

Revised Structure B. Tech 1st Year
**DR. A.P.J. ABDUL KALAM TECHNICAL
UNIVERSITY, UTTAR PRADESH, LUCKNOW**



**REVISED EVALUATION SCHEME
&
SYLLABUS**

**FOR
B. TECH. I YEAR**

(Biotechnology (BT))

**ON
AICTE MODEL CURRICULUM)
[Effective from the Session: 2020-21]**

Revised Structure B. Tech 1st Year

B.Tech. II Semester (Biotechnology)

| S. No. | Course Code | Course Title | Periods | | | Evaluation Scheme | | | | End Semester | | Total | Credits |
|--------|---------------------|---|---------|---|---|-------------------|----|-------|----|--------------|----|-------|---------|
| | | | L | T | P | CT | TA | Total | PS | TE | PE | | |
| 1 | KAS202T | Engineering Chemistry | 3 | 1 | 0 | 30 | 20 | 50 | | 100 | | 150 | 4 |
| 2 | KBT201T/ KBT202T | Elementary Mathematics –II Remedial Biology-II | 3 | 1 | 0 | 30 | 20 | 50 | | 100 | | 150 | 4 |
| 3 | KEC201T | Emerging Domain in Electronics Engineering | 3 | 0 | 0 | 30 | 20 | 50 | | 100 | | 150 | 3 |
| 4 | KME201T | Fundamentals of Mechanical Engineering & Mechatronics | 3 | 0 | 0 | 30 | 20 | 50 | | 100 | | 150 | 3 |
| 5 | KAS252P | Engineering Chemistry Lab | 0 | 0 | 2 | | | | 25 | | 25 | 50 | 1 |
| 6 | KEC251P | Electronics Engineering Lab | 0 | 0 | 2 | | | | 25 | | 25 | 50 | 1 |
| 7 | KAS254P | English Language Lab | 0 | 1 | 2 | | | | 25 | | 25 | 50 | 1 |
| 8 | KCE251P/ KWS251P | Engineering Graphics & Design Lab/ Mechanical Workshop Lab | 0 | 1 | 2 | | | | 50 | | 50 | 100 | 1 |
| 9 | KMC202 | Emerging Technology for Engineering | 2 | 0 | 0 | 15 | 10 | 25 | | 25 | | 50 | 2 |
| 10 | KNC201 | Soft Skill II | 2 | 0 | 0 | 15 | 10 | 25 | | 25 | | | NC |
| | MOOCs | (For B.Tech. Hons. Degree)* | | | | | | | | | | | |
| | | Total | | | | | | | | | | 900 | 20 |

Mini Project or Internship (3-4 weeks) shall be conducted during summer break after II semester and will be assessed during III semester

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|------------------------------------|-------------------------------|-----------------|------------------|
| KEE-101T KEE-201T | ELECTRICAL ENGINEERING | 3L:0T:0P | 3 Credits |
|------------------------------------|-------------------------------|-----------------|------------------|

| Unit | Topics | Lectures |
|------|---|----------|
| I | DC Circuits : Electrical circuit elements (R, L and C), Concept of active and passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements, Kirchhoff's laws, Loop and nodal methods of analysis, Star-delta transformation, Superposition theorem, Thevenin theorem, Norton theorem. | 8 |
| II | Steady- State Analysis of Single Phase AC Circuits: Representation of Sinusoidal waveforms – Average and effective values, Form and peak factors, Concept of phasors, phasor representation of sinusoidal varying voltage and current. Analysis of single phase AC Circuits consisting of R, L, C, RL, RC, RLC combinations (Series and Parallel), Apparent, active & reactive power, Power factor, power factor improvement. Concept of Resonance in series & parallel circuits, bandwidth and quality factor. Three phase balanced circuits, voltage and current relations in star and delta connections. | 8 |
| III | Transformers: Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections. | 8 |
| IV | Electrical machines: DC machines: Principle & Construction, Types, EMF equation of generator and torque equation of motor, applications of DC motors (simple numerical problems) Three Phase Induction Motor: Principle & Construction, Types, Slip-torque characteristics, Applications (Numerical problems related to slip only) Single Phase Induction motor: Principle of operation and introduction to methods of starting, applications. Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor and their applications. | 8 |
| V | Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Importance of earthing. Types of Batteries, Important characteristics for Batteries. Elementary calculations for energy consumption and savings, battery backup. | 8 |

Text Book:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", McGraw Hill.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill.
3. Ritu Sahdev, "Basic Electrical Engineering", Khanna Publishing House.
4. S. Singh, P.V. Prasad, "Electrical Engineering: Concepts and Applications" Cengage

Reference Books:

1. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
2. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press.
3. V. D. Toro, "Electrical Engineering Fundamentals", Pearson India.

Spoken Tutorial (MOOCs): Open Source Spice circuit Simulator Software

1. AC DC Circuit Analysis using NgSpice, Open Source Spice circuit Simulator Software (<http://spoken-tutorial.org>)

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Course Outcomes: At the end of this course students will demonstrate the ability to:

1. Apply the concepts of KVL/KCL and network theorems in solving DC circuits.
2. Analyze the steady state behavior of single phase and three phase AC electrical circuits.
3. Identify the application areas of a single phase two winding transformer as well as an auto transformer and calculate their efficiency. Also identify the connections of a three phase transformer.
4. Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications.
5. Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption.

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|-----------------|---------------------------------------|-----------------|------------------|
| KEC-101T | EMERGING DOMAIN IN ELECTRONICS | 3L:0T:0P | 3 Credits |
| KEC-201T | ENGINEERING | | |

| Unit | Topics | Lectures |
|------|---|----------|
| I | Semiconductor Diode: Depletion layer, V-I characteristics, ideal and practical Diodes, Diode Equivalent Circuits, Zener Diodes breakdown mechanism (Zener and avalanche) | 3 |
| | Diode Application: Diode Configuration, Half and Full Wave rectification, Clippers, Clampers, Zener diode as shunt regulator, Voltage-Multiplier Circuits | 3 |
| | Special Purpose two terminal Devices: Light-Emitting Diodes, Photo Diodes, Varactor Diodes, Tunnel Diodes, Liquid-Crystal Displays. | 2 |
| II | Bipolar Junction Transistor: Transistor Construction, Operation, Amplification action. Common Base, Common Emitter, Common Collector Configuration | 4 |
| | Field Effect Transistor: Construction and Characteristic of JFETs. Transfer Characteristic. MOSFET (MOS) (Depletion and Enhancement) Type, Transfer Characteristic. | 4 |
| III | Operational Amplifiers: Introduction, Op-Amp Basic, Practical Op-Amp Circuits (Inverting Amplifier, Non-inverting Amplifier, Unit Follower, Summing Amplifier, Integrator, Differentiator). Differential and Common-Mode Operation, Comparators. | 4 |
| | Introduction of IoT System, Components of IoT system: Microprocessor and Microcontroller, Bluetooth Technology, Wi-Fi Technology, Concept of Networking, Sensor Nodes, concept of cloud. | 4 |
| IV | Digital Electronics: Number system & representation. Introduction of Basic and Universal Gates, using Boolean algebra simplification of Boolean function. K Map Minimization upto 6 Variable. | 6 |
| | Introduction To IC Technology: SSI, MSI, LSI, VLSI Integrated Circuits. | 2 |
| V | Fundamentals of Communication Engineering: Basics of signal representation and analysis, Electromagnetic spectrum Elements of a Communication System, Need of modulation and typical applications, Fundamentals of amplitude modulation and demodulation techniques. | 4 |
| | Introduction to Data Communications: Goals and applications of Networks. General Model of Wireless Communication: Evolution of mobile radio communication fundamentals, GPRS, GSM, CDMA. Elements of Satellite & Radar Communication, | 4 |

Text Books:

1. Robert L. Boylestand / Louis Nashelsky “Electronic Devices and Circuit Theory”, Pearson Education.
2. H S Kalsi, “Electronic Instrumentation”, McGraw Publication
3. George Kennedy, “Electronic Communication Systems”, McGraw Publication
4. David A. Bell, “Electronic Devices and Circuits”, Oxford University Press.
5. Jacob Millman, C.C. Halkias, Staya brataJit, “Electronic Devices and Circuits”, McGraw Hill
6. David A. Bell, Electronic Instrumentation and Measurements, Latest Edition, Oxford University Press India

Course Outcomes: At the end of this course students will demonstrate the ability to:

1. Understand the concept of PN Junction and devices.
2. Understand the concept of BJT, FET and MOFET.
3. Understand the concept of Operational amplifier
4. Understand the concept of measurement instrument.
5. Understand the working principle of different type of sensor and their uses.
6. Understand the concept of IoT system & Understand the component of IoT system

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|-----------------|--|-----------------|------------------|
| KCS-101T | PROGRAMMING FOR PROBLEM SOLVING | 3L:0T:0P | 3 Credits |
| KCS-201T | | | |

| Unit | Topics | Lectures |
|------|---|----------|
| I | <p>Introduction to Programming: Introduction to components of a computer system: Memory, processor, I/O Devices, storage, operating system, Concept of assembler, compiler, interpreter, loader and linker.</p> <p>Idea of Algorithm: Representation of Algorithm, Flowchart, Pseudo code with examples, From algorithms to programs, source code.</p> <p>Programming Basics: Structure of C program: writing and executing the first C program, Syntax and logical errors in compilation, object and executable code. Components of C language: Standard I/O in C, Fundamental data types, Variables and memory locations, Storage classes.</p> | 8 |
| II | <p>Arithmetic expressions & Conditional Branching: Arithmetic expressions and precedence: Operators and expression using numeric and relational operators, mixed operands, type conversion, logical operators, bit operations, assignment operator, operator precedence and associativity.</p> <p>Conditional Branching: Applying if and switch statements, nesting if and else, use of break and default with switch.</p> | 8 |
| III | <p>Loops & Functions: Iteration and loops: use of while, do while and for loops, multiple loop variables, use of break and continue statements.</p> <p>Functions: Introduction, types of functions, functions with array, passing parameters to functions, call by value, call by reference, recursive functions.</p> | 8 |
| IV | <p>Arrays & Basic Algorithms: Arrays: Array notation and representation, manipulating array elements, using multi dimensional arrays. Character arrays and strings, Structure, union, enumerated data types, Array of structures, Passing arrays to functions.</p> <p>Basic Algorithms: Searching & Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, Notion of order of complexity.</p> | 8 |
| V | <p>Pointer & File Handling: Pointers: Introduction, declaration, applications, Introduction to dynamic memory allocation (malloc, calloc, realloc, free), Use of pointers in self-referential structures, notion of linked list (no implementation)</p> <p>File handling: File I/O functions, Standard C preprocessors, defining and calling macros, command-line arguments.</p> | 8 |

Text Books:

1. Schum's Outline of Programming with C by Byron Gottfried, McGraw-Hill
2. The C programming by Kernighan Brain W. and Ritchie Dennis M., Pearson Education.
3. Computer Basics and C Programming by V.Rajaraman , PHI Learning Pvt. Limited, 2015.
4. Computer Concepts and Programming in C, R.S. Salaria, Khanna Publishing House
5. Computer Concepts and Programming in C, E Balaguruswami, McGraw Hill
6. Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition , Cengage Learning - 2007.

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7. Let Us C By Yashwant P. Kanetkar.
 8. Problem Solving and Program Design in C, by Jeri R. Hanly, Elliot B. Koffman, Pearson Addison-Wesley, 2006.
 9. Programming in C by Kochan Stephen G. Pearson Education – 2015.
 10. Computer Concepts and Programming in C by D.S. Yadav and Rajeev Khanna, New Age International Publication.
 11. Computer Concepts and Programming by Anami, Angadi and Manvi, PHI Publication.
 12. Computer Concepts and Programming in C by Vikas Gupta, Wiley India Publication
 13. Computer Fundamentals and Programming in C. Reema Thareja, Oxford Publication
 14. Problem Solving and Programming in C, R.S. Salaria, Khanna Publishing House.

Course Outcomes: At the end of this course students will be able to:

1. To develop simple algorithms for arithmetic and logical problems.
2. To translate the algorithms to programs & execution (in C language).
3. To implement conditional branching, iteration and recursion.
4. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
5. To use arrays, pointers and structures to develop algorithms and programs.

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|-----------------|---|-----------------|------------------|
| KME-101T | FUNDAMENTAL OF MECHANICAL ENGINEERING AND MECHATRONICS | 3L:0T:0P | 3 Credits |
| KME-201T | | | |

| Unit | Topics | Lectures |
|------|--|----------|
| I | <p>Unit I: Introduction to Mechanics of Solid: Normal and shear Stress, strain, Hookes' law, Poisson's ratio, elastic constants and their relationship, stress-strain diagram for ductile and brittle materials, factor of safety. Basic Numerical problems. Types of beams under various loads, Statically Determinate Beams, Shear force and bending moment in beams, Shear force and bending moment diagrams, Relationships between load, shear and bending moment. Basic Numerical problems.</p> | 8 |
| II | <p>Introduction to IC Engines and RAC: IC Engine: Basic Components, Construction and Working of Two stroke and four stroke SI & CI engine, merits and demerits, scavenging process; Introduction to electric, and hybrid electric vehicles. Refrigeration: Its meaning and application, unit of refrigeration; Coefficient of performance, methods of refrigeration, construction and working of domestic refrigerator, concept of heat pump. Formula based numerical problems on cooling load. Air-Conditioning: Its meaning and application, humidity, dry bulb, wet bulb, and dew point temperatures, comfort conditions, construction and working of window air conditioner.</p> | 10 |
| III | <p>Introduction to Fluid Mechanics and Applications: Introduction: Introduction: Fluids properties, pressure, density, dynamic and kinematic viscosity, specific gravity, Newtonian and Non-Newtonian fluid, Pascal's Law, Continuity Equation, Bernaulli's Equation and its applications, Basic Numerical problems. Working principles of hydraulic turbines & pumps and their classifications, hydraulic accumulators, hydraulic lift and their applications.</p> | 7 |
| IV | <p>Measurements and Control System: Concept of Measurement, Error in measurements, Calibration, measurements of pressure, temperature, mass flow rate, strain, force and torques; Concept of accuracy, precision and resolution, Basic Numerical problems. System of Geometric Limit, Fit, Tolerance and gauges, Basic Numerical problems. Control System Concepts: Introduction to Control Systems, Elements of control system, Basic of open and closed loop control with example.</p> | 8 |
| V | <p>Introduction to Mechatronics: Evolution, Scope, Advantages and disadvantages of Mechatronics, Industrial applications of Mechatronics, Introduction to autotronics, bionics, and avionics and their applications. Sensors and Transducers: Types of sensors, types of transducers and their characteristics. Overview of Mechanical Actuation System – Kinematic Chains, Cam, Train Ratchet Mechanism, Gears and its type, Belt, Bearing, Hydraulic and Pneumatic Actuation Systems: Overview: Pressure Control Valves, Cylinders, Direction Control Valves, Rotary Actuators, Accumulators, Amplifiers, and Pneumatic Sequencing Problems.</p> | 10 |

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Reference Books:

1. Basic Mechanical Engineering, G Shanmugam, S Ravindran, McGraw Hill
2. Basic Mechanical Engineering, M P Poonia and S C Sharma, Khanna Publishers
3. Mechatronics: Principles, Concepts and Applications, Nitaigour Mahalik, McGraw Hill
4. Mechatronics, As per AICTE: Integrated Mechanical Electronic Systems, K.P. Ramachandran, G.K. Vijayaraghavan, M.S.Balasundaram, Wiley India
5. Mechanical Measurements & Control, Dr. D. S. Kumar. Metropolitan Book Company
6. Fluid Mechanics and Hydraulic Machines, Mahesh Kumar, Pearson India

| The students will be able to | | Blooms Taxonomy |
|------------------------------|---|-----------------|
| CO1 | Understand the concept of stress and strain, factor of safety, beams | K2 |
| CO2 | Understand the basic component and working of internal combustion engines, electric and hybrid vehicles, refrigerator and heat pump, air-conditioning. | K2 |
| CO3 | Understand fluid properties, conservation laws, hydraulic machinery used in real life. | K2 |
| CO4 | Understand the working principle of different measuring instrument with the knowledge of accuracy, error and calibration, limit, fit, tolerance and control system. | K2 |
| CO5 | Understand concept of mechatronics with their advantages, scope and Industrial application, the different types of mechanical actuation system, the different types of hydraulic and pneumatic systems. | K2 |
| CO6 | Apply concepts of strength of material for safe design, refrigeration for calculation of COP, concepts of fluid mechanics in real life, concepts of measurements in production systems. | K3 |

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|-----------------|--|-----------------|------------------|
| KCE-151P | ENGINEERING GRAPHICS AND DESIGN LAB | 0L:1T:2P | 1 Credits |
| KCE-151P | | | |

| Unit | Topics | Lectures |
|------|---|----------|
| I | Introduction to Engineering Drawing, Orthographic Projections: Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Scales –Plain and Diagonal Scales. Principles of Orthographic Projections – Conventions – Projections of Points and Lines inclined to both planes; Projections of planes inclined Planes – Auxiliary Planes | 8 |
| II | Projections and Sections of Regular Solids: Sections in lined to both the Planes – Auxiliary Views; Simple annotation, dimensioning and scale. Floor plans the include: windows, doors and fixtures such as WC, Bath, sink, shower, etc. Prism, Cylinder, Pyramid, Cone–Auxiliary Views: Development of surfaces of Right Regular Solids – Prism, Pyramid, Cylinder and Cone. | 8 |
| III | Isometric Projections: Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conversions. | 8 |
| IV | <p>Computer Graphics: Listing the computer technologies the impact on graphical communication, Demonstration knowledge of the theory of CAD software [such as: The Menu System, Tollbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects: Isometric Views of lines, Planes, Simple and compound Solids];</p> <p>Set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerancing; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles:</p> <p>Applying dimensions to objects, applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command: orthographic projection techniques; Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface; Drawing annotation, Computer-aided design (CAD) software modelling of parts and assemblies. Parametric and non-parametric solid, surface, and wireframe models. Part editing and two-dimensional documentation of models. Planar projection theory, including sketching of perspective, isometric, Multiview, auxiliary, and section views. Spatial visualization exercises Dimensioning guidelines, tolerancing techniques; dimensioning and scale multi views of dwelling.</p> | 8 |
| V | Demonstration of a simple team design project: Geometry and topology of engineered components: creation of engineering models and their presentation in standard 2D blueprint form and as 3D wire-frame and shaded solids; meshed topologies for engineering analysis and tool-path generation for component manufacture; geometric dimensioning and tolerancing; Use of solid-modelling software for creating associative models at the component and assembly levels; floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc. Applying colour coding according to building drawing practice; Drawing sectional elevation showing foundation to ceiling; Introduction to Building Information Modelling (BIM). | 8 |

Text Books:

1. Bhatt N.D., Panchal V.M. & Ingle P.R. (2014), Engineering Drawing, Charotar Publishing House.
2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
3. Agrawal B. & Agrawal C.M. (2012), Engineering Graphics, McGraw Publication
4. Engineering Graphics & Design, A.P. Gautam & Pradeep Jain, Khanna Publishing House
5. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers. (Corresponding set of) CAD Software Theory and User Manuals.

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Course Outcomes: At the end of this course students will demonstrate the ability to:

1. Understanding of the visual aspects of engineering design
2. Understanding of engineering graphics standards and solid modelling
3. Effective communication through graphics
4. Applying modern engineering tools necessary for engineering practice
5. Applying computer-aided geometric design
6. Analysis of Isometric views
7. Creating working drawings

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| KWS-151P | MECHANICAL WORKSHOP LAB | 0L:1T:2P | 1 Credit |
| KWS-251P | | | |

SUGGESTIVE LIST OF EXPERIMENTS:

| The students will be able to | | Blooms Taxonomy |
|------------------------------|---|-----------------|
| CO1 | Use various engineering materials, tools, machines and measuring equipments. | K3 |
| CO2 | Perform machine operations in lathe and CNC machine. | K3 |
| CO3 | Perform manufacturing operations on components in fitting and carpentry shop. | K3 |
| CO4 | Perform operations in welding, moulding, casting and gas cutting. | K3 |
| CO5 | Fabricate a job by 3D printing manufacturing technique | K3 |

| S. No. | Mechanical Workshop | Duration |
|----------|---|----------------|
| 1 | Introduction to Mechanical workshop material, tools and machines | |
| | To study layout, safety measures and different engineering materials (mild steel, medium carbon steel, high carbon steel, high speed steel and cast iron etc) used in workshop. | 3 Hours |
| | To study and use of different types of tools, equipments, devices & machines used in fitting, sheet metal and welding section. | |
| | To determine the least count of vernier caliper, vernier height gauge, micrometer (Screw gauge) and take different reading over given metallic pieces using these instruments. | |
| 2 | Machine shop | |
| | Demonstration of working, construction and accessories for Lathe machine | 3 Hours |
| | Perform operations on Lathe - Facing, Plane Turning, step turning, taper turning, threading, knurling and parting. | |
| 3 | Fitting shop | |
| | 1. Practice marking operations. 2. Preparation of U or V -Shape Male Female Work piece which contains: Filing, Sawing, Drilling, Grinding. | 3 Hours |
| 4 | Carpentry Shop | |
| | Study of Carpentry Tools, Equipment and different joints. | 3 Hours |
| | Making of Cross Half lap joint, Half lap Dovetail joint and Mortise Tenon Joint | |
| 5 | Welding Shop | |
| | Introduction to BI standards and reading of welding drawings. | |

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|----------|---|----------------|
| | Practice of Making following operations Butt Joint Lap Joint TIG Welding MIG Welding | 6 Hours |
| 6 | Moulding and Casting Shop | |
| | Introduction to Patterns, pattern allowances, ingredients of moulding sand and melting furnaces. Foundry tools and their purposes Demo of mould preparation and Aluminum casting Practice – Study and Preparation of Plastic mould | 6 Hours |
| 7 | CNC Shop | |
| | Study of main features and working parts of CNC machine and accessories that can be used. Perform different operations on metal components using any CNC machines | 6 Hours |
| 8 | To prepare a product using 3D printing | 3 Hours |

Reference Books:

1. Workshop Practice, H S Bawa, McGraw Hill
2. Mechanical Workshop Practice, K C John, PHI
3. Workshop Practice Vol 1, and Vol 2, by HazraChoudhary , Media promoters and Publications
4. CNC Fundamentals and Programming, By P. M. Agrawal, V. J. Patel, Charotar Publication.

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|----------------------|-------------|----------|----------|
| KAS-154P KAS-254P | ENGLISH LAB | 0L:1T:2P | 1 Credit |
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Course Objectives:

1. To facilitate software based learning to provide the required English Language proficiency to students.
2. To acquaint students with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking.
3. To train students to use the correct and error-free writing by being well versed in rules of English grammar.
4. To cultivate relevant technical style of communication and presentation at their work place and also for academic uses.
5. To enable students to apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.

SYLLABUS: PROFESSIONAL COMMUNICATION LAB SHALL HAVE TWO PARTS:

Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communication based on International Phonetic Alphabets (LP.A.)

LIST OF PRACTICALS

1. Group Discussion: Practical based on Accurate and Current Grammatical Patterns.
 2. Conversational Skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.
 3. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistic /Kinesics.
 4. Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics
 5. Official/Public Speaking based on suitable Rhythmic Patterns.
 6. Theme Presentation/ Keynote Presentation based on correct methodologies argumentation
 7. Individual Speech Delivery/Conferencing with skills to defend Interjections/Quizzes.
 8. Argumentative Skills/Role Play Presentation with Stress and Intonation.
 9. Comprehension Skills based on Reading and Listening Practical's on a model Audio
-
1. **Computer assisted software based Language Learning:** Software based self-guided learning to provide the required English language proficiency to students from an employability and career readiness standpoint. The software should align to Common European Framework of Reference for Languages (CEFR) and deliver a CEFR level – B2 upon completion.
 2. **Interactive Communication Skills:** Students should practice the language with variety of activities and exercises based on employability skills as startup presentations, GD, Mock interview, Video portfolio, Extempore, Role play, Just A Minute (JAM) etc.

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Suggested software:

- *Oxford Achiever* by Oxford University Press.
- *Cambridge English Empower* by Cambridge University Press.
- *MePro*. by Pearson India Education Services Pvt. Ltd.
- *New Interactions* by McGraw-Hill India.

Reference Books:

1. Word Power Made Easy by Norman Lewis, W.R. Goyal Pub. & Distributors, 2009, Delhi.
2. Manual of Practical Communication by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.
3. A Course in Phonetics and Spoken English, Sethi & Dhamija:, Prentice Hall
4. English Pronouncing Dictionary, Joans Daniel, Cambridge University Press, 2007.
5. English Grammar and Usage by R. P. Sinha, Oxford University Press, 2005, New Delhi.
6. English Grammar, Composition and Usage by N.K. Agrawal & F.T. Wood, Macmillan India Ltd., New Delhi.
7. Effective Communication Skill, Kulbhusan Kumar, RS Salaria, Khanna Publishing House
8. English Grammar & Composition by Wren & Martin, S.Chand & Co. Ltd., New Delhi.
9. Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt. Ltd, 2011, New Delhi.
10. Personality Development, Harold R. Wallace & L. Ann Masters, Cengage Learning, New Delhi
11. Personality Development & Soft Skills, Barun K. Mitra, Oxford University Press, 2012 New Delhi.
12. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, McGraw Hill & Co. Ltd., 2001, New Delhi.
13. Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.
14. Spoken English- A Manual of Speech and Phonetics by R. K. Bansal & J.B.Harrison, Orient Blackswan, 2013, New Delhi.
15. Business English by Ken Taylor, Orient Blackswan, 2011, New Delhi.

Course outcome: At the end of this course students will demonstrate the ability:

1. Students will be enabled to understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking.
2. Students would be able to create substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as Comprehension, reading, writing and speaking etc.
3. Students will apply it at their work place for writing purposes such as Presentation/official drafting/administrative communication and use it for document/project/report/research paper writing.
4. Students will be made to evaluate the correct and error-free writing by being well-versed in rules of English grammar and cultivate relevant technical style of communication & presentation at their work place and also for academic uses.
5. Students will apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics. They will apply techniques for developing interpersonal communication skills and positive attitude leading to their professional competence.

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| KCS-151P KCS-251P | PROGRAMMING FOR PROBLEM SOLVING | 0L:1T:2P | 1 Credit |
|----------------------|--|-----------------|-----------------|

| KCS151P- Programming for Problem Solving Lab | | |
|--|--|-------------------------------------|
| | Course Outcome (CO) | Bloom's Knowledge Level (KL) |
| At the end of course , the student will be able to: | | |
| CO 1 | Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems. | K ₃ , K ₄ |
| CO 2 | Demonstrate an understanding of computer programming language concepts. | K ₃ , K ₂ |
| CO 3 | Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage. | K ₆ , K ₄ |
| CO 4 | Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures. | K ₁ , K ₅ |
| CO 5 | Develop confidence for self education and ability for life-long learning needed for Computer language. | K ₃ , K ₄ |

| Lab No. | Expt. | Program |
|--------------|----------|---|
| LAB 1 | 1 | Write a program to calculate the area of triangle using formula $at=\sqrt{s(s-a)(s-b)(s-c)}$ |
| | 2 | Basic salary of an employee is input through the keyboard. The DA is 25% of the basic salary while the HRA is 15% of the basic salary. Provident Fund is deducted at the rate of 10% of the gross salary (BS+DA+HRA). Program to calculate the Net Salary. |
| | 3 | Write a program to determine the roots of quadratic equation. |
| | 4 | Write a program to find the largest of three numbers using nested if else. |
| | 5 | Write a program to receive marks of physics, chemistry & maths from user & check its eligibility for course if a) Marks of physics > 40 b) Marks of chemistry > 50 c) Marks of math's > 60 d) Total of physics & math's marks > 150 or e) Total of three subjects marks > 200 |
| LAB 2 | 6 | Write a program to find the value of y for a particular value of n. The a, x, b, n is input by user if n=1 y=ax%b if n=2 y=ax ² +b ² if n=3 y=a-bx if n=4 y=a+x/b |

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| | | |
|--------------|----|---|
| | 7 | Write a program to construct a Fibonacci series upto n terms. |
| | 8 | Write a program to find whether the number is Armstrong number. |
| | 9 | Write a program to generate sum of series $1!+2!+3!+\dots+n!$ |
| | 10 | Write a program to find the sum of following series $1-X1/1!+X2/2!-\dots+Xn/n!$. |
| LAB 3 | 11 | Write a program to print the entire prime no between 1 and 300. |
| | 12 | Write a program to print out all the Armstrong number between 100 and 500. |
| | 13 | Write a program to draw the following figure: <pre> 3 2 1 21 1 * ** *** </pre> |
| | 14 | Write a program to receive a five-digit no and display as like 24689: <pre> 2 4 6 8 9 </pre> |
| LAB 4 | 15 | Write a function that return sum of all the odd digits of a given positive no entered through keyboard. |
| | 16 | Write a program to print area of rectangle using function & return its value to main function. |
| | 17 | Write a program to calculate the factorial for given number using function. |
| | 18 | Write a program to find sum of Fibonacci series using function. |
| | 19 | Write factorial function & use the function to find the sum of series $S=1!+2!+\dots+n!$. |
| LAB 5 | 20 | Write a program to find the factorial of given number using recursion. |
| | 21 | Write a program to find the sum of digits of a 5 digit number using recursion. |
| | 22 | Write a program to calculate the GCD of given numbers using recursion. |
| | 23 | Write a program to convert decimal number in to binary number. |
| | 24 | Write a program to convert binary number in to decimal number. |
| LAB 6 | 25 | Write a program to delete duplicate element in a list of 10 elements & display it on screen. |
| | 26 | Write a program to merge two sorted array & no element is repeated during merging. |
| | 27 | Write a program to evaluate the addition of diagonal elements of two square matrixes. |
| | 28 | Write a program to find the transpose of a given matrix & check whether it is symmetric or not. |
| | 29 | Write a program to print the multiplication of two N*N (Square) matrix. |
| LAB 7 | 30 | Write a program in C to check whether the given string is a palindrome or |

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| | | |
|--------|----|---|
| | | not. |
| | 31 | Write program to sort the array of character (String) in alphabetical order like STRING in GINRST. |
| | 32 | Write a program to remove all the blank space from the string & print it, also count the no of characters. |
| | 33 | Write a program to store the following string “zero”, “one” -----“five”. Print the no in words, given in figure as 3205. |
| LAB 8 | 34 | Write a program to compare two given dates. To store a date uses a structure that contains three members namely day, month and year. If the dates are equal then display message equal otherwise unequal. |
| | 35 | Define a structure that can describe a hotel. It should have the member that includes the name, address, grade, room charge and number of rooms. Write a function to print out hotel of given grade in order of room charges. |
| | 36 | Define a structure called cricket with player name, team name, batting average, for 50 players & 5 teams. Print team wise list contains names of player with their batting average. |
| LAB 9 | 37 | Write a c program to copy & count the character content of one file says a.txt to another file b.txt. |
| | 38 | Write a program to take 10 integers from file and write square of these integer in other file. |
| | 39 | Write a program to read number from file and then write all ‘odd’ number to file ODD.txt & all even to file EVEN.txt. |
| | 40 | Write a program to print all the prime number, between 1 to 100 in file prime.txt. |
| | 41 | Write the following C program using pointer: a) To sort the list of numbers through pointer b) To reverse the string through pointer. |
| LAB 10 | 42 | Write a program to find the largest no among 20 integers array using dynamic memory allocation. |
| | 43 | Using Dynamic Memory Allocation, Write a program to find the transpose of given matrix. |
| | 44 | Write a program to find the factorial of given number using command line argument. |
| | 45 | Write a program to find the sum of digits of a 5 digit number using command line argument. |

Note:

- a) **The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner**
- b) **It is also suggested that open source tools should be preferred to conduct the lab. Some open source online compiler to conduct the C lab are as follows:**

- ❖ <https://www.jdoodle.com/c-online-compiler/>
- ❖ https://www.tutorialspoint.com/compile_c_online.php
- ❖ <https://www.programiz.com/c-programming/online-compiler/>
- ❖ <https://www.hackerrank.com/>

KCS151P- Programming for Problem Solving Lab: Mapping with Virtual Lab

| Name of the Lab | Name of the Experiment |
|----------------------------|-------------------------------|
| Problem Solving Lab | Numerical Representation |
| | Beauty of Numbers |
| | More on Numbers |
| | Factorials |
| | String Operations |
| | Recursion |
| | Advanced Arithmetic |
| | Searching and Sorting |
| | Permutation |
| | Sequences |

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| KEE-151P KEE-251P | ELECTRICAL ENGINEERING LAB | 0L:0T:2P | 1 Credit |
|----------------------|----------------------------|----------|----------|

SUGGESTIVE LIST OF EXPERIMENTS:

(A) Hardware based experiments

1. Verification of Kirchhoff's laws.
2. Verification of Superposition and Thevenin Theorem.
3. Measurement of power and power factor in a single phase ac series inductive circuit and study improvement of power factor using capacitor
4. Study of phenomenon of resonance in RLC series circuit and obtain resonant frequency.
5. Connection and measurement of power consumption of a fluorescent lamp (tube light).
6. Measurement of power in 3- phase circuit by two wattmeter method and determination of its power factor for star as well as delta connected load.
7. Determination of parameters of ac single phase series RLC circuit.
8. To observe the B-H loop of a ferromagnetic material in CRO.
9. Determination of (i) Voltage ratio (ii) polarity and (iii) efficiency by load test of a single phase transformer.
10. Determination of efficiency of a dc shunt motor by load test.
11. To study running and speed reversal of a three phase induction motor and record speed in both directions.
12. Demonstration of cut-out sections of machines: dc machine, three phase induction machine, single phase induction machine and synchronous machine.

(B) Experiments available on virtual lab

1. Kirchhoff's laws.
Virtual lab link: <http://vlab.amrita.edu/?sub=3&brch=75&sim=217&cnt=2>
2. Thevenin Theorem.
Virtual lab link: <https://vlab.amrita.edu/?sub=1&brch=75&sim=313&cnt=1>
3. RLC series resonance.
Virtual lab link: <https://vlab.amrita.edu/?sub=1&brch=75&sim=330&cnt=1>
4. Measurement of power in 3- phase circuit by two wattmeter method and determination of its power factor for star as well as delta connected load.
Virtual lab link: <http://vp-dei.vlabs.ac.in/Dreamweaver/measurement.html>
5. Determination of parameters of ac single phase series RLC circuit.
Virtual lab link: <https://vlab.amrita.edu/?sub=1&brch=75&sim=332&cnt=1>
6. To observe the B-H loop of a ferromagnetic material in CRO.
Virtual lab link: <https://vlab.amrita.edu/?sub=1&brch=282&sim=1507&cnt=2>
7. Determination of the efficiency of a dc motor by loss summation method (Swinburne's test).
Virtual lab link: <http://em-iitr.vlabs.ac.in/exp5/index.php?section=Theory>

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Course Outcomes: At the end of this course students will demonstrate the ability to:

1. Conduct experiments illustrating the application of KVL/KCL and network theorems to DC electrical circuits.
2. Demonstrate the behavior of AC circuits connected to single phase AC supply and measure power in single phase as well as three phase electrical circuits.
3. Perform experiment illustrating BH curve of magnetic materials.
4. Calculate efficiency of a single phase transformer and DC machine.
5. Perform experiments on speed measurement and reversal of direction of three phase induction motor and Identify the type of DC and AC machines based on their construction.

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|------------------------------------|------------------------|-----------------|-----------------|
| KEC-151P KEC-251P | ELECTRONICS LAB | 0L:0T:2P | 1 Credit |
|------------------------------------|------------------------|-----------------|-----------------|

SUGGESTIVE LIST OF EXPERIMENTS:

Part A

1. Study of various types of Active & Passive Components based on their ratings.
2. Identification of various types of Printed Circuit Boards (PCB) and soldering Techniques.
3. PCB Lab: a. Artwork & printing of a simple PCB. b. Etching & drilling of PCB
4. Winding shop: Step down transformer winding of less than 5VA.
5. Soldering shop: Soldering and disordering of Resistor in PCB. Soldering and disordering of IC in PCB. Soldering and disordering of Capacitor in PCB

Part B

1. Study of Lab Equipments and Components: CRO, Multimeter, and Function Generator, Power supply- Active, Passive Components and Bread Board.
2. P-N Junction diode: Characteristics of PN Junction diode - Static and dynamic resistance measurement from graph.
3. Applications of PN Junction diode: Half & Full wave rectifier- Measurement of Vrms, Vdc, and ripple factor.
4. Characteristics of Zener diode: V-I characteristics of zener diode, Graphical measurement of forward and reverse resistance.
5. Characteristic of BJT: BJT in CE configuration.
6. To study Operational Amplifier as Adder and Subtractor
7. Verification of Truth Table of Various Logic Gate.
8. Implementation of the given Boolean function using logic gates in both SOP and POS forms.

(C)

| | | |
|---------------|---|--|
| Part A | PCB Lab: a. Artwork & printing of a simple PCB. b. Etching & drilling of PCB | This practical is not possible by virtual lab. It will be conducted only in physical mode |
| Part B | Study of Lab Equipment's and Components: CRO, Multimeter, Function Generator, Power supply- Active, Passive Components and Bread Board. | NA, These test equipment can be Demonstrated on line from any lab of ECE department or physical mode is only option. |

(D) Experiments available on virtual lab

| | |
|--|--|
| P-N Junction on diode: Characteristics of PN Junction diode - Static and dynamic resistance measurement from graph. | http://vlabs.iitkgp.ernet.in/be/exp5/index.html |
| Applications of PN Junction diode: Half & Full wave rectifier- Measurement of Vrms, Vdc, and ripple factor. | http://vlabs.iitkgp.ernet.in/be/exp6/index.html http://vlabs.iitkgp.ernet.in/be/exp7/index.html |
| Characteristics of Zener diode: V-I characteristics of Zener diode, Graphical measurement of forward and reverse resistance. | http://vlabs.iitkgp.ernet.in/be/exp10/index.html |
| Characteristic of BJT: BJT in CE configuration. | http://vlabs.iitkgp.ernet.in/be/exp11/index.html |
| To study Operational Amplifier as Adder and Subtractor | http://vlabs.iitkgp.ernet.in/be/exp17/index.html http://vlabs.iitkgp.ernet.in/be/exp18/index.html |
| Verification of Truth Table of Various Logic Gate | https://de-iitr.vlabs.ac.in/digital-electronics-iitr/exp/truth-table-gates/ |
| Implementation of the given Boolean function using logic gates in both SOP and POS forms. | https://de-iitr.vlabs.ac.in/digital-electronics-iitr/exp/realization-of-logic-functions/ |

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|--------------------|--|-----------------|-----------------|
| KMC 101/201 | ARTIFICIAL INTELLIGENCE FOR ENGINEERS | 2L:0T:0P | 2 Credit |
|--------------------|--|-----------------|-----------------|

| | The students will be able to | Blooms Taxonomy |
|------------|--|-----------------|
| CO1 | Understand the evolution and various approaches of AI | K2 |
| CO2 | Understand data storage, processing, visualization, and its use in regression, clustering etc. | K2 |
| CO3 | Understand natural language processing and chatbots | K2 |
| CO4 | Understand the concepts of neural networks | K2 |
| CO5 | Understand the concepts of face, object, speech recognition and robots | K2 |

| Course | Topics |
|---------------|---|
| Unit 1 | An overview to AI |
| 1.1 | The evolution of AI to the present |
| 1.2 | Various approaches to AI |
| 1.3 | What should all engineers know about AI? |
| 1.4 | Other emerging technologies |
| 1.5 | AI and ethical concerns |
| Unit 2 | Data & Algorithms |
| 2.1 | History Of Data |
| 2.2 | Data Storage And Importance of Data and its Acquisition |
| 2.3 | The Stages of data processing |
| 2.4 | Data Visualization |
| 2.5 | Regression, Prediction & Classification |
| 2.6 | Clustering & Recommender Systems |
| Unit 3 | Natural Language Processing |
| 3.1 | Speech recognition |
| 3.2 | Natural language understanding |
| 3.3 | Natural language generation |
| 3.4 | Chatbots |
| 3.5 | Machine Translation |
| Unit 4 | Artificial Neural Networks |
| 4.1 | Deep Learning |
| 4.2 | Recurrent Neural Networks |
| 4.3 | Convolutional Neural Networks |
| 4.4 | The Universal Approximation Theorem |
| 4.5 | Generative Adversarial Networks |
| Unit 5 | Applications |
| 5.1 | Image and face recognition |
| 5.2 | Object recognition |
| 5.3 | Speech Recognition besides Computer Vision |
| 5.4 | Robots |
| 5.5 | Applications |

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Reference Books:

1. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig, Prentice Hall
2. Artificial Intelligence by Kevin Knight, Elaine Rich, Shivashankar B. Nair, Publisher : McGraw Hill
3. Data Mining: Concepts and Techniques by Jiawei Han, Micheline Kamber, Jian Pei, Publisher: Elsevier Science.
4. Speech & Language Processing by Dan Jurafsky, Publisher : Pearson Education
5. Neural Networks and Deep Learning A Textbook by Charu C. Aggarwal, Publisher: Springer International Publishing
6. Introduction to Artificial Intelligence By Rajendra Akerkar, Publisher : PHI Learning

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|-------------------|--|-----------------|-----------------|
| KMC102/202 | EMERGING TECHNOLOGY FOR ENGINEERING | 2L:0T:0P | 2 Credit |
|-------------------|--|-----------------|-----------------|

Course Objectives:

1. To understand the basic concepts of IoT, followed by major components, its layer architecture and how IoT is impacting the Industry in the various forms along with major applications.
2. To make students aware about basic concepts of cloud computing, its benefits and different applications along with insights of major service providers.
3. To understand the basic concepts of Blockchain and its underlying technologies with its implementation as cryptocurrencies.
4. To understand the concept of Additive Manufacturing, its applications in various fields and the basic concepts of drones, their assembly and government regulations involved.
5. To introduce students to the upcoming technology and to develop the required skills for practical applications.

| The students will be able to | | Blooms Taxonomy |
|-------------------------------------|---|------------------------|
| CO1 | Understand the concepts of internet of things, smart cities and industrial internet of things | K2 |
| CO2 | Understand the concepts of cloud computing | K2 |
| CO3 | Understand the concepts of block chain, cryptocurrencies, smart contracts | K2 |
| CO4 | Understand design principles, tools, trends in 3 D printing and drones | K2 |
| CO5 | Understand augmented reality (AR), virtual reality (VR), 5G technology, brain computer interface and human brain | K2 |

| Course | EMERGING TECHNOLOGY FOR ENGINEERING |
|---------------|--|
| Unit 1 | Internet of Things |
| 1.1 | What is the Internet of Things? |
| 1.2 | Sensors, their types and features |
| 1.3 | IoT components: layers |
| 1.4 | Smart Cities |
| 1.5 | Industrial Internet of Things |
| Unit 2 | Cloud Computing |
| 2.1 | Cloud Computing : it's nature and benefits |
| 2.2 | AWS |
| 2.3 | Google |
| 2.4 | Microsoft |
| 2.5 | Vendor Offering - IBM |
| Unit 3 | Blockchain |
| 3.1 | What is Blockchain? Fundamentals |
| 3.2 | Principles and Technologies |
| 3.3 | Cryptocurrencies |
| 3.4 | Smart Contracts |
| 3.5 | Blockchain Applications and use cases |

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| Unit 4 | Digital Manufacturing : 3D Printing & Drones |
| 4.1 | The history and survey of 3D Printing |
| 4.2 | Design Principles and Tools |
| 4.3 | Emerging Trends & Use Cases in 3D Printing |
| 4.4 | Introduction of Drones, Engineering Disciplines |
| 4.5 | Multicopter Drone Assembly Course /Regulations and procedures for becoming a drone pilot |
| Unit 5 | Future Trends |
| 5.1 | Augmented Reality (AR) and Virtual Reality (VR) |
| 5.2 | History, objective & global scenario of 5G Telecom |
| 5.3 | 5G in India, Application and Use Cases |
| 5.4 | Brain Computer Interface, Application, Modal and Global Market |
| 5.5 | Brain Computer Interface and Human Brain |

References Books:

IoT:

1. Internet of Things(IoT): Systems and Applications: Mehmet R. Yuce, Jamil Y. Khan
2. IoT Fundamentals: Networking Technologies, Protocols and Use Cases for the Internet of Things: David Hanes, Patrick Grossetete, Gonzalo Salgueiro.
3. Designing the Internet of Things: McEwen, Adrian, Cassimally, Hakim.

Cloud Computing:

1. Mastering Cloud Computing: Foundations and Applications Programming Book by Christian Vecchiola, Rajkumar Buyya, and S. Thamarai Selvi
2. Cloud Computing – Concepts, Technology and Architecture Pearson Thomas Erl
3. Cloud Computing Master the Concepts, Architecture and Applications with Real-world examples and Case studies By Ruchi Doshi, Temitayo Fagbola, Mehul Mahrishi.

Blockchain:

1. Block Chain: Blueprint for a New Economy, O'Reilly, Melanie Swan
2. Blockchain Basics: A Non-Technical Introduction in 25 Steps by: Daniel Drescher.

Digital Manufacturing:

1. Designing Reality: How to Survive and Thrive in the Third Digital Revolution by Prof. Niel Gershenfeld.
2. Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing by Ian Gibson.
3. Build a Drone: A Step-by-Step Guide to Designing, Constructing, and Flying Your Very Own Drone by Barry Davies.

Future Trends:

1. Alan B Craig, William R Sherman and Jeffrey D Will, "Developing Virtual Reality Applications: Foundations of Effective Design", Morgan Kaufmann, 2009.
2. Doug A Bowman, Ernest Kuijff, Joseph J La Viola, Jr and Ivan Poupyrev, "3D User Interfaces, Theory and Practice", Addison Wesley, USA, 2005.
3. Simon Haykin, "Communication Systems", 4th Edition, Wiley India

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|---------|---------------|----------|
| KNC-101 | SOFT SKILLS-I | 2L:0T:0P |
|---------|---------------|----------|

SOFT SKILLS-I

UNIT I- Basics of Applied Grammar and usage

Tenses: Part of Speech, Active & Passive Voice, Articles, Subject-verb agreement, Antonyms, Synonyms, Prefix and Suffix, Narration, Conditional sentences, Concord, Tag questions, punctuation marks.

UNIT II- Presentation and Interaction Skills

Speech Delivery, Interjecting: Objectives & Methodology; Group Discussion: Objectives & Methods; Theme Presentation: Methods; Argumentative skills: Pattern and Ingredients; Debate & Discussion: Unity, Coherence & Emphasis. Public Speaking: Audience Analysis: Approach and Style. Interviews: Types; Focus & Objectives.

UNIT III- Interpersonal Communication Skills

Features: Methods; Principles; Requisites; Team- work; Skills: Empathy, Emotional Intelligence, empathy and listening skills. Time Management; Attitude; Responsibility. Leadership qualities: Integrity; Values; Trust; Self-Confidence & Courage; Communication and Networking; Speed reading; Problem Solving & Trouble- Shooting

UNIT IV- Persuasion and Negotiation Skills

Definition; Understanding Attitude, Beliefs, Values and Behavior; The process of Persuasion: Analysis of Audience; Classification of Audience; Egoistic and Non-Egoistic; Specific Techniques for Specific Audience; Skills of Persuasion, Steps to Persuasion/Influence, Negotiation: Definition; Process of Negotiation: Characteristics; Qualities of good negotiator; Approaches to Negotiation.

UNIT V- Communication Skills

Introduction to oral communication, Nuances & Modes of Speech Delivery, Public speaking: confidence, clarity, and fluency, Non verbal Communication: Kinesics, Paralinguistic features of Voice-Dynamics, Proxemics, Chronemics, and Presentation Strategies: planning, preparation, organization, delivery.

Course Outcome:

Unit 1- Students will be enabled to **understand** the correct usage of grammar.

Unit 2- Students will **apply** the fundamental inputs of communication skills in making speech delivery, individual conference, and group communication.

Unit 3- Students will **evaluate** the impact of interpersonal communication on their performance as a professional and in obtaining professional excellence at the workplace.

Unit 4- Skills and techniques of persuasion and negotiation would **enhance** the level of students at multifarious administrative and managerial platforms.

Unit 5- Student will be able to **equip** with basics of communication skills and will **apply** it for practical and oral purposes by being honed up in presentation skills and voice-dynamics.

Prescribed Books:

1. **Technical Communication, (Second Ed.); O.U.P.,** Meenakshi Raman & S.Sharma New Delhi, 2011
2. **Business Communication for Managers,** Payal Mehra, Pearson, Delhi, 2012.
3. **Personality Development,** Harold R. Wallace et. al, Cengage Learning India Pvt. Ltd; New Delhi 2006
4. **Practical Communication** by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.
5. **Personality Development & Soft Skills,** Barun K.Mitra, Oxford University Press, New Delhi, 2012.
6. **Public Speaking,** William S. Pfeiffer, Pearson, Delhi, 2012.
7. **Human Values,** A.N. Tripathi, New Age International Pvt. Ltd. Publishers New Delhi ,2005

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|---------|----------------|----------|
| KNC-201 | SOFT SKILLS-II | 2L:0T:0P |
|---------|----------------|----------|

SOFT SKILLS-II

UNIT I- LSRW Skills

Active Listening: Meaning and Art of Listening, Pronunciation, Tongue-Twisters, Stress in English Language, Reading style: Skimming; Scanning; Churning & Assimilation, Effective writing tools, Writing: Methods: Inductive; Deductive; Exposition; Linear; Interrupted; Spatial & Chronological etc

UNIT II- Conversational& Social Skills

Definition of Conversation; Speech and Conversation: Distinction; Listening and Conversation; Sustaining Interest; Rules of Conversation; Conversation and Personality; Importance of Conversation: Competence Relationships; Social Skills: Role of Communication; Purposeful Socializing; Attributes: Effective Communication; Conflict Resolution;; Relationship Management; Respect; Improvement Techniques: Feedback; Goal Setting; Affording Resources; Adopting Interpersonal Skills; Importance.

UNIT III- Motivation Skills

Motivation: Definition; Sources of Motivation: Initiative; Willingness To Work; Eagerness to take on Work; Initiative; Learning Ability; Going Extra Miles; Learning And Analysis; Motivating Others: Techniques; One To One Correspondence; Understanding; Individual Motivation; Mobilizing Optimal Performance; Praise and Compliment; Goal Setting for Individual Employee; Individual Cultivation of Skills; Facilitating Active Involvement; Trust in the Working Hands.

UNIT IV- Work-Place Skills

Managing Stress; Techniques: Application of 4 A's; Avoid; Alter; Access; Adapt; Resilience: Flexibility in Thought and Behavior; Tolerance and Self-Belief; Team-Work and Communication; Compassion in Leadership; Communication Skills; Listening and Responding; Speaking Skills; Positive Thinking: Controlling Mind.

UNIT V- Creativity and Critical Thinking

Creativity: Definition; Characteristics of Creative Person: Fluency; Originality; Curiosity; Critical Thinking: Definition; Abilities: Discerning Facts and Claims; Credibility Analysis; Identifying Valid Reasons; Distinguishing Relevant from Irrelevant Fact/Claims; Detecting Bias; Knowing the Hidden Motives; Creative Methods; Features.

Course Outcome:

Unit 1- Students will be able to **converse** well with effective LSRW skills in English.

Unit 2- Students will **evaluate** the importance of conversation in their personal and professional domain and **apply** it for extending their professional frontiers.

Unit 3- Students will learn to **apply** motivation skills for their individual and professional excellence.

Unit 4- Students will **utilize** their teamwork and their interpersonal communication skills to survive and excel at their work-place.

Unit 5- Students will learn to **evaluate** creativity for their professional innovation and critical thinking for their competence.

Prescribed Books:

1. **Technical Communication, (Second Ed.); O.U.P.,** Meenakshi Raman &S.Sharma New Delhi, 2011
2. **Personality Development,** Harold R. Wallace et. al, Cengage Learning India Pvt. Ltd; New Delhi 2006
3. **Personality Development & Soft Skills,** Barun K. Mitra, Oxford University Press, New Delhi, 2012.
4. **Practical Communication** by L.U.B. Pandey; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.
5. **Developing Communication Skills:** by Krishna Mohan, Meera Banerji; McMillan India Ltd, Delhi,1990.
6. **Communication Skills for Engineers and Scientists:** Sangeeta Sharma et. al., THI Learning Pvt Ltd, New Delhi, 2011.
7. **Public Speaking,** William S. Pfeiffer, Pearson, Delhi, 2012.
8. **Human Values,** A.N. Tripathi, New Age International Pvt. Ltd. Publishers New Delhi ,2005.