

Department of Electrical Engineering

SEMESTER - III

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Engineering Mathematics-III | |
| COURSE CODE: | EL211 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.SRK |

Course Outcomes:

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|----------------|---|
| EL211.1 | Student can solve problems of linear differential equation. |
| EL211.2 | Students can apply Laplace transform to solve problems of electrical fields. |
| EL211.3 | Student can apply Z transform under different conditions and can derive equation from them. |
| EL211.4 | Student can able to understand Fourier series |
| EL211.5 | Student can analyze the functions of complex variable. |



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Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Electrical Machines-I | |
| COURSE CODE: | EL212 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AVP |

Course Outcomes:

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|----------------|---|
| EL212.1 | Student will be able to analyze performance of DC generators and motors |
| EL212.2 | Student will be able to examine performance of single phase and three phase transformer |
| EL212.3 | Students will be able to identify applications of DC machines & transformer in power sector |



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Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | ELECTRICAL MEASUREMENT AND INSTRUMENTATION | |
| COURSE CODE: | EL214 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

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|----------------|---|
| EL214.1 | The students will be able to use Analog instruments in practical applications |
| EL214.2 | The students will be able to apply potentiometer & bridges for measurements of resistance, Inductance & capacitance |
| EL214.3 | The students will be able to find the applications of instrument transformer and data acquisition system for sensing & control of electrical quantity |
| EL214.4 | • The students will be able to use digital instruments for various measurements. |



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Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | POWER SYSTEM-I | |
| COURSE CODE: | EL215 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|----------------|---|
| EL215.1 | Student will be able to understand operation of different power plants |
| EL215.2 | Student will be able to analyze economic aspects of power system |
| EL215.3 | Student will be able to investigate need and areas of application for non-conventional energy sources |
| EL215.4 | Students will be able to understand overhead structure of power system. |

Department of Electrical Engineering

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|------------------------|------------------------|--|-----------------|
| NAME OF COURSE: | | ELECTRONIC DEVICES & CIRCUITS | |
| COURSE CODE: | EL216 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.SPS |

Course Outcomes:

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|----------------|---|
| EL216.1 | Students will be able to design transistorized circuits based on their conceptual and analytical understanding of BJT |
| EL216.2 | Students will be able to analyze FET circuits |
| EL216.3 | Students will be able to analyze the Power amplifiers, feedback amplifiers, oscillator's concepts |
| EL216.4 | Students will be able to design unregulated power supplies for practical applications |

Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | OBJECT ORIENTED PROGRAMMING WITH C++ | |
| COURSE CODE: | EL127 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.LCM |

Course Outcomes:

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|----------------|--|
| EL127.1 | Students will be able to read, understand and analyze simple C++ program |
| EL127.2 | Students will be able to apply principle of OOP concept and explore their skill to develop Complex C++ program |
| EL127.3 | Students will be able to write the simple object oriented programs in C++ using objects and classes |
| EL127.4 | Students will be able to develop the applications using object oriented programming with C++ |

Department of Electrical Engineering

SEMESTER -IV

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Numerical Methods and Linear Algebra | |
| COURSE CODE: | EL221 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.SRK |

Course Outcomes:

| | |
|----------------|--|
| EL221.1 | Student can solve numerical problems on to find roots of algebraic and transcendental equations |
| EL221.2 | Student will demonstrate understanding and implementation of numerical solution algorithms |
| EL221.3 | Student will be able to solve differential equations and eigen value problems numerically |
| EL221.4 | Student will demonstrate an ability to identify, formulate and solve electrical Problems using matrix method |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | ELECTRICAL MACHINES – II | |
| COURSE CODE: | EL222 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AVP |

Course Outcomes:

| | |
|----------------|--|
| EL222.1 | Students will be able to analyze performance of three phase as well as single phase Induction Motors |
| EL222.2 | Students will be able to identify applications of Induction Motors in industries & power sector |
| EL222.3 | Students will be able to analyze performance of synchronous machines |
| EL222.4 | Students will be able to identify applications of synchronous machines in industries & power sector |



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| | | | |
|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | POWER SYSTEM-II | |
| COURSE CODE: | EL223 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|----------------|--|
| EL223.1 | Students will be able to understand overall structure of power |
| EL223.2 | Students will be able to understand mechanical design of transmission lines |
| EL223.3 | Students will be able to implement the knowledge to design underground power distribution system |
| EL223.4 | Students will be able to analyze various performance parameters of transmission lines |

Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | ANALOG AND DIGITAL INTEGRATED CIRCUITS | |
| COURSE CODE: | EL224 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|-----------------|---|
| EL224.1 | Students will be able to analyze the differential amplifier |
| EL224.2. | Students will be able to define specification and parameters of Op |
| EL224.3 | Students will be able to analyze open loop as well as closed loop circuit configurations of operational amplifier |
| EL224.4 | Students will be able to design the combinational as well as sequential logic circuits |



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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | NETWORK ANALYSIS | |
| COURSE CODE: | EL225 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AVP |

Course Outcomes:

| | |
|----------------|---|
| EL225.1 | Develop strong basics for network theory |
| EL225.2 | Develop the problem solving technique for networks by application of theorems |
| EL225.3 | Understand the behavior of the network by analyzing its transient response |



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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Computer Aided Design and Simulation | |
| COURSE CODE: | EL226 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | S.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.LCM |

Course Outcomes:

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|----------------|---|
| EL226.1 | Create Design of various devices used in electrical engineering |
| EL226.2 | Handle design software for different applications in electrical engineering. |
| EL226.3 | Understand steady state analysis of various electrical devices through simulation |
| EL226.4 | Handle Simulation software for different applications in electrical engineering. |



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Department of Electrical Engineering

SEMESTER - V

| | | | |
|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | POWER SYSTEM-III | |
| COURSE CODE: | EL 311 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

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|-----------------|--|
| EL 311.1 | Draw a single line diagram of a given power system network |
| EL 311.2 | Evaluate the required circuit breaker rating under different fault conditions. |
| EL 311.3 | Analyze power flow equation for the solution of different load flow problems. |
| EL 311.4 | Analyze the steady state and transient stability of a power system using analytical methods. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Linear Control System | |
| COURSE CODE: | EI312 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.VSB |

Course Outcomes:

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|----------------|--|
| EI312.1 | Explain basic terminologies and applications of control systems |
| EI312.2 | Derive mathematical model and determine the transfer function of a given control system through various techniques |
| EI312.3 | Compute the time response and stability the given system |
| EI312.4 | Analyze the given control system in time and frequency domain |



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|------------------------|------------------------|--|-----------------|
| NAME OF COURSE: | | Advanced Microcontroller System | |
| COURSE CODE: | EL313 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

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|----------------|---|
| EL313.1 | Understand the basics of Microcomputer systems |
| EL313.2 | Understand the architecture and addressing modes of 8051 |
| EL313.3 | Develop program in assembly language and C language for 8051. |
| EL313.4 | Interface a microcontroller 8051 to various devices |
| EL313.5 | Understand the architecture of advanced microcontrollers. |
| EL313.6 | Develop various applications of 8051 in Electrical Engineering. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Electromagnetic Engineering | |
| COURSE CODE: | EL314 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.SSK |

Course Outcomes:

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|----------------|--|
| EL314.1 | Student can solve numerical problems on different coordinate systems, divergence, curl and gradient. |
| EL314.2 | Student can derive basic laws of electrostatics and magneto statics and can apply them for different fields. |
| EL314.3 | Students can analyse boundary conditions for conductors and dielectric |
| EL314.4 | Student can derive Maxwell's equations under different conditions |

Department of Electrical Engineering

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|------------------------|------------------------|--|-----------------|
| NAME OF COURSE: | | Open Elective-I | |
| | | INFORMATION TECHNOLOGY AND MANAGEMENT | |
| COURSE CODE: | EL315 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

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|----------------|---|
| EL315.1 | Student can present case studies about changing face of business and importance of management information system for today's business |
| EL315.2 | Along with the examples student can explain different e |
| EL315.3 | Student can describe necessity and benefits of data management for business and organizations |
| EL315.4 | Student can present examples of primary and higher organizational applications of information system |
| EL315.5 | Student can illustrate software development life cycle and can describe popular software models |
| EL315.6 | Student can describe various social and ethical issues related to IT. |

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Open Elective-I | |
| | | Advanced Electric Machines | |
| COURSE CODE: | EL315 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

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|----------------|--|
| EL315.1 | Can analyze, examine, and identify applications of Synchronous Reluctance Motors and different stepping motors. |
| EL315.2 | Can analyze, examine, and identify applications of Switched Reluctance Motors. |
| EL315.3 | Can analyze, examine, and identify applications of Permanent Magnet Brushless dc motors and Permanent magnet Synchronous Motors. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Open Elective-I | |
| | | Business Ethics | |
| COURSE CODE: | EL315 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|----------------|--|
| EL315.1 | Elaborate concepts of ethics and related theories |
| EL315.2 | Describe and apply tools for decision making and management in business ethics |
| EL315.3 | Understand and form the ethical issues in corporation |
| EL315.4 | Understand and identify the ethical issues from various stakeholders' point of context |



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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Open Elective-I Managerial Economics | |
| COURSE CODE: | EL315 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

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|----------------|---|
| EL315.1 | Elaborate the concepts of managerial economics |
| EL315.2 | Analyse the issues related to demand, supply and market |
| EL315.3 | Use different tools for demand analysis and forecasting |
| EL315.4 | Analyse the production and cost functions |
| EL315.5 | Decide price based on market, demand and supply |



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Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Electrical Workshop | |
| COURSE CODE: | EL317 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.MTS |

Course Outcomes:

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|----------------|--|
| EL317.1 | can apply workshop equipment |
| EL317.2 | can prepare the PCB in the practical field. |
| EL317.3 | can install the earthing for different equipment |
| EL317.4 | can find the faults in the circuits by troubleshooting |



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Department of Electrical Engineering

SEMESTER – VI

| | | | |
|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Electrical Machines Design | |
| COURSE CODE: | EL321 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.MTS |

Course Outcomes:

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|----------------|--|
| EL321.1 | Student will get a basic knowledge to design a transformer |
| EL321.2 | Student will get a basic knowledge to design a DC Machine |
| EL321.3 | Student will get a basic knowledge to design a three phase Induction motor |
| EL321.4 | Student will get a basic knowledge to design a Synchronous machine. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Electrical Utilization | |
| COURSE CODE: | EL331 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.SSK |

Course Outcomes:

| | |
|-----------------|--|
| EL 322.1 | Students will be able to design a suitable scheme of speed control for the traction systems. |
| EL 322.2 | Students will be able to understand different controlling methods |
| EL 322.3 | Students will be able to identify a heating/ welding scheme for a given application. |
| EL 322.4 | Students will be able to identify/ Trouble shoot various lamps and fittings in use. |
| EL 322.5 | Students will be able to understand the importance of maximizing the energy efficiency by its optimum utilization and mould their practical work in professional world accordingly |



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Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Power Electronics & Industrials Drives | |
| COURSE CODE: | EL 323 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|-----------------|--|
| EL 323.1 | Understand the fundamental principles and applications of power electronics circuits |
| EL 323.2 | Solve problems and design switching regulators according to specifications |
| EL 323.3 | Use Computer-aided techniques for the design of power converter circuits. |
| EL 323.4 | Appreciate the latest developments in power electronics. |
| EL 323.5 | Assimilate new technological and development in related field |
| EL 323.6 | Analyze and solve numerical problems on electrical drives. |
| EL 323.7 | Apply the knowledge to practical industrial systems. |



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Department of Electrical Engineering

| | | | |
|------------------------|--------------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | Advanced Control System | | |
| COURSE CODE: | EL324 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

| | |
|----------------|---|
| EL324.1 | Students will be able to design the controller in time and frequency domain |
| EL324.2 | Students will be able to examine and design the control system in modern approach |
| EL324.3 | Students will be able to analyze the nonlinear control systems |
| EL324.4 | Students will be able to analyze the Discrete Time Control Systems |

Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Open Elective-II Operating Systems | |
| COURSE CODE: | EL325 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|-----------------|---|
| EL325.1 | Student can identify and describe structure, operations, and different types of operating system. |
| EL325.2 | Student can describe the concept of process and inter process communication. |
| EL325.3 | Student can analyze effect of different scheduling criteria on scheduling techniques. |
| EL325.4 | Student can describe deadlock condition and implement methods to overcome deadlock |
| EL325.5. | Student can analyze memory management concepts like logical and physical addressing |
| EL325.6 | Student can make use of file systems, directories and different commands associated to it. |



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| | | | |
|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Open Elective-II Renewable Energy Sources | |
| COURSE CODE: | EL325 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|----------------|---|
| EL325.1 | Students will be able to design the controller in time and frequency domain |
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Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | Open Elective-II Operating Systems | |
| COURSE CODE: | EL325 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AKK |

Course Outcomes:

| | |
|----------------|--|
| EL325.1 | Demonstrate working of optical fiber |
| EL325.2 | Explain transmission characteristics of optical fibers & concept of optical joints. |
| EL325.3 | Illustrate different optical sources & optical detectors |
| EL325.4 | Solve the numerical to calculate the various parameters of optical sources & detectors |
| EL325.5 | Explain the different types of optical amplifier & optical networks |
| EL325.6 | Analyze the functional blocks in optical communication system. |



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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Open Elective-II | |
| | | Sensors and Applications | |
| COURSE CODE: | EL325 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|----------------|---|
| EL325.1 | Elaborate the concept of sensors and its characteristics |
| EL325.2 | Describe the working principle of analog and digital sensors |
| EL325.3 | Design sensor interface circuits for a given engineering problem. |
| EL325.4 | Select an appropriate sensor for a given engineering application based on interface technique, material and technology of a sensor. |
| EL325.5 | Describe the working principle of different types of actuators. |

Department of Electrical Engineering

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|------------------------|------------------------|---------------------------------------|-----------------|
| NAME OF COURSE: | | HYBRID ELECTRIC VEHICLE DESIGN | |
| COURSE CODE: | EL326 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.AAK |

Course Outcomes:

| | |
|----------------|--|
| EL326.1 | Explain the basics of hybrid electric vehicles, their architecture, technologies, and fundamentals |
| EL326.2 | Analyse different power electronics devices and electrical machines in hybrid electric vehicles |
| EL326.3 | Explain the use of different energy storage devices used for hybrid electric vehicles, their technologies and control and select appropriate technolog |
| EL326.4 | Interpret working of different configurations of electric vehicles and its components, hybrid vehicle configuration, performance analysis and Energy Management strategies in HEVs |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | ELECTRICAL SAFETY | |
| COURSE CODE: | EL325 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

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|----------------|--|
| EL325.1 | Students will get acquainted with Electrical safety procedures |
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|------------------------|------------------------|--|-----------------|
| NAME OF COURSE: | | Solar Photovoltaic System Design & Installation | |
| COURSE CODE: | EL325 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

| | |
|----------------|---|
| EL325.1 | Students will be able to know solar photovoltaic |
| EL325.2 | Students will be able to understand components of solar PV system, types of solar photovoltaic systems. |
| EL325.3 | Students will be able to understand components of installation tool kit and safety equipment. |
| EL325.4 | Students will be able to understand installation of components. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | Mini Hardware Project | |
| COURSE CODE: | EI327 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | T.Y. B.Tech | NAME OF SUBJECT TEACHER: | Prof.MSB |

Course Outcomes:

| | |
|----------------|---|
| EI327.1 | Understand, plan and execute a mini project with team |
| EI327.2 | Device electronic hardware by implementing knowledge of PCB design techniques, soldering techniques and hardware debugging techniques |
| EI327.3 | Device electronic hardware by implementing knowledge of PCB design techniques, soldering techniques and hardware debugging techniques |
| EI327.4 | Estimate cost of the mini project, deliver technical seminar over mini project. |

Department of Electrical Engineering

SEMESTER-VII

| | | | |
|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | POWER QUALITY AND FACTS | |
| COURSE CODE: | EL411 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.SSK |

Course Outcomes:

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|----------------|--|
| EL411.1 | Student will be able to get the in-depth understanding of power quality issues & standards |
| EL411.2 | Students will be able to understand working of power quality improving Equipment's. |
| EL411.3 | Student will able to understand series compensator devices |
| EL411.4 | Student will able to understand various method of improving real and reactive power |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SIGNALS AND SYSTEMS | |
| COURSE CODE: | EL412 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.FMV |

Course Outcomes:

| | |
|----------------|--|
| EL412.1 | Identify basic signals, mathematically and graphically represent, transform and classify CT and DT signals |
| EL412.2 | Classify different systems and state their properties. |
| EL412.3 | Analyze LTI systems in the time domain using convolution and investigate their properties using Impulse response |
| EL412.4 | Use Fourier and Z Transform for analyzing systems in frequency domain and use their properties. Compute DFT and FFT of DT sequences. |



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Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SWITCHGEAR AND PROTECTION | |
| COURSE CODE: | EL413 | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.MTS |

Course Outcomes:

| | |
|----------------|---|
| EL413.1 | Students will be able to know operating principles of different relays used for protection. |
| EL413.2 | Student will be able to get the in-n-depth understanding of how the major equipment's used in the power system are being protected against faults and abnormal conditions |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-I | |
| | | High Voltage Engineering | |
| COURSE CODE: | EL415A | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

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|-----------------|--|
| EL415A.1 | Can apply Electric fields fundamentals to power system |
| EL415A.2 | Can calculate breakdown strengths of Insulators |
| EL415A.3 | Analyze the surge voltage distribution |

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-I | |
| | | Power System and Operation Control | |
| COURSE CODE: | EL415B | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

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|-----------------|--|
| EL415B.1 | Student will able to familiar with real and reactive power control |
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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-I | |
| | | Programmable Logic Control and SCADA | |
| COURSE CODE: | EL415C | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

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|-----------------|--|
| EL415C.1 | Student will able to familiar with real and reactive power control |
|-----------------|--|

Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-I Instrumentation Process Control & Robotics | |
| COURSE CODE: | EL415D | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

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|-----------------|--|
| EL415D.1 | Develop linearized mathematical models of simple systems |
| EL415D.2 | Write the input-output relationship of a P-I-D controller |
| EL415D.3 | Explain the importance of tuning of controller for a particular process |
| EL415D.4 | Distinguish between position algorithm and velocity algorithm for implementation of digital P-I-D controller |
| EL415D.5 | Find the transfer function of the feed forward controller for complete disturbance rejection |



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Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-I | |
| | | Neural Network and Fuzzy Logic Control | |
| COURSE CODE: | EL415E | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

| | |
|-----------------|---|
| EL415E.1 | Control the real time signal using Neural Networks and Fuzzy Logic. |
| EL415E.2 | Explain concepts of feed forward neural |
| EL415E.3 | Describe application of feedback networks. |
| EL415E.4 | Design the fuzzy control using genetic algorithm |



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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-I | |
| | | Extra High Voltage AC Transmission | |
| COURSE CODE: | EL415F | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.UMH |

Course Outcomes:

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|-----------------|---|
| EL415F.1 | Student will able to analyze the EHVAC system |
| EL415F.2 | Student will able to maintain/ Trouble shoot lightning arrester issues. |
| EL415F.3 | Student will able to design EHVAC Lines |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II | |
| | | Power System Planning | |
| COURSE CODE: | EL424A | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|-----------------|--|
| EL424A.1 | Explain the need of power system expansion |
| EL424A.2 | Analyze the given power system for determining optimal values of decision variables. |
| EL424A.3 | Apply mathematical tools to solve multi--objective optimization problems in expansion planning and reliability studies |
| EL424A.4 | Power System Planning and Reliability |



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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II | |
| | | Smart Grid Technology | |
| COURSE CODE: | EL424B | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|-----------------|---|
| EL424B.1 | Understand the concept of Smart Grid |
| EL424B.2 | Understand working of main components involved in Smart Electric Grid |
| EL424B.3 | Analyze how electricity problem can be solved by Smart Electric Grid technology |
| EL424B.4 | Observe and find solution on power quality issues on Smart Electric Grid |



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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II | |
| | | Special Purpose Machines and its control | |
| COURSE CODE: | EL424C | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|---------------|---|
| EL424C | Understand the concept of Smart Grid |
| EL424C | Understand working of main components involved in Smart Electric Grid |
| EL424C | Analyze how electricity problem can be solved by Smart Electric Grid technology |
| EL424C | Observe and find solution on power quality issues on Smart Electric Grid |



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Department of Electrical Engineering

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II Advance Electrical Drives | |
| COURSE CODE: | EL424D | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|-----------------|---|
| EL424D.1 | Technical expertise of electrical machines & drives |
| EL424D.2 | Apply the knowledge to practical industrial systems |
| EL424D.3 | Self-learning new technology of electrical drives |
| EL424D.4 | Analyze and solve numerical problems on electrical drives |
| EL424D.5 | Describe the modern electric machines, drives, power converters, and control circuits for Specific application. |



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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II | |
| | | Advanced Applications in Solar Energy Technology | |
| COURSE CODE: | EL424E | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II | |
| | | Electric and Hybrid Vehicle | |
| COURSE CODE: | EL424F | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|-----------------|---|
| EL424F.1 | Analyze the Life Cycle Assessment of Li-ion battery. |
| EL424F.2 | Describe the different types of Li-ion charging methods |
| EL424F.3 | Comprehend the knowledge of drive train hybridization. |
| EL424F.4 | Evaluate EV motor sizing. |
| EL424F.5 | Classify Battery Recycling methods. |

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SEMESTER VIII

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II | |
| | | Electric and Hybrid Vehicle | |
| COURSE CODE: | EL424A | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RPL |

Course Outcomes:

| | |
|-----------------|---|
| EL424A.1 | Student able to learn the testing and maintenance of various electrical equipment's |
| EL424A.2 | Student should take due care in the installation of electrical equipment's |
| EL424A.3 | Student should take due care while observing IE rules. |
| EL424A.4 | To make student can perform various test. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SELF-LEARNING MODULE--III | |
| | | Mechatronics | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

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| .1 | |
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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | PROFESSIONAL ELECTIVE-II Electric and Hybrid Vehicle | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

| | |
|-----------|--|
| .1 | Analyze the performance of solar thermal and photovoltaic systems |
| .2 | Determine wind turbine performance |
| .3 | . Explain and evaluate biomass resources in an Indian context |
| .4 | Illustrate the importance of storage systems. 5. Analyze the economics of renewable energy sources |



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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SELF-LEARNING MODULE--III | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

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|------------------------|------------------------|---|-----------------|
| NAME OF COURSE: | | SELF-LEARNING MODULE--IV | |
| | | Electrical Energy Audit and Management | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

| | |
|-----------|--|
| .1 | Analyze and understand energy consumption patterns and environmental impacts and mitigation method |
| .2 | Listing various energy conservation measures for various processes |
| .3 | Students can carry out preliminary audits. |

Department of Electrical Engineering

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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SELF-LEARNING MODULE--IV | |
| | | High Voltage DC Transmission | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

| | |
|-----------|--|
| .1 | Compare EHV AC and HVDC system and to describe various types of DC links |
| .2 | Analyze Graetz circuit for rectifier and inverter mode of operation |
| .3 | Describe various methods for the control of HVDC systems and to perform power flow analysis in AC/DC systems and to perform power flow analysis in AC/DC systems |
| .4 | Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters |



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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SELF-LEARNING MODULE—IV | |
| | | Illumination Engineering | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

| | |
|-----------|---|
| .1 | Define and reproduce various terms in illumination |
| .2 | Identify various parameters for illumination system design. |
| .3 | Design indoor and outdoor lighting systems. |
| .4 | Enlist state of the art illumination systems. |



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|------------------------|------------------------|-------------------------------------|-----------------|
| NAME OF COURSE: | | SELF-LEARNING MODULE--IV | |
| COURSE CODE: | | ACADEMIC YEAR : | 2023-24 |
| CLASS : | B.E. B.Tech | NAME OF SUBJECT TEACHER: | Prof.RDC |

Course Outcomes:

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| .1 | |
|-----------|--|