area system | L2 |
| C311.6 | Analyze stability in a power system | L4 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code): Microprocessor and Microcontroller (C312), Year/Semester of Study: 3rd/6th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------|
| | After successful completion of course the students will be able to | |
| C312.1 | Understand the organization and architecture of microprocessor | L2 |
| C312.2 | Understand the hardware architecture and system configuration of 8086 microprocessor | L2 |
| C312.3 | Analyze instruction set assembly language programming of 16- bit microprocessor | L4 |
| C312.4 | Discuss about Interfacing of microprocessor peripherals | L3 |
| C312.5 | Understand hardware architecture, instruction set and programming of 8-bit microprocessor | L2 |
| C312.6 | Classify different types of interfacing in microprocessor | L1 |

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code):Optimization in Engineering(C313),
Year/Semester of Study:3rd Year/6th Sem**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C313.1 | Analyze optimization as mathematical programming problems. | L4 |
| C313.2 | Apply classical optimization techniques to solve linear programming problems. | L3 |
| C313.3 | Apply classical optimization techniques to solve linear programming problems (Transportation problems, Assignment problems and IPP) | L3 |
| C313.4 | Understand classical optimization techniques to solve nonlinear optimization problems. | L2 |
| C313.5 | Explain about Evolutionary algorithms to find global optimum of nonlinear optimization problems. | L2 |
| C313.6 | Understand Queuing Theory. | L2 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE , Subject(Code): Electrical Power System

Protection(C314),Year/Semester of Study:3rd/6th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C314.1 | Understand the nature and causes of various fault in a power system | L2 |
| C314.2 | Analyze the principle and operation of different relays | L4 |
| C314.3 | Understand protection of various apparatus in a power system | L2 |
| C314.4 | Analyze the working principle and operation of numerical relays | L4 |
| C314.5 | Discuss about switchgears | L3 |
| C314.6 | Analyze different types of circuit breakers | L4 |



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Course Outcome (CO)

Academic Year: 2023-24 , Branch: EE, Subject(Code): Artificial Intelligence and Machine Learning (C315), Year/Semester of Study: 3rd/6th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------|
| | After successful completion of course the students will be able to | |
| C315.1 | Identify appropriate AI methods to solve a given problem. | L3 |
| C315.2 | Interpret the knowledge using logic concepts | L4 |
| C315.3 | Solve the problem using probabilistic methods | L3 |
| C315.4 | Describe various methods of machine learning | L2 |
| C315.5 | Compare and contrast the different expert systems | L1 |
| C315.6 | Manipulate representations of numbers stored in digital computers | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24 , Branch: EE, Subject(Code): Power System Operation and Control Lab.
(C317), Year/Semester of Study: 3rd/6th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C317.1 | Analyze the Sequence Reactance and Sub-Transient Reactance of Alternator | L4 |
| C317.2 | Analyze Fault Current of different types of faults and inverse Definite Minimum Time (IDMT) Over-Current Relay. | L4 |
| C317.3 | Understand characteristics of Percentage Biased Over-Current Relay and Y-Bus Matrix of a Power Network. | L2 |
| C317.4 | Analyze the Symmetrical and Unsymmetrical Fault in a Power System | L4 |
| C317.5 | Analyze string insulator, current transformer (CT) and potential transformer (PT). | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Microprocessor and Microcontroller Lab.
(C318), Year/Semester of Study: 3rd/6th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C318.1 | Analyze Sorting, Searching and 16- bit Arithmetic Operation programming using 8086 | L4 |
| C318.2 | Analyze Digital Clock, Stop Watch and String Manipulation Operation programming using 8086. | |
| C318.3 | Understand Interfacing of DAC & ADC, and Parallel Communication Technique using 8255 | L2 |
| C318.4 | Understand Stepper Motor (D.C Motor Speed Control), Arithmetic, Logical Programming, Timer, Interrupt and UART Operation programming. | L2 |
| C318.5 | Analyze 10's Complement of a BCD number, Up/Down Counter and Design Problem using 8051 | L4 |



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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Seminar -I (C319) ,
Year/Semester of Study: 3rd/6th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C319.1 | Analyze topics on modern technology to prepare slides for power point presentation. | L4 |
| C319.2 | Apply knowledge on modern technology by referring the journals/ magazines | L3 |
| C319.3 | Describe any topic before huge Audience without fear and with a voice clarity, good gate up and proper body language | L3 |
| C319.4 | Explain their communication skill. | L2 |
| C319.5 | Analyze detail report on any topic related to modern technology in the prescribed format. | L4 |
| C319.6 | Analyze any National or International Seminar. | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Entrepreneurship Development (C401) ,
Year/Semester of Study: 4th/7th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C401.1 | Understand the Concept of Entrepreneurship and skills of Entrepreneurs | L2 |
| C401.2 | Analyze business environment to identify business opportunities and preparation of Preliminary & detailed Project Report. | L4 |
| C401.3 | Understand about the Environment Protection Acts, rules and regulations to start a new venture | L2 |
| C401.4 | Apply Entrepreneurial Strategies to manage an enterprise | L3 |
| C401.5 | Identify the causes of industrial sickness and remedial measures to revive sick industry | L3 |
| C401.6 | Understand the role of Government Bank to revive sick units | L2 |

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Advanced Control Systems (C402),
Year/Semester of Study: 4th/7th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C402.1 | Analyze discrete type control system and Z -transform | L4 |
| C402.2 | Discuss about Z-plane analysis and stability analysis of discrete time control system | L3 |
| C402.3 | Understand state variable analysis and design of control system | L2 |
| C402.4 | Analyze diagonalisation, concept of controllability , observability and pole placement method of discrete time control system | L3 |
| C402.5 | Discuss about nonlinear system by phase plane method and describe function method | L3 |
| C402.6 | Understand stability of nonlinear system by using Liapunov's stability criterion | L2 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code):Smart Grid(C403),
Year/Semester of Study:4th/7th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C403.1 | Understand concept and functions of smart grid. | L2 |
| C403.2 | Understand the application of smart meters and smart sensors for automation | L2 |
| C403.3 | Analyze phase measurement , wide area measurement and control grid concept | L4 |
| C403.4 | Understand about energy storage system for protection and control of microgrid | L2 |
| C403.5 | Understand about distributed generation concept of microgrid | L2 |
| C403.6 | Analyze power quality issues and audit of grid connected renewable energy sources. | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code):Digital VLSI Design (C404),

Year/Semester of Study: 4th/7th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C404.1 | Demonstrate the concepts of VLSI design, fabrication of MOSFET and MOS transistor | L4 |
| C404.2 | Explain the static and switching characteristics of MOS inverter | L2 |
| C404.3 | Discuss about combinational MOS logic circuit | L3 |
| C404.4 | Analyze Sequential MOS and dynamic logic circuits. | L4 |
| C404.5 | Analyze about design for testability | L4 |
| C404.6 | Summarize the Semiconductor memories-DRAM, SRAM and Flash Memory | L1 |

**SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR**

Department of Electrical Engineering

Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code): Green Technology(405),
Year/Semester of Study: 4th/7th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C405.1 | Understand the causes of production of green house gases and it's effect on the environment. | L2 |
| C405.2 | Explain the basic actions to prevent global warming and climate change. | L1 |
| C405.3 | Understand the impact knowledge on the methods of reducing CO ₂ level in atmosphere | L2 |
| C405.4 | Understand the importance of alternative energy sources for energy production | L2 |
| C405.5 | Understand the principles of green building technology and energy conservation measures. | L1 |
| C405.6 | Analyze the measures used on modern technology to reduce the climate change. | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code): Embedded System (C406),
Year / Semester of Study: 3rd/7th Sem**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C406.1 | Understand different embedded processors and systems. | L2 |
| C406.2 | Describe about ARM pipeline and ISA architecture. | L3 |
| C406.3 | Understand different interfacing devices and drivers | L2 |
| C406.4 | Discuss about real time operating system. | L3 |
| C406.5 | Explain model designing and programming of embedded system | L2 |
| C406.6 | Analyze low power embedded system. | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code):Minor Project (C408),
Year/Semester of Study: 4th/7th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C408.1 | Identify inovative projects, which is feasible, cost effective, eco-friendly and safety. | L3 |
| C408.2 | Explain the relationship between project, its literature and applicability to socity from lab to land | L2 |
| C408.3 | Analyze properly to complete the project within the schedule time. | L4 |
| C408.4 | Understand all relevant testing after execution of the project to analyse the test results for future research. | L2 |
| C408.5 | Demonstrate any project with proper methodology and in a team spirit. | L4 |
| C408.6 | Complete thesis / project report as per standard norm. | L4 |



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Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code):Seminar -II (C409),

Year/Semester of Study: 4th/7th

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C409.1 | Analyze topics on modern technology to prepare slides for power point presentation. | L4 |
| C409.2 | Apply knowledge on modern technology by referring the journals/ magazines | L3 |
| C409.3 | Describe any topic before huge Audience without fear and with a voice clarity, good gate up and proper body language | L3 |
| C409.4 | Explain their communication skill. | L2 |
| C409.5 | Analyze detail report on any topic related to modern technology in the prescribed format. | L4 |
| C409.6 | Analyze any National or International Seminar. | L4 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE , Subject(Code):Comprehensive Viva (C410),
Year/Semester of Study: 4th/7th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C410.1 | Apply knowledge and skills to face the interview panel. | L3 |
| C410.2 | Analyse and respond effectively to responde the questions by the panel members. | L4 |
| C410.3 | Apply the technical knowledge and skills in the most efficient way to answer the questions | L3 |
| C410.4 | Demonstrate the application of technical knowledge acquired in the four years to solve the problems of the various forms in organisations/instituions. | L4 |
| C410.5 | Understand the practical difficulties in applying the various forms of solutions to find a feasible solution. | L2 |
| C410.6 | Solve the real life problems to assess the implications of various forms of solutions. | L3 |



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

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Course Outcome (CO)

**Academic Year: 2023-24, Branch: EE, Subject(Code):Major Project(C411),
Year/Semester of Study:4th/8th**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|------------------------------|
| | After successful completion of course the students will be able to | |
| C411.1 | Identify inovative projects, which is feasible, cost effective, eco-friendly and safety. | L3 |
| C411.2 | Explain the relationship between project, its literature and applicability to socity from lab to land | L2 |
| C411.3 | Analyze properly to complete the project within the schedule time. | L4 |
| C411.4 | Understand all relevant testing after execution of the project to analyse the test results for future research. | L2 |
| C411.5 | Demonstrate any project with proper methodology and in a team spirit. | L4 |
| C411.6 | Complete thesis / project report as per standard norm. | L4 |

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CO-PO Mapping & Justification

[illegible]



SYNERGY INSTITUTE OF TECHNOLOGY, BHUBANESWAR

Department of Electrical Engineering

Course Outcome (CO)

Academic Year: 2023-24, Branch: EE, Subject(Code):Mathematics-I(C101),

Year/Semester of Study:1st /1st

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C101.1 | Understand the technique of calculus | L2 |
| C101.2 | Understand indefinite integral , Gamma function and Beta function. | L2 |
| C101.3 | Apply the mean value theorem and power series . | L3 |
| C101.4 | Identify the application of partial derivatives . | L3 |
| C101.5 | Analyze linear system of equation and rank of a matrix . | L4 |
| C101.6 | Apply the specific properties of matrices . | L3 |

Academic Year: 2023-24, Branch: EE, Subject(Code):Mathematics-I(C101),

Year/Semester of Study:1st /1st

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|--|------------------------------|
| | After successful completion of course the students will be able to | |
| C101.1 | Understand the technique of calculus | L2 |
| C101.2 | Understand indefinite integral , Gamma function and Beta function. | L2 |
| C101.3 | Apply the mean value theorem and power series . | L3 |

| | | |
|---------------|--|-----------|
| C101.4 | Identify the application of partial derivatives . | L3 |
| C101.5 | Analyze linear system of equation and rank of a matrix . | L4 |
| C101.6 | Apply the specific properties of matrices . | L3 |

**Academic Year: 2023-24, Branch: EE, Subject(Code):Mathematics-I(C101),
Year/Semester of Study:1st /1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|---------------------------------------|
| | After successful completion of course the students will be able to | |
| C101.1 | Understand the technique of calculus | L2 |
| C101.2 | Understand indefinite integral , Gamma function and Beta function. | L2 |
| C101.3 | Apply the mean value theorem and power series . | L3 |
| C101.4 | Identify the application of partial derivatives . | L3 |
| C101.5 | Analyze linear system of equation and rank of a matrix . | L4 |
| C101.6 | Apply the specific properties of matrices . | L3 |

**Academic Year: 2023-24, Branch: EE, Subject(Code):Mathematics-I(C101),
Year/Semester of Study:1st /1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|------------|---|---------------------------------------|
| | After successful completion of course the students will be able to | |

| | | |
|---------------|--|-----------|
| C101.1 | Understand the technique of calculus | L2 |
| C101.2 | Understand indefinite integral , Gamma function and Beta function. | L2 |
| C101.3 | Apply the mean value theorem and power series . | L3 |
| C101.4 | Identify the application of partial derivatives . | L3 |
| C101.5 | Analyze linear system of equation and rank of a matrix . | L4 |
| C101.6 | Apply the specific properties of matrices . | L3 |

**Academic Year: 2023-24, Branch: EE, Subject(Code):Mathematics-I(C101),
Year/Semester of Study:1st /1st**

| COs | CO Statements | Bloom's Taxonomy Level |
|---------------|---|---------------------------------------|
| | After successful completion of course the students will be able to | |
| C101.1 | Understand the technique of calculus | L2 |
| C101.2 | Understand indefinite integral , Gamma function and Beta function. | L2 |
| C101.3 | Apply the mean value theorem and power series . | L3 |
| C101.4 | Identify the application of partial derivatives . | L3 |
| C101.5 | Analyze linear system of equation and rank of a matrix . | L4 |
| C101.6 | Apply the specific properties of matrices . | L3 |

Department of Electrical Engineering

**Course Outcomes (COs)
of All Courses**

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