

**F.E. / F.T.
SEM – I
(A.Y. 2023-24)
B.E. (IT/ MECH /E&TC/M&ME) /
B.Tech. (AI&ML)**

FE/FT Semester – I

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E/F.T. (SEM: I) | | | | |
|---|-----------------|------------------|----------------------|----------------|--|----|-------------------------------|--------------------------|--------------|
| Course Name: Chemistry | | | | | Course Code: BSC1201 | | | | |
| Contact Hours Per Week: 05 | | | | | Credits: 05 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment / Evaluation | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/Oral (25) | Term Work (25) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credits | ISE | IE | ESE | PR | TW |
| 3 | 0 | 2 | 5 | 4 | 20 | 20 | 60 | 25 | 25 |
| ISE: In-Semester Examination - Paper Duration – 1 Hour | | | | | | | | | |
| IE: Innovative Examination | | | | | | | | | |
| ESE: End Semester Examination - Paper Duration - 2 Hours | | | | | | | | | |
| The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) | | | | | | | | | |
| Prerequisite: Intermediate of Science level knowledge of atomic no and atomic weight, monomer, Polymer, Electronic configuration, Thermodynamics and Electrochemistry etc. | | | | | | | | | |
| RBT: Revised Bloom's Taxonomy | | | | | | | | | |

Course Objectives: The course intends to provide a broad function engineering chemistry that stresses scientific reasoning and analytical problem-solving skills of students. Course gives broad spectrum of use of chemistry in day-to-day life. Course also emphasizes on various topics that broadly make a strong foundation for students which can be used in lifelong learning.

Course Outcomes:

| Sr. No. | Course Outcomes | RBT Levels |
|---------|--|--|
| 1 | Understand different types of hardness of water and will get an insight about water quality and purification methods used. | Remember(R), Understand(U), Apply(A) |
| 2 | Understand and apply knowledge of engineering materials. | Remember(R), Understand(U), Apply(A) |
| 3 | Understand the green chemistry and green engineering principles. | Understand(U) Apply(A) |
| 4 | Understand corrosion, its prevention and control. | Remember(R) Understand(U) Apply(A) |
| 5 | Understand fuel, its requirement and various alternatives that can be used. | Understand(U), Apply(A) |
| 6 | Understand the single and multicomponent system. | Understand(U) Apply(A) |

Detailed Syllabus:

| Module No. | Topics | Hrs. | RBT Levels |
|------------|---|------|---|
| 1.0 | Water Technology Introduction – Hard water and soft water. Hardness of water – types – expression of hardness (numerical problems). Estimation of hardness of water by complex metric method (numerical problems). Softening of water by Lime soda process, Zeolite process & Ion exchange process (numerical problems), Potable water and its specifications. Drinking water- Treatments: removal of micro-organisms by adding bleaching powder, chlorination and disinfection by ozone. Electro dialysis, Reverse osmosis and ultra-filtration, Definition and significance of i) BOD ii) COD numerical problems related to BOD & COD, Sewage treatment – activated sludge process. | 9 | Remember (R), Understand (U), Apply (A) |

| | | | |
|-----|---|---|--|
| 2.0 | <p>Engineering materials</p> <p>Composite materials Introduction, Constitution- i) Matrix phase ii) Dispersed phase. Characteristic properties of composite materials. Classification- (A) Particle - reinforced composites- i) Large – particle reinforced composites ii) Dispersion – strengthened composites. (B) Fiber – reinforced composites- i) Continuous – aligned ii) Discontinuous – aligned (short)- (a) aligned (b) randomly oriented (C) Structural Composites- i) Laminates (ii) Sandwich Panels.</p> <p>Nanomaterials: Introduction – Nanoparticles, Nanoclusters, Nanorods, Nanotubes (CNT: SWNT and MWNT) and Nanowires – Properties (surface to volume ratio, melting point, optical and electrical), Synthesis (precipitation, thermolysis, hydrothermal, electrodeposition, sol-gel process).</p> <p>Applications of Engineering materials like Composite materials, nanomaterials, Conducting polymers & Bio polymers.</p> | 8 | Remember (R), Understand (U), Apply(A) |
| 3.0 | <p>Green Chemistry & Green Engineering</p> <p>Introduction to Green Chemistry, The 12 principles of Green Chemistry, Prevention of waste, Atom Economy, Less hazardous Chemical synthesis, Safer solvent and Auxiliary, Design for energy efficiency, use of renewable feedstock, Reduction of derivatives, Catalysis, Design for degradation, Real time analysis (Uses of electronic devices and sensors for process control), inherently safer chemistry for accident prevention. Design of Greener route of synthesis over conventional route, Numerical based on calculation of Atom economy. Concept of green engineering and its application for providing sustainable solution to industry.</p> | 5 | Remember (R), Understand (U), Apply(A) |

| | | | |
|-----|---|---|--|
| 4.0 | Corrosion: prevention & Control Introduction of Corrosion, Fundamental reason, Mechanism of corrosion-i) Electrochemical/Wet Corrosion mechanism a) Evolution of hydrogen gas and b) Absorption of oxygen gas, ii) Direct Chemical/Dry/ Atmospheric Corrosion a) Due to oxygen b) Due to other gases Factors affecting the rate of corrosion, Types of corrosion-Galvanic cell corrosion, Concentration cell corrosion (Differential aeration principle) Pitting Corrosion, Stress corrosion, methods to minimize the corrosion-I) Material selection and Proper design, II) Cathodic protection i) Sacrificial anodic protection ii) Impressed current method III) Anodic protection, IV) Metallic coating i) Anodic coating (Galvanization) ii) Cathodic coating (Tinning). Methods of application of metallic coatings. | 9 | Remember (R), Understand (U), Apply(A) |
| 5.0 | Fuel Definition, classification of fuels-solid, liquid and gaseous. Calorific value-Definition, Gross or Higher calorific value & Net or lower calorific value, units of heat (no conversions), Dulong's formula & numerical for calculations of Gross and Net calorific values. Characteristics of a good fuel. Solid Fuels - Analysis of coal - Proximate Analysis of Coal and Numerical. Ultimate Analysis with Significance and numerical. Liquid fuels- Crude petroleum oil, its composition and classification and mining (in brief). Refining of crude oil- Fractional Distillation with diagram and composition and uses table. Cracking- Definition, Types of cracking- I) Thermal cracking. II) Catalytic cracking- (i) Fixed-bed catalytic cracking (ii) Moving-bed catalytic cracking. Advantages of Catalytic cracking. Combustion- Calculations for requirement of only oxygen and air (by weight and by volume only) for given solid & gaseous fuels. Green energy such as Hydrogen, Power alcohol, Biodiesel. Biodiesel- Method to obtain Biodiesel from vegetable oils (Trans-esterification), advantage and disadvantages of biodiesel. | 9 | Remember (R), Understand (U), Apply(A) |

| | | | |
|-----|--|---|--|
| 6.0 | Phase rule | 5 | Remember (R), Understand (U), Apply(A) |
| | Gibb's Phase Rule and explanation of terms involved in it, One component system eg. Water, Reduced phase rule, Two component system eg. Pb-Ag system. Limitations of Phase Rule. | | |

Suggested List of Practical/ Experiments:

| Practical Number | Practical/ Experiment Topic | Hrs. | RBT Levels |
|-------------------------|--|-------------|--|
| 1 | To study the effect of the change in temperature or viscosity of a lubricating oil by using a redwood viscometer no. 1. | 2 | Understand (U) Apply(A) |
| 2 | Molecular weight determination of polymer by Ostwald Viscometer. | 2 | Understand (U) Apply(A) |
| 3 | Separation of organic binary mixture using thin layer chromatography | 2 | Understand (U) Apply(A) |
| 4 | Determination of Total hardness of water by complexometric titration using EDTA | 2 | Understand (U) Apply(A) |
| 5 | Determination of Permanent hardness of water by complexometric titration using EDTA | 2 | Understand (U) Apply(A) |
| 6 | Estimation Saponification value of an lubricating oil. | 2 | Understand (U) Apply(A) |
| 7 | Estimation of Acid value of used lubricating oil. | 2 | Understand (U) Apply(A) |
| 8 | Determination of Zn/Cu in brass. | 2 | Understand (U) Apply(A) |
| 9 | Synthesis of a Meta dinitrobenzene (drug intermediate). | 2 | Understand (U) Apply(A) and Create(C) |
| 10 | To determine λ_{\max} and Molar extinction coefficient of given solution of KMnO ₄ using Colorimeter. | 2 | Understand (U) Apply(A) |
| 11 | To estimate the emf of Cu-Zn system by Potentiometry. | 2 | Understand (U) Apply(A) |
| 12 | Determination of Moisture content of coal. | 2 | Understand (U) Apply(A) |
| 13 | Inorganic Preparation: Preparation of Tetraamine copper (II) Sulphate | 2 | Understand (U) Apply(A) |
| 14 | Determination of Percentage of Iron in Plain Carbon Steel. | 2 | Apply(A) |
| 15 | Demonstration of Column Chromatography | 2 | Understand (U) Apply(A) |

Practical Outcomes:

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering. The students will learn to:

| Sr. No. | Laboratory Outcome | RBT Levels |
|---------|---|---|
| PO-1 | Estimate Hardness and some other important properties of water to be used for various industrial and domestic uses. | Understand (U) Apply (A) |
| PO-2 | Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc. | Understand (U) Apply (A) |
| PO-3 | Synthesize a small drug molecule using principle of Green Chemistry | Understand (U) Apply (A) and Create(C) |
| PO-4 | Estimate the some important properties of lubricating oil to understand its suitability for industrial application | Understand (U) Apply (A) |
| PO-5 | Use the Spectrophotometric/Colorimetric device for measurement of concentration of unknown solution | Understand (U) Apply (A) |

Books and References:

| Sr. No. | Name of Book | Author Name | Edition |
|---------|---|---------------------------|-----------------|
| 1 | An Introduction to Cheminformatics | Andrew R Leach | - |
| 2 | Physical Chemistry I & II | Dr. Hrishikesh Chatterjee | 2 nd |
| 3 | Physical Chemistry | Atkins | 8 th |
| 4 | Principle of Instrumental Analysis | Skoog, Holler Gauch | 7 th |
| 5 | Vogels Textbook of quantitative chemical Analysis | Vogel | 8 th |
| 6 | Organic Chemistry | Morrison Boyd | 7 th |
| 7 | QSAR and Molecular Modelling | S.P Gupta | - |

Online References:

| Sr. No | Website Name | URL | Modules Covered |
|--------|--|---|-----------------|
| 1. | Free Open Source simulator Project | http://www.hplcsimulator.org/ | M-2 |
| 2. | Thin Layer Chromatography Simulation | https://elearning.cpp.edu/learning-objects/organic-chemistry/tlc/?page=simulation.html | M-2 |
| 3. | Gas Chromatography: Simulation & Optimization software | https://www.gc-sos.com/download | M-2 |
| 4. | IIT B Virtual Lab (Column Chromatography) | http://vlab.amrita.edu/?sub=2&brch=191&sim=341&cnt=1 | M-2 |
| 5. | Simulation of UV-Visible Photometer | https://terpconnect.umd.edu/~toh/models/UVVis.html | M-5 |
| 6. | IIT B Virtual Lab (CFSE Calculation) | http://vlab.amrita.edu/?sub=2&brch=193&sim=610&cnt=1 | M-1 |
| 7. | IIT B Virtual Lab (Hardness of Water) | http://vlab.amrita.edu/?sub=2&brch=193&sim=1548&cnt=1 | M-1 |
| 8. | IIT B Virtual Lab (UV-Visible Spectroscopy) | http://vlab.amrita.edu/?sub=2&brch=190&sim=338&cnt=1 | M-5 |
| 9. | IIT B Virtual Lab (EMF Measurement) | http://vlab.amrita.edu/?sub=2&brch=190&sim=361&cnt=1 | M-4 |
| 10. | IIT B Virtual Lab (IR Spectroscopy) | http://ccnsb06-iiith.vlabs.ac.in/Experiments.html?domain=%20Chemical%20Sciences | M-5 |
| 11 | Mervin Sketch | https://chemaxon.com/products/marvin | M-6 |
| 12 | Chembank | https://data.broadinstitute.org/chembank/assay/index.html | M-6 |

F.E. / F.T Semester –I

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E./F.T. (SEM: I) | | | | | | |
|---|----------|-----------|---------------|---------|--|----|--------------------------------|---------------------------|--------------|------------|--|
| Course Name: Mathematics-I | | | | | Course Code: BSC1202 | | | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment / Evaluation | | | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/Oral (00) | Term Work (25) | Total | | |
| Theory | Tutorial | Practical | Contact Hours | Credits | ISE | IE | ESE | PR | TW | 125 | |
| 4 | 1 | - | 5 | 5 | 20 | 20 | 60 | - | 25 | | |
| ISE: In-Semester Examination - Paper Duration – 1 Hour IE: Innovative Examination ESE: End Semester Examination - Paper Duration - 2 Hours The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) | | | | | | | | | | | |
| Prerequisite: 10+2 level Mathematics | | | | | | | | | | | |

Course Objective: The Course intends to develop the basic Mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. The topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology.

Course Outcomes: Upon completion of the course students will be able to:

| SN | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|-----------|---|---|
| 1 | Apply the fundamentals of calculus and concepts of sequence-series. | L1, L2 |
| 2 | Apply the concept of partial derivatives in its application part. | L1, L2, L3 |
| 3 | Apply the concepts of complex numbers. | L1, L2, L3 |
| 4 | Evaluate the rank of a matrix and its application to solve the system of equations. | L1 |
| 5 | Apply the concept of Gamma and Beta function to evaluate the area and volume | L1, L2, L3 |
| 6 | Inculcate the numerical integration technique by various methods | L1, L2, L3 |

Detailed Syllabus (Total No. of Hours: 60)

| Module No. | Topics | Lectures | Cognitive levels of attainment as per Bloom's Taxonomy |
|-------------------|---|-----------------|---|
| 1 | Calculus-I Mean value theorems (Rolle's, Lagrange's and Cauchy's Theorem), Taylor's series, Maclaurin series for exponential, trigonometric and logarithm functions, Maclaurin theorems with remainders, Indeterminate forms, Convergence of sequence and series, D'Alembert's ratio test, Cauchy's nth root test | 10 | L1, L2 |
| 2 | Multivariable Calculus (Differentiation) Partial derivatives (first and higher order), composite function, Total derivative, Euler's Theorem on homogeneous functions in two and three variables, Maxima, minima and saddle points, Gradient, directional derivative (Self-Study: curl and divergence) | 11 | L1, L2, L3 |
| 3 | Complex Number (Pre-requisite: Basics of Complex Numbers, De' Moivre's theorem) Power of complex expressions, Root of an equation using De' Moivres theorem, Hyperbolic functions, Inverse Hyperbolic functions, Separation into real and imaginary parts, Logarithm of complex number | 7 | L1, L2, L3 |
| 4 | Matrices I Symmetric, Skew-symmetric, Hermitian, Skew-Hermitian and Orthogonal Matrices, Unitary Matrices, Rank, Row-Echelon form, Normal form, Rank-Nullity theorem (without proof), non-Homogeneous system of linear algebraic equations, Homogeneous system of linear algebraic equations, Linear dependence and independence of vectors | 12 | L1 |
| 5 | Calculus-II Gamma functions, Beta functions and their properties, Duplication formula on Beta function, Application of single integral in the evaluation of Surface area, Volumes of revolutions using single integral. | 11 | L1, L2, L3 |

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| 6 | Numerical Integration | 9 | L1, L2, L3 |
| | Numerical integration — the numerical evaluation of an integral, Rectangle method —based on (piecewise) constant approximation, Trapezoidal rule—based on (piecewise) linear approximation, Simpson's rule—based on (piecewise) quadratic approximation, Newton–Cotes formulas — based on generalizes approximation. | | |

Books and References:

| SN | Title | Authors | Publisher | Edition | Year |
|----|--|-----------------------------|-----------------------------|--------------|------|
| 1 | Calculus and Analytic geometry | G.B. Thomas and R.L. Finney | Pearson | 9th Edition | 2002 |
| 2 | Advanced Engineering Mathematics | Erwin Kreyszig | John Wiley & Sons | 9th Edition | 2006 |
| 3 | Engineering Mathematics for first year | Veerarajan T | Tata McGraw-Hill, New Delhi | 3rd Edition | 2008 |
| 4 | Higher Engineering Mathematics | Ramana B.V | Tata McGraw Hill, New Delhi | 11th Edition | 2010 |
| 5 | Higher Engineering Mathematics | B.S. Grewal | Khanna Publishers | 36th Edition | 2010 |
| 6 | A text book of Engineering Mathematics | N.P. Bali and Manish Goyal | Laxmi Publications | 9th Edition | 2008 |

Online References:

| Sr. No | Website Name | URL | Module Covered |
|--------|--|---|----------------|
| 1. | Openstax | https://openstax.org/ | M1-M6 |
| 2 | Lumanlearning .com | https://courses.lumanlearning.com | M1-M6 |
| 3 | Engineering Mathematics Tutorial – Geeks for Geeks | https://www.geeksforgeeks.org/ | M1-M6 |

F.E. / F.T. Semester –I
Choice Based Credit Grading Scheme with Holistic Student Development (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E. / F.T. (SEM : I) | | | | | |
|--|--------------|---------------|------------------|-------------|---|----|----------------------------|-------------------|-------|-----|
| Course Name : Programming for Problem Solving | | | | | Course Code : ESC1201 | | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment / Evaluation | | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/O ral (25) | Term Work (25) | Total | |
| Theor y | Tutori al | Practic al | Contact Hours | Credi ts | ISE | IE | ESE | PR | TW | 150 |
| 3 | -- | 2 | 5 | 4 | 20 | 20 | 60 | 25 | 25 | |
| ISE: In-Semester Assessment - Paper Duration – 1 Hours IE: Innovative Examination ESE: End Semester Examination - Paper Duration – 2 Hours | | | | | | | | | | |
| The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) | | | | | | | | | | |
| Prerequisite: Fundamental Knowledge of Computer, Basics of Mathematics | | | | | | | | | | |

Course Objective: This course aims to provide an exposure in developing an algorithm, flowchart and writing efficient codes for user defined problems. The course will be taught using the C programming language.

Course Outcomes: Upon completion of the course students will be able to:

| SN | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|----|---|--|
| 1 | Demonstrate the fundamentals of computer programming and algorithm. | L1, L2 |
| 2 | Use of primitive data types in a computer programming | L1, L2, L3 |
| 3 | Apply conditional branching and looping to solve problems. | L1, L2, L3 |
| 4 | Make use of functions and storage classes to implement Programs | L1, L2, L3, L4 |
| 5 | Understand and apply non primitive data types in computer Programming | L1, L2, L3 |
| 6 | Utilize structure and pointers to solve problems | L1, L2, L3 |

Detailed Syllabus (Total No. of Hours: 45):

| Module No. | Topics | Lectures | Cognitive levels of attainment as per Bloom's Taxonomy |
|------------|---|----------|--|
| 1 | <p>Introduction to Computer Terminology</p> <p>Introduction: Operating system, Hardware and software processing packages, Knowledge of the internet and its connectivity, Network Communication and networking, Develop concepts of Multimedia Technology. Programming Fundamentals, Algorithm, Three construct of Algorithm and flowchart: Sequence, Decision (Selection) and Repetition, Characteristics of good algorithm.</p> <p>Database Application: Introduction to Database System, View of data, Database Architecture, Basic Commands.</p> | 4 | L1, L2 |
| 2 | <p>Fundamentals of C-Programming</p> <p>Structure of C program Basics of C programming, Execution of a Program, Character Set, identifiers and keywords, data types, enumerated datatype and its size of types, constants and variable.</p> <p>Operators: Arithmetic operators, relational and logical operators, Increment and Decrement operators, assignment operators, the conditional operator, Assignment operators, operation on bits and expression, Block Structure, Initialization, C Pre-processor, Programs on Operators.</p> <p>Data Input and Output –printf(), scanf(), putchar(), getchar(), puts(), gets().</p> <p>Fundamentals of the graphics design: Drawing basic shapes.</p> | 6 | L1, L2, L3 |
| 3 | <p>Conditional Branching & Loops</p> <p>Branching/Selection - if statement, if-else Statement, Multiway decision, Switch statement (Menu Driven Programs)</p> <p>Iterative/Looping – while, do-while, for loop</p> <p>Jump Statements- Continue statement, Break statement, goto statement, return statement</p> <p>Calculation of time complexity of the</p> | 8 | L1, L2, L3 |

| | | | |
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| | problems | | |
| 4 | <p style="text-align: center;">Functions and Recursion</p> <p>Basics of functions, Initialization and Declaration of Function, User defined and Library functions, Function parameters, Call by value, Call by reference, Recursion Vs Iteration. Library Function: math.h, ctype.h Storage Classes: Auto, Register, Static, Extern</p> | 7 | L1, L2, L3, L4 |
| 5 | <p style="text-align: center;">Arrays Strings and Structures</p> <p>Introduction to array: Declaration, Definition, accessing array element, bounds checking, passing array elements to functions, one dimensional, Example Program: Computing Mean, median and Mode, multi-dimensional array.</p> <p>Strings: Standard Library String functions, Operation on string without using library function from string.h, two dimensional array of characters.</p> <p>Structures: Basics of structures, Structures and Functions Nested Structures Passing Each Member of Structure as a separate argument, Arrays of Structures</p> | 8 | L1, L2, L3 |
| 6 | <p style="text-align: center;">C++ Programming</p> <p>Introduction to C++ program, How C++ differs from C, Variable Declaration, Basic of console input output, Function overloading and Operator overloading, Classes, Pointers, Access Specifiers, OOPs concepts, programs on C++.</p> | 12 | L1, L2, L3 |

List of Practical/ Experiments:

| Practical No. | Practical/Experiment Topic |
|---------------|--|
| 1 | <ul style="list-style-type: none"> A. Design an algorithm and flowchart to accept the distance between two cities in kilometers from the keyboard. Calculate and display this distance in meter, feet, cms, and inches. B. Design an algorithm and flowchart to accept a number from user and find the remainder after dividing it by 2 and 3 C. Design a program to print the size of fundamental types (SizeofTypes). |

| | |
|---|--|
| | <p>D. Write an SQL Query for</p> <ul style="list-style-type: none"> • Create Database • Create Table • Insert values into the Table • Show table • Update and Delete the Table • Drop the Table |
| 2 | <p>A. Write a program to accept two numbers and display the result of their bitwise AND, OR, EXOR, and NOT Operations.</p> <p>B. A company XYZ is having Four Categories of employees. Rent allowance of employees can be calculated according to their categories as follows:</p> <p>Category 1: 30% of Salary Category 2: 20% of Salary Category 3: 10% of Salary Category 4: 5% of Salary</p> <p>Write a program to read employees number, category and salary and find its rent allowance</p> <p>C. Design an algorithm draw a flowchart to display the square, cube, fourth power,...n th power of x, where x is an integer taken from user.</p> |
| 3 | <p>A. Write a Program to find real roots of a quadratic equation. Read all necessary inputs using input methods and display the roots</p> <p>B. Write a menu driven program to print a multiplication table of given numbers using for loop, while loop and do-while loop.</p> <p>C. Write a program to demonstrate the use of Jump statements</p> <ul style="list-style-type: none"> • break statements • continue statements • return statements |
| 4 | <p>A. Write a program to find the Factorial of the number using functions.</p> <p>B. Write a program to check a given number is prime or not using recursion</p> <p>C. Write a program to test math.h, ctype.h library functions.</p> <p>D.</p> |
| 5 | <p>A. C program to print array elements in reverse order.</p> <p>B. Write a c program to stored the student record using structure.</p> <p>C. Write a Program that Implements string handling functions with and without using string library functions.</p> <p>D. Write a Program to check whether the given string is palindrome or not.</p> |

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|----|--|
| | |
| 6 | <ul style="list-style-type: none"> A. Write a program in c++ to accept 2 nos from user, find out the sum and average of given inputnumber? B. Write a program in c++ to accept the marks by students in five different subjects are input through the keyword. Find out the aggregate marks and percentage marks obtained by the students. assume that maximum marks which is obtained by the students in each subject is 100. C. Write a program to demonstrate function definition outside class and accessing class members in function definition. D. Overload the operator unary(-) for demonstrating operator overloading. |
| 7 | <ul style="list-style-type: none"> A. Write a program to find the transpose of a Square Matrix without using another matrix. B. Write a Program that reads two matrices values A (m x n) and B(p x q) Display Matrix Addition in proper matrix format |
| 8 | <ul style="list-style-type: none"> A. Write a Program that Implements string handling functions with and without using string library functions. B. Write a Program to check whether the given string is palindrome or not. |
| 9 | <ul style="list-style-type: none"> A. Implement a C Program to accept two numbers from the user and swap them. Pass the values to be swapped to the function using call by reference method. B. A sport club of cricket needs to maintain data about players. Description of it is given below. Clubs want to maintain the player's name, age, no of matches played, no of runs, and average. For the above description declare a structure and Display data in the descending order of number of runs made. Implement a C Program for the above problem. |
| 10 | <ul style="list-style-type: none"> A. Design a puzzle game draw the basic shapes using graphics.h library function |

Books and References:

| Sr. No. | Title | Authors | Publisher | Edition | Year |
|---------|------------------------|--------------------------------------|------------------------|--------------------------|------|
| 1 | MASTERING C | K. R. Venugopal and Sudeep R. Prasad | McGraw Hill | 2 nd Edition | 2006 |
| 2 | Programming inANSI C | E Balaguruswamy | McGrawHill | 8 th Edition | 2018 |
| 3 | Programming in C | Pradeep Dey and Manas Gosh | Oxford UniversityPress | 2 nd Edition | 2011 |
| 4 | Let Us C | Yashwant Kanetkar | BPB | 16 th Edition | 2018 |
| 5 | Data Structuresusing C | Aaron M. Tenenbaum | Pearson | 7th Edition | 2009 |

Online References:

| Sr. No. | Website Name | URL | Modules Covered |
|---------|-----------------|---|-----------------|
| 1 | Javapoint | https://www.javatpoint.com/c-programming-language-tutorial | M1 – M6 |
| 2 | Programiz | https://www.programiz.com/c-programming | M1 – M6 |
| 3 | Tutorials Point | http://www.tutorialspoint.com/cprogramming/c_overview.htm | M1 – M6 |

F.E./F.T. Semester – I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E./ F.T (SEM: I) | | | | |
|---|-----------------|------------------|----------------------|----------------|--|-----------|----------------------------|-----------------------|--------------|
| Course Name: Engineering Mechanics | | | | | Course Code: ESC1202 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/Summative) | | | | |
| Modes of Teaching/Learning/Weightage | | | | | Modes of Continuous Assessment/Evaluation | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/Oral (00) | Term Work (25) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credits | ISE | IE | ESE | PR | TW |
| 3 | -- | 2 | 5 | 4 | 20 | 20 | 60 | 25 | 25 |
| ISE: In-Semester Examination - Paper Duration – 1 Hour | | | | | | | | | |
| IE: Innovative Examination | | | | | | | | | |
| ESE: End Semester Examination - Paper Duration - 2 Hours | | | | | | | | | |
| The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance/ Learning Attitude (20%) | | | | | | | | | |
| Prerequisite: Basics of Force, displacement, Velocity, acceleration & related concept from Physics. Also required basics of mathematics like integration & differentiation | | | | | | | | | |

Course Objective: This course aims to expound the basic fundamentals of force & its effects on static and dynamic systems and thereby provide a strong base for various engineering subjects.

Course Outcomes: Upon completion of the course students will be able to:

| SN | Course Outcomes | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|-----------|--|---|
| 1 | Find resultant/equilibrant of different types of coplanar force system and locate the centroid of plane lamina. | L1, L2 |
| 2 | Construct free body diagram of a coplanar system and calculate the reactions for static equilibrium. | L1, L2, L3 |
| 3 | Analyze problems related to friction for system containing block, wedge, ladder etc. | L1, L2, L3 |
| 4 | Find resultant of different types of non-coplanar force system | L1, L2, L3 |
| 5 | Analyze Projectile motion of the particle and draw motion curves. Locate instantaneous center of rotation and find linear and angular velocity for different links for rigid bodies having plane motion. | L1, L2, L3 |
| 6 | Apply D'Alembert's principle, Work energy principle, Impulse momentum theorem in the problems based on Kinetics of Particles | L1, L2, L3 |

Detailed Syllabus (Total No. of Hours: 45):

| Sr. No. | Topics | Lectures | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|---------|--|----------|--|
| 01 | <p>System of Coplanar Forces: Concept of Rigid and Deformed Bodies, Fundamental concepts and principles of mechanics: Newtonian Mechanics, Resolution of force, Moment of force about a point, Couple, Varignon's Theorem. Resultant of Coplanar system of forces, Force couple system. Centroid of composite plane lamina.</p> | 08 | L1, L2 |
| 02 | <p>Equilibrium of System of Coplanar Forces: Free Body Diagram, Condition of Equilibrium. Equilibrium of system consisting of several forces.</p> <p>Types of support: Types of loads, Types of Beams, Determination of reactions at supports for various types of loads on beams. (Excluding problems on internal hinges)</p> <p>Trusses: Definition, Types of Trusses, Condition of Perfect Truss, Problems on method of joints and method of section.</p> | 08 | L1, L2, L3 |
| 03 | <p>Friction: Introduction to Laws of friction, angle of friction, angle of repose, cone of friction. Equilibrium of bodies on inclined plane, Application to problems involving blocks, wedges, ladders.</p> | 05 | L1, L2, L3 |
| 04 | <p>Forces in space: Resultant & Equilibrium of concurrent force system, parallel force system and non-concurrent non-parallel force system in 3D space</p> | 06 | L1, L2, L3 |
| 05 | <p>Kinematics of a Particle: Introduction to different types of motion, Projectile motion.</p> <p>Kinematics of a Rigid Body: Introduction to general plane motion, Instantaneous center of rotation for the mechanisms up to three links only.</p> | 09 | L1, L2, L3 |

| | | | |
|-----------|--|----|------------|
| 06 | Kinetics of a Particle: Force and Acceleration: Newton's second law of motion, D'Alembert's Principle, Equations of dynamic equilibrium for rectilinear and curvilinear motion, Work and Energy: Principle of work and energy, Law of conservation of energy. Impulse and Momentum: Principle of linear impulse and momentum and its application, principle of conservation of momentum | 09 | L1, L2, L3 |
|-----------|--|----|------------|

Suggested List of Practical/ Experiments:

| Practical Number | Type of Experiment | Practical/ Experiment Topic | Hrs. | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|-------------------------|---------------------------|---|-------------|---|
| 1 | Basic Experiments | Polygon law of coplanar forces using Universal Force Table. | 3 | L1, L2, L3 |
| 2 | | Law of Moments (Varignon's Theorem) using Bell Crank Lever | 3 | L1, L2, L3 |
| 3 | | Equilibrium of Simply Supported Beams | 3 | L1, L2, L3 |
| 4 | | Inclined plane (to determine coefficient of friction). | 3 | L1, L2, L3 |
| 5 | | Compound pendulum. | 3 | L1, L2, L3 |
| 6 | | Collision of Elastic Bodies using Law of conservation of momentum | 3 | L1, L2, L3 |
| 7 | Design Experiments | Design of Flywheel. | 3 | L1, L2, L3 |
| 8 | | Design & development of truss. | 3 | L1, L2, L3 |
| 9 | | Finding centroid of a composite plane area. | 3 | L1, L2, L3 |
| 10 | Group Activities | Mini Project | 3 | L1, L2, L3 |
| Total | | | 30 | |

Books and References:

| SN | Title | Authors | Publisher | Edition | Year |
|----|---|-------------------------------|---------------------|--------------|------|
| 1 | Engineering Mechanics | Irving H. Shames | Prentice Hall | 4th Edition, | 2006 |
| 2 | Vector Mechanics for Engineers, Vol I - Statics, Vol II, – Dynamics | F. P. Beer and E. R. Johnston | McGraw Hill. | 9th Edition, | 2011 |
| 3 | Engineering Mechanics | R. C. Hibbler | Pearson Press. | 4th Edition | 2006 |
| 4 | A Text Book of Engineering Mechanics | Bansal R.K | Laxmi Publications. | 6th Edition | 2018 |

Online References:

| Sr. No. | Website Name | URL | Module |
|---------|--------------|---|---------|
| 1 | MIT | http://web.mit.edu/4.441/1_lectures/1_lecture7/1_lecture7.html | M1 & M2 |
| 2 | BRITANNICA | https://www.britannica.com/technology/tower | M3 & M4 |
| 3 | OCW-MIT | https://ocw.mit.edu/courses/mechanical-engineering/2-003j-dynamics-and-control-i-spring-2007/lecture-notes/lec08.pdf | M5 & M6 |

F.E./F.T. Semester -I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E./ F.T (SEM: I) | | | | |
|---|-----------------|------------------|----------------------|----------------|--|-----------|----------------------------|-----------------------|--------------|
| Course Name: Workshop & Manufacturing Practices -I | | | | | Course Code: ESC1203 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment / Evaluation | | | | |
| Hours Per Week | | | | | Theory (00) | | Practical/Oral (25) | Term Work (00) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credits | ISE | IE | ESE | PR | TW |
| - | - | 2 | 2 | 1 | - | - | - | 25 | - |
| The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) | | | | | | | | | |
| Prerequisite: Basic knowledge of Manufacturing Techniques | | | | | | | | | |

Course Objective: In this a course that provides an understanding of electrical engineering fundamentals, as well as the basics of programming and building circuits for the Arduino and basic of pc assembly.

Course Outcomes: Upon completion of the course students will be able to:

| Sr. No | Course Outcomes | Cognitive levels of attainment as per Bloom's Taxonomy |
|---------------|---|---|
| CO1 | To understand the architecture of Arduino Uno board and Arduino programming. | L1, L2 |
| CO2 | To program and construct applications using a number of different sensors, actuators and communication media. | L1, L2 |
| CO3 | To provide brief overview of different IOT based systems and physical applications. | L1, L2 |
| CO4 | To learn about component of PC and their functions. | L1, L2 |
| CO5 | To learn about process of assembly and disassembly of desktop. | L1, L2 |
| CO6 | To learn about the different network topologies and their functions. | L1, L2 |

Suggested List of Practical/ Experiments:

| Practical Number | Practical/ Experiment Topic | Hrs. | Cognitive levels of attainment as per Bloom's Taxonomy |
|-------------------------|---|-------------|---|
| 1 | IoT Using Arduino: Introduction i) Arduino UNO Board ii) Application iii) Advantages & disadvantages | 02 | L1, L2 |
| 2 | Basic Programmes using LEDs i) LED Blinking ii) RGB Light iii) LED Brightness Control | 02 | L1, L2, L3 |
| 3 | House wiring, staircase wiring and Automated Street Lighting using Arduino | 02 | L1, L2, L3 |
| 4 | Different Sensors & their functions along with their applications | 02 | L1, L2, L3 |
| 5 | Different Actuators & their functions along with their applications | 02 | L1, L2, L3 |
| 6 | Speed Control of Stepper Motor | 02 | L1, L2 |
| 7 | Speed Control of Servo Motor | 02 | L1, L2, L3 |
| 8 | Demonstration of 3D Printing | 02 | L1, L2 |
| 9 | Dismantling and Identification of components of computer (PC). | 04 | L1, L2, L3 |
| 10 | Assembling of PC Installation of Operating System. | 04 | L1, L2 |
| 11 | Application Software & Maintenance. | 04 | L1, L2, L3 |
| 12 | Identification of Network Components. | 04 | L1, L2, L3 |
| Total | | 34 | |

Books and References:

| SN | Title | Authors | Publisher | Edition | Year |
|-----------|----------------------------------|----------------------------------|---------------------------------|-------------------------|-------------|
| 1. | Arduino For Dummies | John Boxall | John Wiley & Sons | 2nd edition | May 2013 |
| 2. | Getting Started with Arduino | Massimo Banzi, Michael Shiloh | O'Reilly Media, Incorporated | 2nd edition | May 2015 |
| 3. | Programming Arduino | Simon Monk | McGraw Hill TAB | 2nd edition | June 2016 |
| 4. | Build a computer from scratch | Jeff Heaton | Heaton Research | 5 th edition | July 2006 |
| 5. | Business Application of computer | Oka | M.M. | 7 th edition | May 2018 |
| 6. | CompTIA Network | Mike Meyers | M.C.Graw Hill | 7 th edition | July 2018 |

Online References:

| Sr. No. | Website Name | URL |
|--------------------|---------------------------------|---|
| 1 | Arduino | https://www.arduino.cc/en/Tutorial/HomePage |
| 2 | Spoken-tutorial | https://spoken-tutorial.org/tutorial-search/?search_foss=Arduino&search_language=English |
| 3 | Assemble and Disassemble the PC | https://ncert.nic.in/vocational/pdf/keit104.pdf |
| 4 | Software Management | https://www.uobabylon.edu.iq/eprints/publication_12_13193_1244.pdf |
| 5 | Computer Networks | https://courses.cs.washington.edu/courses/cse461/21wi/slides/3-components+protocols.pdf |

F.E./F.T Semester -I

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E. (SEM: I) | | | | |
|--|----------|-----------|---------------|---------|--|----|----------------------------|----------------------|-------|
| Course Name: Introduction to Indian Knowledge System | | | | | Course Code: HSMC1201 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment/ Evaluation | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/ Oral (25) | Term Work (00) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credits | ISE | IE | ESE | OR | TW |
| 2 | - | 2 | 4 | 3 | 20 | 20 | 60 | 25 | - |
| ISA: In-Semester Examination- Paper Duration – 1 Hours ESE: End Semester Examination - Paper Duration - 2 Hours The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) | | | | | | | | | |

Prerequisite- History, Value Education, Moral Science

Course Objective: The course aims at imparting basic principles of thought process, reasoning, and inferencing with a focus on sustainability as the core of Indian Traditional Knowledge Systems connecting society and nature. It also aims to introduce the students to all aspects of IKS which are related to their fields of study and to promote interest in knowing and exploring more.

Course Outcomes: Upon completion of the course students will be able to:

| Sr. No. | Course Outcomes | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|---------|--|--|
| 1 | Develop knowledge of Bharatavarsha in classical and medieval India. | L1, L2, L3 |
| 2 | Develop knowledge of the Vedangas and Indian Health Sciences | L1, L2, L3 |
| 3 | Understand and analyze Indian Language Sciences and Indian Mathematics | L1, L2, L3 |
| 4 | Correlate and develop an understanding of the Indian Knowledge System | L1, L2, L3 |
| 5 | Understand the role and position of women in traditional and modern Indian society | L1, L2, L3 |
| 6 | Develop the knowledge of Globalization and growth of India Economy since Independence. | L1, L2, L3 |

Detailed Syllabus (Total No. of Hours: 30):

| Module No. | Topics | Hrs. | Cognitive Levels of Attainment as per Revised Bloom's Taxonomy |
|-------------------|---|-------------|---|
| 1 | Bharatavarsha—A Land of Rare Natural Endowments <ul style="list-style-type: none"> 1.1 The idea of Bharatavarsha 1.2 A Land of Rare Natural Endowments 1.3 The Vedic Corpus. The Itihasas— Ramayana and Mahabharata, and their important regional versions. 1.4 The Puranas & Upanishads 1.5 Earlier Buddhist writings- Abhidhamma Pitaka, Vinaya Pitaka, Sutta Pitaka 1.6 Important Indian ancient Sanskrit literary work- Vikramovasiyam and Mricchakatika. 1.7 Sangham Literature (Art & Culture) | 5 | L1, L2, L3 |
| 2 | The Vedangas and Indian Health Sciences <ul style="list-style-type: none"> 2.1 The six Vedangas — Siksha, Vyakarana, Chandas, Nirukta, Jyotisha and Kalpa. 2.2 Indian Astronomy & Indian Health Sciences: Ancient records of the observation of the motion of celestial bodies in the Vedic corpus. 2.3 Ancient Indian Medicine 2.4 Vedic Foundations of Ayurveda 2.5 Basic Concepts of Ayurveda. 2.6 Yoga and Holistic Health Care 2.7 Important Texts of Ayurveda: Selected extracts from Astāngahrdaya (selections from Sūtrasthāna) and Suśruta-Samhitā (sections on plastic surgery, cataract surgery and anal fistula). The large pharmacopeia of Ayurveda. 2.8 Charaka and Sushruta on the qualities of a Vaidya 2.9 Ayurveda in 18/19th centuries | 09 | L1, L2, L3 |
| 3 | Indian Language Sciences and Indian Mathematics <ul style="list-style-type: none"> 3.1 Language Sciences and the preservation of the Vedic Corpus: Origin of Varnamala of Indian languages 3.2 Word formation in Sanskrit and Indian languages: Basic purpose of the Science of Vyakarana as established by Panini. 3.3 Important texts of Indian Language Sciences: Siksha or phonetics, Nirukta or etymology, Vyakarana or Grammar, Chandas or Prosody. 3.4 Indian Language Sciences in the 18//19 the centuries 3.5 Classical Literature in Sanskrit and Other Indian Languages: The nature and purpose of Kavya. Drisya and Sravya Kavyas. 3.6 Indian Mathematics: Introductory Overview 3.7 Mathematics in the Vedas and Sulva Sūtras 3.8 Mathematics in the Jaina Texts 3.9 development of Place Value System | 09 | L1, L2,L3 |

| | | | |
|---|--|----|------------|
| | | | |
| 4 | Indian Knowledge System 4.1 Indian Education: Preservation of culture, tradition, and Dharma through education. 4.2 The Purpose of Knowledge in India 4.3 Methodology of the Indian Knowledge System: Systematization of knowledge fields as Sastra. 4.4 The importance of Pratyaksha and Agama in relation to Anumana 4.5 Indian Architecture and Town Planning: The importance of Sthapatya-Veda. The ancient cities of the Indus Saraswati region. Town planning and drainage systems 4.6 Examples of the significance of architecture and materials in Ramayana and Mahabharata 4.7 Indian Fine Arts: Basic concepts of Indian music and dance 4.8 Indian Agriculture | 08 | L1, L2, L3 |
| 5 | Women in Indian society 5.1 The role and position of women in Hindu civilization; Gleanings from the Vedas 5.2 Brihadarnyaka Upanishad 5.3 Saptasati Devi Mahatmyam 5.4 Ramayana, Mahabharata, Manusmriti, 5.5 Kautilya's Arthashastra and Mrichchhakatikam of Sudraka | 05 | L1, L2, L3 |
| 6 | Modern India 6.1 The national movement for freedom and social emancipation 6.2 Swami Vivekananda, Sri Aurobindo, Rabindranath Tagore 6.3 Understanding Mahatma Gandhi; A new nation is born as a republic – the pangs of birth and growth. 6.4 India since Independence – the saga of socio-political movements. 6.5 Problems facing the nation today. 6.6 Globalization and Indian Economy 6.7 Bharatavarsha today and the way ahead 6.8 Regeneration of Indian National Resources. | 8 | L1, L2, L3 |

Books and References:

| Sr. No | Name of the Book | Name of the Author | Publisher | Edition | Year of Publication |
|--------|--|--|--------------------------------|--------------|---------------------|
| 1 | Cultural Heritage of India-course material | V. Sivaramakrishnan | Bhartiya VidyaBhavan | 5th Edition, | 2014 |
| 2 | History of Astronomy in India, | S. N. Sen and K. S. Shukla | INSA, Delhi | 2nd Edition, | 2001 |
| 3 | Indian Astronomy: An Introduction | S. Balachandra Rao, | Universities Press, Hyderabad, | - | 2000 |
| 4 | History of Astronomy: A Handbook, | Ramasubramanian, R. (Ed.). Sule, Aniket (Ed.) Vahia, Mayank | Mumbai TIFR | - | 2016 |

| | | | | | |
|---|--|-----------|-------------------------------|---|------|
| | (Ed.). | | | | |
| 5 | Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, | Dharampal | New Quest Publications, Pune, | - | 1987 |

Online References:

| Sr. No. | Website Name | URL | Modules Covered |
|---------|---------------------------|---|-----------------|
| 1 | Glimpses of Eternal India | https://frontline.thehindu.com/arts-and-culture/art/article30192593.ece | M 1-M 6 |
| 2 | History of Modern India | https://www.jagranjosh.com/general-knowledge/history-of-modern-india-a-complete-study-material-1464334160-1 | M 1-M 6 |
| 3 | Modern Indian | https://byjus.com/free-ias-prep/modern-history-ncert-notes/ | M 1-M 6 |

F.E./F.T Semester -I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT/ MECH / E&TC / M&ME) / B.Tech. (AI&ML) | | | | | F.E. (SEM: I) | | | | |
|---|----------|-----------|---------------|------------|--|----|----------------------------|----------------------|-------|
| Course Name: Attitude and Aptitude Development- I | | | | | Course Code: MC1201 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment/ Evaluation | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/ Oral (25) | Term Work (00) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credit s | ISE | IE | ESE | OR | TW |
| 1 | - | - | 1 | Non-Credit | | | | | 25 |

The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)

Prerequisite- Basic knowledge of English language, Grammar and Vocabulary

Course Objective: The course will be able to Enhance the Attitude, Aptitude, and Logical Level of the Students up to their Potentials.

Course Outcomes: Upon completion of the course students will be able to:

| Sr. No. | Course Outcomes | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|---------|---|--|
| 1 | Learn More about Life Skills. | L1, L2, L3 |
| 2 | Motivate to improve the Confidence Level of Himself and Others | L1, L2, L3 |
| 3 | Evaluate Himself Through the Proper Point of View | L1, L2 |
| 4 | Prepare For Recruitment Process from Aptitude Skills Perspective | L1, L2, L3 |
| 5 | Attempt Various Sections of Aptitude Like Quantitative Abilities, Verbal Aptitude and Logical Reasoning in Various Competitive Examinations | L1, L2 |
| 6 | Enhance The Computational Skills for The Recruitment Process. | L1, L2, L3 |

Detailed Syllabus (Total No. of Hours: 15):

| Module No. | Topics | Hrs. | Cognitive Levels of Attainment as per Revised Bloom's Taxonomy |
|-------------------|--|-------------|---|
| 1 | Introduction to Personality Development 1.1 Concept and Meaning of Personality. 1.2 Significance of Personality Development. 1.3 Dimensions of theories of Freud & Erickson. 1.4 The concept of success and SWOT analysis. | 02 | L1, L2, L3 |
| 2 | Attitude & Motivation 2.1 Attitudes: Concept, Significance, and Types of Attitudes. 2.2 Factors affecting attitude, Ways to develop a positive attitude. 2.3 Motivation: Concept, Internal and external motives, 2.4 Importance of self-motivation, and Factors impacting motivation. | 02 | L1, L2, L3 |
| 3 | Self-Esteem 3.1 Self-esteem: Symptoms, and Advantages. 3.2 Dos and Don'ts to develop self-esteem. 3.3 High Self-Esteem 3.4 Low Self-Esteem | 02 | L1, L2 |
| 4 | Quantitative Aptitude-I 4.1 Number System, Numbers, & Ages. 4.2 Averages, Ratios, & Proportions. 4.3 Percentages. 4.4 Mixtures & Allegations. | 04 | L1, L2, L3 |
| 5 | Logical Reasoning Ability-I 5.1 Directions, and Blood Relations. 5.2 Coding & Decoding. 5.3 Letter Series, and Number Series. 5.4 Analogies, and Cubes. 5.5 Logical Deductions, and Venn Diagrams. 5.6 Assumption, Inferences, and Arguments. | 03 | L1, L2 |
| 6 | Verbal Reasoning -I 6.1 Para Jumbles. 6.2 Reading Comprehension. 6.3 Vocabulary, Synonym, Antonyms, Analogies. 6.4 Grammar: Nouns, Articles, Pronouns, etc. | 02 | L1, L2, L3 |

Books and References:

| Sr. No | Name of the Book | Name of the Author | Publisher | Edition | Year of Publication |
|--------|--|--------------------|-----------|---------|---------------------|
| 1 | Quantitative Aptitude for Competitive Examinations | R.S. Aggarwal | S. Chand | ----- | ----- |
| 2 | A Modern Approach to Verbal & Non-Verbal Reasoning | R.S. Aggarwal | S. Chand | ----- | ----- |
| 3 | A Modern Approach to Logical Reasoning | R.S. Aggarwal | S. Chand | ----- | ----- |
| 4 | Puzzles to Puzzle You | Shakuntala Devi | Orient | ----- | 2005 |

Online References:

| Sr. No. | Website Name | URL | Modules Covered |
|---------|-----------------------------|---|-----------------|
| 1 | NPTEL | https://onlinecourses.nptel.ac.in/noc22_hs77/preview | M 1-M 2 |
| 2 | www.indiabix.com | https://www.indiabix.com/verbal-ability/questions-and-answers/ | M 3 |
| 3 | Management Assessment Tests | https://www.practiceaptitudetests.com/industry/management/ | M 4, 5, 6 |

F.E./F.T Semester -I
Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (MECH / E&TC / M&ME) | | | | | F.E. (SEM: I) | | | | |
|--|-----------------|------------------|----------------------|-----------------|---|-----------|-------------------------------------|-------------------------------|--------------|
| Course Name: Professional Skill I (Object Oriented Programming) | | | | | Course Code: HME-PS1201 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment/ Evaluation | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/ Oral (25) | Term Work (00) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credit s | ISE | IE | ESE | OR | TW |
| - | - | 2 | 2 | 1 | - | - | - | - | 25 |
| The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%) | | | | | | | | | |
| Prerequisite- Basic knowledge of English language, Grammar and Vocabulary | | | | | | | | | |

Course Objective: The course will be able to Enhance the software designing and implementation of the java. It introduce object oriented design techniques and problem solving

Course Outcomes: Upon completion of the course students will be able to:

| Sr. No. | Course Outcomes | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|----------------|--|---|
| 1 | Students will able to use an integrated development environment to write, compile, run , and test the object oriented java program | L1, L2,L3 |
| 2 | Students will able to read and make modification to java program that solve real world problems. | , L2,L3 |
| 3 | Understand and apply primitive data types in Java Programming | L1, L2,L3 |
| 4 | Students will able to identify and fix defects and common security issues in codes | L1,L3 |
| 5 | Students will able to validate input in java program | L2,L3 |
| 6 | Students will able to use version control system to track source code in project. | L1, L3 |

Detailed Syllabus

| Unit | Details | Hrs. |
|-------------|---|-------------|
| I | Introduction: History, architecture and its components, Java Class File, Java Runtime Environment, The Java Virtual Machine, JVM Components, The Java API, java platform, java development kit Data types: primitive data types, operators and properties of operators, Arithmetic operators, assignment operators, increment and decrement operator, relational operator, logical operator, bitwise operator, conditional operator. | 02 |
| II | Control Flow Statements: The If...Else If...Else Statement, The Switch...Case Statement Iterations: The While Loop, The Do ... While Loop, The For Loop, The Foreach Loop, Labeled Statements | 02 |
| III | Classes: Types of Classes, Scope Rules, Access Modifier, Instantiating Objects From A Class, Initializing The Class Object And Its Attributes, Class Methods, Accessing A Method, Method Returning A Value. | 02 |
| IV | Inheritance: Derived Class Objects, Inheritance and Access Control, Default Base Class Constructors, this and super keywords. Abstract Classes And Interfaces, Packages: Creating Packages, Default Package, Importing Packages, Using A Package. | 02 |
| V | Enumerations, Arrays: Two Dimensional Arrays, Multi-Dimensional Arrays, Vectors, Adding Elements To A Vector, Accessing Vector Elements, Searching For Elements In A Vector, Working With The Sizeof The Vector. Byte streams: reading console input, writing console output, reading file, writing file, writing binary data, reading binary data, getting started with character streams, writing file, reading file | 02 |
| VI | Abstract Window Toolkit: Window Fundamentals, Component, Container, Panel, Window, Frame, Canvas. Components – Labels, Buttons, Check Boxes, Radio Buttons, Choice Menus, Text Fields, Text, Scrolling List, Scrollbars, Panels, Frames Layouts: Flow Layout, Grid Layout, Border Layout, Card Layout. | 02 |

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2023)

| B.E (IT)/B.TECH (AI&ML) | | | | | F.E. (SEM: I) | | | | |
|---|----------|-----------|------------------|-------------|--|----|----------------------------|----------------------|-------|
| Course Name: Professional Skill I (Object Oriented Programming) | | | | | Course Code: HME-PS1201 | | | | |
| Teaching Scheme (Program Specific) | | | | | Examination Scheme (Formative/ Summative) | | | | |
| Modes of Teaching / Learning / Weightage | | | | | Modes of Continuous Assessment/ Evaluation | | | | |
| Hours Per Week | | | | | Theory (100) | | Practical/ Oral (25) | Term Work (00) | Total |
| Theory | Tutorial | Practical | Contact Hours | Credit s | ISE | IE | ESE | OR | TW |
| - | - | 2 | 2 | 1 | - | - | - | - | 25 |

The weightage of marks for continuous evaluation of Term work/ Report: Formative (40%), Timely completion of practical (40%) and Attendance/Learning Attitude (20%)

Prerequisite- Basic knowledge of English language, Grammar and Vocabulary

Course Objective: The course will be able to Enhance the software designing and implementation of the java. It introduce object oriented design techniques and problem solving

Course Outcomes: Upon completion of the course students will be able to:

| Sr. No. | Course Outcomes | Cognitive Levels of Attainment as per Bloom's Taxonomy |
|------------|--|--|
| 1 | Students will able to use an integrated development environment to write, compile, run , and test the object oriented java program | L1, L2,L3 |
| 2 | Students will able to read and make modification to java program that solve real world problems. | , L2,L3 |
| 3 | Understand and apply primitive data types in Java Programming | L1, L2,L3 |
| 4 | Students will able to identify and fix defects and common security issues in codes | L1,L3 |
| 5 | Students will able to validate input in java program | L2,L3 |
| 6 | Students will able to use version control system to track source code in project. | L1, L3 |

Detailed Syllabus

| Unit | Details | Hrs. |
|------|--|------|
| I | Introduction: History, architecture and its components, Java Class File, Java Runtime Environment, The Java Virtual Machine, JVM Components, The Java API, java platform, java development kit, Lambda Expressions, Methods References, Type Annotations, MethodParameter Reflection, setting the path environment variable, Java Compiler And Interpreter, java programs, java applications, main(), public, static, void, string[] args, statements, white space, case sensitivity, identifiers, keywords, comments, braces and code blocks, variables, variable name | 02 |
| II | Data types: primitive data types, Object Reference Types, Strings, Auto boxing, operators and properties of operators, Arithmetic operators, assignment operators, increment and decrement operator, relational operator, logical operator, bitwise operator, conditional operator. | 02 |
| III | Control Flow Statements: The If...Else If...Else Statement, TheSwitch...Case Statement Iterations: The While Loop, The Do ... While Loop, The For Loop, The Foreach Loop, Labeled Statements, The Break And ContinueStatements, The Return Statement Classes: Types of Classes, Scope Rules, Access Modifier, InstantiatingObjects From A Class, Initializing The Class Object And Its Attributes,Class Methods, Accessing A Method, Method Returning A Value, Method's Arguments, Method Overloading | 02 |
| IV | Inheritance: Derived Class Objects, Inheritance and Access Control, Default Base Class Constructors, this and super keywords. Abstract Classes And Interfaces, Abstract Classes, Abstract Methods, Interfaces Packages: Creating Packages, Default Package, Importing Packages, Using A Package. | 02 |
| V | Enumerations, Arrays: Two Dimensional Arrays, Multi-Dimensional Arrays, Vectors, Adding Elements To A Vector, Accessing Vector Elements, Searching For Elements In A Vector, Working With The Sizeof The Vector. Multithreading: the thread control methods, thread life cycle, the mainthread. Exceptions: Catching Java Exceptions, Catching Run-Time Exceptions, Handling Multiple Exceptions Byte streams: reading console input, writing console output, reading file, writing file, writing binary data, reading binary data, getting startedwith character streams, writing file, reading file | 02 |

| | | |
|-----------|---|-----------|
| VI | <p>Event Handling: Delegation Event Model, Events, Event classes, Event listener interfaces, Using delegation event model, adapter classes and inner classes.</p> <p>Abstract Window Toolkit: Window Fundamentals, Component, Container, Panel, Window, Frame, Canvas. Components – Labels, Buttons, Check Boxes, Radio Buttons, Choice Menus, Text Fields, Text, Scrolling List, Scrollbars, Panels, Frames</p> <p>Layouts: Flow Layout, Grid Layout, Border Layout, Card Layout.</p> | 02 |
|-----------|---|-----------|

Books and References:

| Sr. No | Name of the Book | Name of the Author | Publisher | Edition | Year of Publication |
|--------|--------------------------|--------------------------------|----------------------------|--------------------------|---------------------|
| 1 | Practical English Usage | Michael Swan | OUP | 4th Edition | 1995 |
| 2 | Remedial English Grammar | F.T. Wood | Macmillan | 2014 Edition | 2007 |
| 3 | On Writing Well | William Zinsser | Harper Resource Book | 25th Anniversary Edition | 2001 |
| 4 | Study Writing | Liz Hamp- Lyons and Ben Heasly | Cambridge University Press | 2nd Edition | 2006 |

Online References:

| Sr. No. | Website Name | URL | Modules Covered |
|---------|--------------|---|-----------------|
| 1 | Coursera | https://www.coursera.org/learn/speak-english-professionally | M 1-M 6 |
| 2 | NPTEL | https://nptel.ac.in/courses/109/106/109106129/ | M 1-M 6 |
| 3 | NPTEL | https://nptel.ac.in/courses/109/106/109106094/ | M 1-M 6 |