| Program : Artificial Intelligence and Data Science |
|---|

| First Year : Semester - I |
|---|

| Course Code: FEC101 | Course Name: Engineering Mathematics-I |
|---|---|

| FEC101.1 | Illustrate the basic concepts of Complex numbers. |
|---|---|
| FEC101.2 | Apply the knowledge of complex numbers to solve problems in hyperbolic functions and logarithmic function. |
| FEC101.3 | Illustrate the basic principles of Partial differentiation. |
| FEC101.4 | Illustrate the knowledge of Maxima, Minima and Successive differentiation. |
| FEC101.5 | Apply principles of basic operations of matrices, rank and echelon form of matrices to solve simultaneous equations. |
| FEC101.6 | Illustrate SCILAB programming techniques to the solution of linear and simultaneous algebraic equations. |

| Course Code: FEC102 | Course Name: Engineering Physics-I |
|---|---|

| FEC102.1 | Illustrate the fundamentals of quantum mechanics and its application. |
|---|---|
| FEC102.2 | Explain peculiar properties of crystal structure and apply them in crystallography using X-ray diffraction techniques. |
| FEC102.3 | Comprehend the concepts of semiconductor physics and applications of semiconductors in electronic devices. |
| FEC102.4 | Employ the concept of interference in thin films in measurements. |
| FEC102.5 | Discuss the properties of Superconductors and Supercapacitors to apply them in novel applications. |
| FEC102.6 | Compare the properties of engineering materials for their current and futuristic frontier application. |

| Course Code: FEC103 | Course Name: Engineering Chemistry-I |
|---|---|

| FEC103.1 | Explain the concept of microscopic chemistry in terms of atomic and molecular orbital theory and relate it to diatomic molecules. |
|---|---|
| FEC103.2 | Describe the concept of aromaticity and interpret it with relation to specific aromatic systems. |
| FEC103.3 | Illustrate the knowledge of various types of intermolecular forces and relate it to real gases. |
| FEC103.4 | Interpret various phase transformations using thermodynamics. |
| FEC103.5 | Illustrate the knowledge of polymers, fabrication methods, conducting polymers in various industrial fields. |
| FEC103.6 | Analyze the quality of water and suggest suitable methods of treatment. |

| Program : Artificial Intelligence and Data Science |
|---|

| First Year : Semester - I |
|---|

| Course Code: FEC104 | Course Name: Engineering Mechanics |
|---|---|
| FEC104.1 | Explain the concept of microscopic chemistry in terms of atomic and molecular orbital theory and relate it to diatomic molecules. |
| FEC104.2 | Describe the concept of aromaticity and interpret it with relation to specific aromatic systems. |
| FEC104.3 | Illustrate the knowledge of various types of intermolecular forces and relate it to real gasses. |
| FEC104.4 | Interpret various phase transformations using thermodynamics. |
| FEC104.5 | Illustrate the knowledge of polymers, fabrication methods, conducting polymers in various industrial fields. |
| FEC104.6 | Analyze the quality of water and suggest suitable methods of treatment. |

| Course Code: FEC105 | Course Name: Basic Electrical Engineering |
|---|---|
| FEC105.1 | Apply various network theorems to determine the circuit response / behavior. |
| FEC105.2 | Evaluate and analyze 1-$\Phi$ circuits. |
| FEC105.3 | Evaluate and analyze 3-$\Phi$ AC circuits. |
| FEC105.4 | Understand the constructional features and operation of 1-$\Phi$ transformer. |
| FEC105.5 | Illustrate the working principle of 3-$\Phi$ machine. |
| FEC105.6 | Illustrate the working principle of 1-$\Phi$ machines. |

| Course Code: FEL101 | Course Name: Engineering Physics-I Lab |
|---|---|
| FEL101.1 | Perform the experiments based on interference in thin films and analyze the results. |
| FEL101.2 | Verify the theory learned in the module crystallography. |
| FEL101.3 | Perform the experiments on various semiconductor devices and analyze their characteristics. |
| FEL101.4 | Perform simulation study on engineering materials. |

| Course Code: FEL102 | Course Name: Engineering Chemistry-I Lab |
|---|---|
| FEL102.1 | Determine Chloride content and hardness of water sample. |
| FEL102.2 | Determine free acid ph of different solutions. |
| FEL102.3 | Determine metal ion concentration. |
| FEL102.4 | Synthesize polymers, biodegradable plastics. |
| FEL102.5 | Determine Viscosity of oil. |

| Program : Artificial Intelligence and Data Science |
|---|

| First Year : Semester - I |
|---|

| Course Code: FEL103 | Course Name: Engineering Mechanics Lab |
|---|---|
| FEL103.1 | Verify equations of equilibrium of coplanar force system. |
| FEL103.2 | Verify law of moments. |
| FEL103.3 | Determine the centroid of plane lamina. |
| FEL103.4 | Evaluate co-efficient of friction between the different surfaces in contact. |
| FEL103.5 | Demonstrate the types of collision/impact and determine corresponding coefficient of restitution. |
| FEL103.6 | Differentiate the kinematics and kinetics of a particle. |

| Course Code: FEL104 | Course Name: Basic Electrical Engineering Lab |
|---|---|
| FEL104.1 | Interpret and analyse the behaviour of DC circuits using network theorems. |
| FEL104.2 | Perform and infer experiment on single phase AC circuits. |
| FEL104.3 | Demonstrate experiment on three phase AC circuits. |
| FEL104.4 | Illustrate the performance of single-phase transformer and machines. |

| Course Code: FEL105 | Course Name: Basic Workshop Practice-I |
|---|---|
| FEL105.1 | Develop the necessary skill required to handle/use different fitting tools. |
| FEL105.2 | Develop skill required for hardware maintenance. |
| FEL105.3 | Able to install an operating system and system drives. |
| FEL105.4 | Able to identify the network components and perform basic networking and crimping. |
| FEL105.5 | Able to prepare the edges of jobs and do simple arc welding. |
| FEL105.6 | Develop the necessary skill required to handle/use different plumping tools. |
| FEL105.7 | Demonstrate the turning operation with the help of a simple job. |

| Program : Artificial Intelligence and Data Science |
|---|
| **First Year : Semester - II** |

| Course Code: FEC201 | Course Name: Engineering Mathematics-II |
|---|---|
| FEC201.1 | Solve various types of First Order differential equations. |
| FEC201.2 | Solve various types of Higher Order Differential equations. |
| FEC201.3 | Illustrate the concepts of Beta and Gamma function, DUIS and rectification. |
| FEC201.4 | Apply the concepts of Double integral. |
| FEC201.5 | Apply the concept of Triple integral. |
| FEC201.6 | Apply the principles of Numerical Method for solving differential equation and numerical integration analytically and using Scilab also. |

| Course Code: FEC202 | Course Name: Engineering Physics-II |
|---|---|
| FEC202.1 | Describe the diffraction through slits and its applications. |
| FEC202.2 | Apply the foundation of laser and fiber optics in development of modern communication technology. |
| FEC202.3 | Relate the basics of electrodynamics which is prerequisite for satellite communications, antenna theory etc. |
| FEC202.4 | Explain the fundamentals of relativity. |
| FEC202.5 | Assimilate the wide scope of nanotechnology in modern developments and its role in emerging innovative applications. |
| FEC202.6 | Interpret and explore basic sensing techniques for physical measurements in modern instrumentations. |

| Course Code: FEC203 | Course Name: Engineering Chemistry-II |
|---|---|
| FEC203.1 | Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. |
| FEC203.2 | Illustrate the concept of emission spectroscopy and describe the phenomena of fluorescence and phosphorescence in relation to it. |
| FEC203.3 | Explain the concept of electrode potential and nernst theory and relate it to electrochemical cells. |
| FEC203.4 | Identify different types of corrosion and suggest control measures in industries. |
| FEC203.5 | Illustrate the principles of green chemistry and study environmental impact. |
| FEC203.6 | Explain the knowledge of determining the quality of fuel and quantify the oxygen required for combustion of fuel. |

| Program : Artificial Intelligence and Data Science |
|---|

| First Year : Semester - II |
|---|

| Course Code: FEC204 | Course Name: Engineering Graphics |
|---|---|

| FEC204.1 | Apply the basic principles of projections in Projection of Lines and Planes. |
|---|---|
| FEC204.2 | Apply the basic principles of projections in Projection of Solids. |
| FEC204.3 | Apply the basic principles of sectional views in Section of solids. |
| FEC204.4 | Apply the basic principles of projections in converting 3D view to 2D drawing. |
| FEC204.5 | Read a given drawing. |
| FEC204.6 | Visualize an object from the given two views. |

| Course Code: FEC205 | Course Name: C - Programming |
|---|---|

| FEC205.1 | Formulate simple algorithms for arithmetic, logical problems and translate them to programs in C language. |
|---|---|
| FEC205.2 | Implement, test and execute programs comprising of control structures. |
| FEC205.3 | Decompose a problem into functions and synthesize a complete program. |
| FEC205.4 | Demonstrate the use of arrays, strings and structures in C language. |
| FEC205.5 | Understand the concept of pointers. |

| Course Code: FEC206 | Course Name: Professional Communication and Ethics- I |
|---|---|

| FEC206.1 | Eliminate barriers and use verbal/non-verbal cues at social and workplace situations. |
|---|---|
| FEC206.2 | Employ listening strategies to comprehend wide-ranging vocabulary, grammatical structures, tone and pronunciation. |
| FEC206.3 | Prepare effectively for speaking at social, academic and business situations. |
| FEC206.4 | Use reading strategies for faster comprehension, summarization and evaluation of texts. |
| FEC206.5 | Acquire effective writing skills for drafting academic, business and technical documents. |
| FEC206.6 | Successfully interact in all kinds of settings, displaying refined grooming and social skills. |

| Program : Artificial Intelligence and Data Science |
|---|

| First Year : Semester - II |
|---|

| Course Code: FEL201 | Course Name: Engineering Physics-II |
|---|---|
| FEL201.1 | Perform the experiments based on diffraction through slits using Laser source and analyze the results. |
| FEL201.2 | Perform the experiments using optical fibre to measure numerical aperture of a given fibre. |
| FEL201.3 | Perform the experiments on various sensors and analyze the result. |

| Course Code: FEL202 | Course Name: Engineering Chemistry-II |
|---|---|
| FEL202.1 | Determine moisture and ash content of coal. |
| FEL202.2 | Analyze flue gas. |
| FEL202.3 | Determine saponification and acid value of oil. |
| FEL202.4 | Determine flash point of a lubricating oil. |
| FEL202.5 | Synthesize a drug and a biofuel. |
| FEL202.6 | Determine na/k and emf of cu-zn system. |

| Course Code: FEL203 | Course Name: Engineering Graphics |
|---|---|
| FEL203.1 | Apply the basic principles of projections in 2D drawings using a CAD software. |
| FEL203.2 | Create, Annotate, Edit and Plot drawings using basic AutoCAD commands and features. |
| FEL203.3 | Apply the concepts of layers to create drawing. |
| FEL203.4 | Apply basic AutoCAD skills to draw different views of a 3D object. |
| FEL203.5 | Apply basic AutoCAD skills to draw the isometric view from the given two views. |

| Course Code: FEL204 | Course Name: C programming |
|---|---|
| FEL204.1 | Translate given algorithms to a program. |
| FEL204.2 | Correct syntax and logical errors. |
| FEL204.3 | Write iterative as well as recursive programs. |
| FEL204.4 | Represent data in arrays, strings and structures and manipulate them through a program. |
| FEL204.5 | Declare pointers and demonstrate call by reference concept. |

| Program : Artificial Intelligence and Data Science | |
|---|---|
| **First Year : Semester - II** | |

| Course Code: FEL205 | Course Name: Professional Communication and Ethics- I |
|---|---|
| FEL205.1 | Listen and comprehend all types of spoken discourse successfully. |
| FEL205.2 | Speak fluently and make effective professional presentations. |
| FEL205.3 | Read large quantities of text in a short time to comprehend, summarise and evaluate content. |
| FEL205.4 | Draft precise business letters, academic essays and technical guidelines. |
| FEL205.5 | Dress finely and conduct themselves with panache in social, academic and professional situations. |

| Course Code: FEL206 | Course Name: Basic Workshop Practice-II |
|---|---|
| FEL206.1 | Develop the necessary skill required to handle/use different carpentry tools. |
| FEL206.2 | Identify and understand the safe practices to adopt in electrical environment. |
| FEL206.3 | Demonstrate the wiring practices for the connection of simple electrical load/ equipment. |
| FEL206.4 | Design, fabricate and assemble pcb. |
| FEL206.5 | Develop the necessary skill required to handle/use different masons tools. |
| FEL206.6 | Develop the necessary skill required to use different sheet metal and brazing tools. |
| FEL206.7 | Able to demonstrate the operation, forging with the help of a simple job. |