



**SCHEME OF EXAMINATION
&
DETAILED SYLLABUS**

**BACHELOR OF ENGINEERING
Computer Science & Engineering (CSE)
Sem-I to II**

2015



Bhopal-Chiklod Road, Near Bangrasia Chouraha,
Vill-Mendua, Distt-Raisen(Madhya Pradesh), Ph:07480-295707
e-mail-info@aisectuniversity.ac.in website: www.aisectuniversity.ac.in

Credit Based Grading System

Grade	% Marks range (based on absolute marks)	Grade Point	Description of performance
A+	91-100	10	Outstanding
A	81-90	9	Excellent
B+	71-80	8	Very Good
B	61-70	7	Good
C+	51-60	6	Average
C	41-50	5	Satisfactory
D	31-40	4	Marginal
F	30 & below	0	Fail
I		0	Incomplete.
W		0	Withdrawal

1. The Semester Grade Points Average (SGPA) and Cumulative Grade Point Average (CGPA) shall be calculated as under:

$$SGPA = \frac{\sum_{i=1}^n c_i p_i}{\sum_{i=1}^n c_i}$$

Where C_i is the number of credits offered in the i^{th} subject of a Semester for which SGPA is to be calculated, P_i is the corresponding grade point earned in the i^{th} subject, where $i = 1, 2, \dots, n$, are the number of subjects in that semester.

$$CGPA = \frac{\sum_{j=1}^m SG_j NC_j}{\sum_{j=1}^m NC_j}$$

here NC_j is the number of total credits offered in the j^{th} semester, SG_j is the SGPA earned in the j^{th} semester, where $j = 1, 2, \dots, m$, are the number of semesters in that course.

Equivalence of CGPA to division will be on following basis

CGPA Score	Divisions
$7.5 \leq \text{CGPA}$	First Division With Honours
$6.5 \leq \text{CGPA} < 7.5$	First Division
$5.0 \leq \text{CGPA} < 6.5$	II Division
$\text{CGPA} < 5.0$	Fail

The conversion from grade to an equivalent percentage in a given academic program shall be according to the following formula applicable.

$$\text{Percentage marks scored} = \frac{\text{CGPA}^{\text{Obtained}}}{10} \times 100$$

AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: Mathematics

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBMA-101	Mathematics -I	4(3-1-0)	50	20	30	-	-	100	3 hr	-

COURSE OBJECTIVE:

The objective of this foundational course is to review mathematical concepts already learnt in higher secondary. This course will also introduce fundamentals of mathematical functions, derivatives and aspects of calculus to students.

Syllabus

UNIT-I

Recapitulation of Mathematics: Basics of Differentiation, Rolle's and Lagranges Theorem, Tangents and Normals, Indefinite Integral (Substitution, Integration using Trigonometric Identity & Integration by Parts & Definite Integral).

UNIT-II

Ordinary Derivatives & Applications: Expansion of functions by Maclaurin's & Taylor's Theorem (One Variable), Maxima and Minima of functions of two variables, Curvature (Radius, Center & Circle of Curvature for Cartesian Coordinates), Curve Tracing.

UNIT-III

Partial Derivatives & Applications: Definition, Euler's Theorem for Homogeneous Functions, Differentiation of Implicit Functions, Total Differential Coefficient, Transformations of Independent Variables, Jacobians, Approximation of Errors.

UNIT-IV

Integral Calculus: Definite Integrals as a Limit of Sum, Application in Summation of series, Beta and Gamma functions (Definitions, Relation between Beta and Gamma functions, Duplication formula, Applications of Beta & Gama Functions).

UNIT-V

Applications of Integral Calculus: Multiple Integral (Double & Triple Integrals), Change of Variables, Change the Order of Integration, Applications of Multiple Integral in Area, Volume, Surfaces & Volume of Solid of Revolution about X-Axis & Y-Axis.

OUTCOMES: This course helps the students to gain knowledge and understanding of advanced mathematical functions including integral and differential calculus.

REFERENCES:

1. Michael Greenberg, Advanced Engineering Mathematics, Second Edition, Pearson Education, 2002 (Indian Edition).
 2. B.V. Rammana, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company, 2007. Potter, Goldberg & Edward, Advanced Engineering Mathematics, Oxford University Press.
 3. S. S. Shastry, Engineering Mathematics, PHI Learning
 4. C.B. Gupta, Engineering Mathematics I & II, McGraw Hill India, 2015
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AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: Physics

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBPH-101	Physics	4(2-1-1)	50	20	30	25	25	150	3 hr	2hr

Course Objectives:

The objectives of the course includes educating the students with basic laws of physics and their applications in engineering and technology; and also to develop scientific temper and analytical capability.

Syllabus

UNIT-I

Elasto-dynamics: Simple Harmonic Motion, Electric Flux, displacement vector, Columb law, Gradient, Divergence, Curl, Gauss Theorem, Stokes theorem, Gauss law in dielectrics, Maxwell's equation: Integral & Differential form in free space, isotropic dielectric medium.

Lasers: Properties of lasers, types of lasers, derivation of Einstein A & B Coefficients, Working He-Ne and Ruby lasers.

UNIT-II

Fibre Optics: Light guidance through optical fibre, types of fibre, numerical aperture, V-Number, Fibre dispersion (through ray theory in step index fibre), block diagram of fibre optic communication system.

UNIT-III

Quantum Mechanics: Black body radiation, ultraviolet catastrophe, Crompton effect, plates theory of radiation, phase and group velocity, particle in a box, uncertainty principle, well-behaved wave equation, Schrodinger equation, application to particle in a box.

UNIT-IV

Optics: Interference, division of amplitude & division of wave front, young's double slit experiment, thin film interference, Newton Ring Experiment. Diffraction: Difference between interference and diffraction, types of diffraction, single slit, double slit & n-slit diffraction, Resolving power of grating.

UNIT-V

Semiconductors: Crystalline and Amorphous solids, Band theory of solids, mobility and carrier concentrations, properties of P-N junction, Energy bands, hall effect, VI characteristics of photodiode, zener diode and photovoltaic cell

Nuclear Physics: Nuclear composition, mass defect, binding energy, nuclear force, liquid drop model, elementary idea about nuclear fission and fusion.

LIST OF EXPERIMENTS:

Experiments as suggested by the course coordinator.

COURSE OUTCOME

After completion of the course the students will have a fundamental understanding of basic physics concepts and its applications in a day to day life, demonstrate the knowledge in ultrasonic applications and its importance and explain the utilizations of the electron beams in modern technologies such as CRT, CRO, etc. They will be able to explain the basic understanding of the matter, crystal structure and its fundamental properties including crystal systems and Miller indices and show their understanding of the conductivity nature of metals and the classification of the solids learned from the Band Theory of Solids. They also able to understand the widely used current technologies such as mobile phones, solar cells for which semiconductor technology is essential. The concept of semiconductors and its wide applications will motivate the students to the currently developing topics.

REFERENCES

A Bezier, Concepts of Modern Physics, McGraw Hills
Ghatak, Optics, McGraw Hills

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AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: English

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBEN-101	English	4(3-0-1)	50	20	30	25	25	150	3 hr	2hr

COURSE OBJECTIVE:

The objective of this foundational course is to develop the second language learners' ability to use the four fundamental language skills – listening, speaking, writing and reading. The objective of this laboratory is to practice English phonetics through audio & visual aids and computer software. It intends to enable student to speak English correctly with confidence.

Syllabus

UNIT-I

Grammar – Applied Grammar and usage, Parts of Speech, Articles, Tenses, Subject-Verb Agreement, Prepositions, Active and Passive Voice, Reported Speech: Direct and Indirect, Sentence Structure, Punctuations.

UNIT-II

Vocabulary Development – Using Dictionaries and Thesaurus, Synonyms, Antonyms, Homophones, One Word Substitution, Affixation: Prefixes & Suffixes, Derivation from root words, Jargon, Scientific Jargon.

UNIT-III

Developing Reading Skills – Reading Comprehension, Process, Active & Passive Reading, Reading Speed Strategies, Benefits of effective reading, note-making, note-taking, Reading comprehension of technical material and SQ3R reading technique.

UNIT-IV

Developing Writing Skills – Planning, Drafting & Editing, Writing with style, right-words selection, writing effective sentences, developing logical paragraphs, art of condensation, précis, essay, technical definition and technical description.

UNIT-V

Business Correspondence – Business Letters, Parts & Layouts of Business Letters, Writing Resume/ Application Calling/ Sending Quotations/ Orders/ Complaints and E-mails.

Topics for the Laboratory:

1. Basic Grammar & Vocabulary Practice (Synonyms, Antonyms, Analogies, Sentence Completion, Correctly Spelt Words, Idioms, Proverbs, Common Errors.
2. Phonetic Symbols, Pronunciations
3. Listening Skills – Including Listening Comprehension
4. Extempore and JAM (Just a Minute Session)
5. Role Play – I
6. Role play – II
7. Body Language
8. Debate
9. Oral Presentation – Preparation & Delivery using Audio – Visual Aids with stress on body language and voice modulations. (Topics to be selected by the Instructor)

COURSE OUTCOME:

The course helps the students to improve their phonetics and improves their writing and speaking skills thereby facilitating more employability opportunities to them.

REFERENCES

1. A.J. Thomson and A.V. Martinet, A Practical English Grammar, Oxford IBH
2. Pub Sanjay Kumarm Pushp Lata, English for Effective Communication, Oxford

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Electronics & Communication Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBEC-101	Fundamentals Of Electronics Engineering	3(1-1-1)	50	20	30	25	25	150	3 hr	2hr

COURSE OBJECTIVE:

The objective of the course is educate the students about the signals and their functions, types of semi conductors and their application, number systems adopted in electronics along with the communication amongst the electronic components.

Syllabus

UNIT-I

SIGNALS: Introduction, Representation of Discrete-time Signals: Graphical Representation, Functional Representation, Tabular Representation, Sequence Representation. Elementary Signals: Unit Step Function, Unit Ramp Function, Unit Parabolic Function, Unit Impulse Function, Sinusoidal Signal, Real Exponential Signal, Complex Exponential Signal, Rectangular Pulse Function, Triangular Pulse Function, Signum Function, Sinc Function, Gaussian Function. Basic Operations on Signals: Time Shifting, Time Reversal, Amplitude Scaling, Time Scaling, Signal Addition, Signal Multiplication. Classification of Signals: Deterministic and Random Signals, Periodic and Non-periodic Signals, Energy and Power Signals, Causal and Non-causal Signals, Even and Odd Signals.

UNIT-II

DIODE AND ITS CIRCUITS: Introduction to Semiconductor theory: Classification of materials- Insulators, conductors and semiconductors and their Energy Bands, Types of semiconductors- Intrinsic, Extrinsic. PN Junction Diode: Biasing and operation of PN Diode, V-I characteristics, Limiting Values of PN Diode, Breakdown in PN Diode, Applications of PN Diode. Zener Diode: V-I Characteristics, Applications of Zener Diode. Rectifier Circuits: PN Diode as a Rectifier, Half Wave Rectifier, Full Wave Rectifier, Full Wave Bridge Rectifier, Clipping Circuits, Clamper Circuits.

UNIT-III

NUMBER SYSTEMS: Introduction, Binary Number System, Octal Number System, Decimal Number System, Hexadecimal System, Conversions: Binary to Decimal conversion and vice-versa, Octal to Decimal Conversion and vice versa, Hexadecimal to Decimal Conversion and vice-versa, Binary to Hexadecimal Conversion and vice-versa, Octal to Decimal and vice-versa,

Octal to Hexadecimal and vice-versa. Complements: One's Complement, Two's Complement, Nine's Complement, Ten's Complement. Binary Arithmetic (addition, subtraction, multiplication, division), Octal Arithmetic, Hexadecimal Arithmetic, Signed Numbers, Floating Numbers, Codes.

UNIT-IV

BOOLEAN ALGEBRA AND LOGIC GATES: Introduction, Definitions, Principle of Duality, Basic Theorems, Applications of Boolean Algebra, Boolean Functions, Complement of Boolean Function. Logic Gates (Symbol, Truth Table, Logic Diagram): And, OR, NOT, NAND, NOR, XOR, XNOR. Universal Gates: NAND Gate and NOR Gate implementation, Realization of other Logic Operations using NAND/NOR. Buffer, Negative and Positive Logic, Mixed Logic.

UNIT-V

COMMUNICATIONS SYSTEMS: Introduction to Communication Systems, Elements of Communication Systems: Transmitter, Channel, Receiver, Noise. IEEE Frequency Spectrum Used in Communication Systems: Frequency Bands, Units of Measurement and Abbreviations, Bandwidth and other Parameters, Spectrum Assignment and Regulation. Need of Modulation, Amplitude Modulation, Frequency Modulation, Communication Media and its Classification: Guided and Unguided Propagation.

COURSE OUTCOME:

After completing the course the students will understand better about the selection of electronic materials and the communication systems selection.

REFERENCES:

1. Hwei P. Hsu, Schaum's Outline of Signals and Systems, McGraw-Hill.
2. A.V. Oppenheim, A.S. Willsky, S Hamid Nawab, Signals and Systems, PHI.
3. A Anand Kumar, Signals and Systems, PHI.
4. Basics of Electronics Engineering, Wiley India Pvt. Ltd.

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Mechanical Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBME-102	Engineering Graphics	4(2-0-2)	50	20	30	25	25	150	3 hr	2hr

COURSE OBJECTIVE:

The course is designed with the objectives of familiarizing the students with the construction of geometrical figures, with the projection of 1D, 2D and 3D elements, with the sectioning of solids and development of surfaces and also to familiarize with the preparation and interpretation of building drawing.

Syllabus

UNIT-I

Projections of Points, Straight Lines and Planes: Types and use of Lines, Lettering & Dimensioning, Various types of projection System, Projection of Points in different quadrants, projections of lines and planes for parallel, perpendicular & inclined to horizontal and vertical reference planes. **Projections Solids and Development of Surfaces:** Cylinder, Cone, Pyramid, & Sphere with axes parallel, perpendicular & inclined to both reference planes.

UNIT-II

Development of surfaces of various solids. Sections of Solids Section planes, Sectional views, True shape of Sections for Prism, Cylinder, Pyramid, and Cone & Sphere. Orthographic Projections of Simple objects and Machine Components like Bolts and Screw.

UNIT-III

Isometric projections: Isometric scales, isometric views of Simple objects.

UNIT-IV

Introduction to computer-aided drafting (CAD): Cartesian and Polar Co-ordinate system, Absolute and Relative Co-ordinates systems; Basic drawing commands: Line, Point, Rectangle, Polygon, Circle, Arc, Ellipse, Polyline; Basic editing Commands: Basic Object Selection Methods, Window and Crossing Window, Erase, Move, Copy, Offset, Fillet, Chamfer, Trim, Extend, Mirror. Display Commands: Zoom, Pan, Redraw, and Regenerate; Simple dimensioning and text, Simple exercises.

UNIT-V

Solid modelling: Basics of 2-D solid modeling.

LIST OF EXPERIMENTS

Drawing for topics covered in the theory as suggested by the course coordinator.

COURSE OUTCOME:

On completion of the course the student will be able to perform free hand sketching of basic geometrical constructions and multiple views of objects. do orthographic projection of lines and plane surfaces; draw projections and solids and development of surfaces; prepare isometric and perspective sections of simple solids; and demonstrate computer aided drafting.

REFERENCES

1. N.D. Bhatt and V.M.Panchal, Engineering Drawing Plane and Solid Geometry, Charotar Publishing House.
2. James leach, AutoCAD 2015 Instructor, SDC Publications.

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Chemistry

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TTBCH-1102	Environmental Sciences.*	2 (1-0-1)*	-	-	50	-	50	100	-	

COURSE OBJECTIVE:

This course introduces students to environment concerns. Students are expected to learn about environment, factors affecting it, environmental ethics and its protection through lectures, presentations, documentaries and field visits.

SYLLABUS

UNIT-I

Introduction: Domestic and Global Environmental concerns, principles of sustainable development, Sustainable agriculture, organic farming, bio-fuels, Threats for sustainability

UNIT-II

Environmental Ethics & Legislations: Enforcement of Environment laws in India – The water act, The Air (Prevention and Control of Pollution) Act, 1981, The Environment (Protection) Act, 1986, Environmental Auditing

UNIT-III

Environmental Pollution: Air Pollution – sources, types of air pollutants, National Ambient Air Quality Standards, Controlling Air Pollution. Water pollution – sources, types of water pollutants, water quality indicators, water quality standards. Soil Pollution - types of soil pollutants: industrial wastes, pesticides, fertilizers and manures, salinity of soil, Controlling Soil Pollution.

UNIT-IV

Environmental Challenges: Local Challenges - Solid Waste – Impact of solid waste on natural resources, Deforestation; Global Challenges - climate change and global warming, Kyoto Protocol, Greenhouse Gases, Ways to reduce Greenhouse gases emissions,

Carbon Footprint, ways to reduce carbon footprint, Carbon Trading.

UNIT-V

Sustainable habitat, industrialisation and urbanization: Concept of Green Building, Volatile Organic Compounds (VOC), GRIHA Rating, LEED Rating, HVAC, Hybrid Car Technology, Industrial ecology, India's renewable energy capacity. *Green Technology & Green Business:* Green Business, Green Computing, E-waste management.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

COURSE OUTCOME:

At the end of the course the students will get the basic knowledge on environmental polluting agents and their control measures.

REFERENCES

- 1.R. Rajagopalan, Environmental Studies, Oxford IBH Pub, 2011.
- 2.Kogent Learning Solutions Inc., Energy, Environment, Ecology and Society, Dreamtech, 2012.
- 3.Rag, R. L, Ramesh, Lekshmi Dinachandran, Introduction to sustainable engineering

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AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: Computer Science & Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS-101	Introduction to Computer Science & Engineering *	2 (1-0-1)*	-	-	-	-	100	100	-	-

COURSE OBJECTIVE

The basic objectives of the course is to introduce the students about the basic concepts of CSE and different programming languages and how to write a program.

SYLLABUS

UNIT-I

CBCS Guidance/ Counselling / Advices, Complete course structure/scheme, Continuous Evaluation System. Relevance & Importance of each subject, Specialization Flow Diagram, Pre-requisite Flow Diagram, Scope of the Branch and Future Avenues.

UNIT-II

Review of Computer Engineering Fundamentals: Definition, Evolution, Classification, Number System, Organization i.e. CPU, register, Bus Architecture, Instruction Set, Memory& Storage Systems, I/O Devices & Application Software

UNIT-III

Computer Science & Engineering Application in: Data Processing, Information Systems, Communication, Interworking, World Wide Web, e-Business, Bio-Informatics, Health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc, Defence.

UNIT-IV

Introduction to flowchart, Algorithm, Categories of Programming Languages, Program Design, What are data structures, Introduction to Programming, Security Threats: Viruses, Worms, Malware, Trojans, Spyware, and anti-spyware software, firewall, internet fraud.

UNIT-V

Overview and idea about good computer magazines, Major Computer Science & Engineering

Journals, Case Studies/ Success Stories of Computer Engineers, Professional Societies and associations, Computing Ethics & Good Practices.

COURSE OUTCOME

After completing the course the students would able to write algorithms for computer programming in

TEXT/ REFERENCES:

1. Subhasis Banerjee, S. Arun Kumar, D. Dubhashi, Introduction to Computer Science,
2. Peter Norton, Computing Fundamentals, McGraw Hill India
3. Peter Norton, Introduction to Computers, TMH
4. Silakari & Rajesh K Shukla, Basic Computer Engineering, Wiley India
- 5 . Kenneth Hoganson, Concepts in Computing , Jones & Bartlett
6. RJ Dromey, How to solve it by computer, Prentice Hall India Series, 2007

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: English

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional	End Sem	Lab Work			
TBEN-102	Communication.*	2 (1-0-1)*	-	-	-	-	100	100	-	-

COURSE OBJECTIVE:

The objective of this course is to help students to acquire reading and writing skills in a self-learning mode.

SYLLABUS

- Students are advised to read at least 3 books (novels, short stories, poems) written in English by authors of Indian origin.
- Genres may range from *Art, Culture, Business, Classics, Psychology, Travel, Science, Sports and Poetry* leaving aside all other genres.
- Students are expected to read actively and critically.
- Each student will have to make a separate choice of books depending upon his/ her interest at the time of course-registration in consultation with the course coordinator.
- Course Coordinator while recommending a book must ensure the book's level to be at least above 10th standard.
- The set of books *must contain at least one book* covering *following themes*:
- Biography or Autobiography of any of the eminent Indian in the field of science, technology, engineering and sports

OR

- Books by Indian Industrialists/ Innovators in the areas of science, technology and engineering
- Any book(s) that is objectionable or is banned by the *Government of Madhya Pradesh* for any reasons whatsoever will not be permitted for the course.
- One book is expected to be read in a period of not more than *20 days* after which students have to submit a *hand-written* review briefing the following aspects:
- Relevance of the book title to the content
- About the main character and other characters

- Setting of the book
- Main Idea/ Theme of the book
- Write précis and make presentation in consultation with the teacher
- Write 3 quotations from the book
- Message of the book and the student take away

COURSE OUTCOME:

After completion of the course the students should be able to speak convincingly, express their opinion clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies. They can also write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing. They can also read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation. They can listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.

REFERENCES

- My Experiments with Truth by Mahatma Gandhi.
- Wings of Fire by Dr. APJ Abdul Kalam.
- History of Everything by Stephen Hawkings
- A Passage to India by E.M. Forster.
- The Argumentative Indian by Amartya Sen.
- The Old Man and the Sea by Ernest Hemingway.
- Life of Pi by William Dalrymple.
- The Alchemist by Paulo Coehlo.
- The Eighth Habbit by Stephen Covey.
- The Road Less Travelled by M.Scott Peck.

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Mathematics

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBMA-201	Mathematics-II	4(3-1-0)	50	20	30	-	-	100	3 hr	-

COURSE OBJECTIVE:

The objective of this foundational course is to review mathematical concepts already learnt in higher secondary. This course deep understanding of matrix, differential equations as well as a strong sense of how useful the subject can be in other disciplines of learning.

Syllabus

UNIT-I

Matrices & Linear Systems: Rank of a Matrix (By reducing it to Elementary Transformation, Echelon & Normal Forms), Solution of Simultaneous equations by Elementary Transformation Methods, Consistency & Inconsistency of Equations, Eigen Values & Eigen Vectors, Cayley-Hamilton Theorem.

UNIT-II

Ordinary Differential Equations-I: First-order differential equations (Separable, Exact, Homogeneous, Linear), Linear differential Equations with constant coefficients.

UNIT-III

Ordinary Differential Equations-II: Homogeneous linear differential equations, Simultaneous linear differential equations. Second-Order Linear Differential Equations with Variable Coefficients: Solution by Method of Undetermined Coefficients, ByS Known Integral, Removal of First Derivative, Change of Independent Variable and Variation of Parameters.

UNIT-IV

Partial Differential Equations-I: Definition, Formulation, Solution of PDE (By Direct Integration Method & Lagranges Method), Non-Linear Partial Differential Equation of First order {Standard I, II, III & IV), Charpit's General Method of Solution Partial Differential equations.

UNIT-V

Partial Differential Equations-II: Partial Differential Equations with Constant Coefficients (Second and Higher Orders Homogeneous and Non- Homogeneous equations), Partial differential Equations Reducible to equations with constant coefficients, The Method of Separation of Variables.

COURSE OUTCOME

The students at the end of the course would be able to solve the complex mathematical equations which have applications in different engineering fields.

REFERENCES:

1. Dean G. Duffy, Advanced Engineering Mathematics with MATLAB, RC Press, 2013.
E.Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc.
 2. Michael Greenberg, Advanced Engineering Mathematics, Second Edition, Pearson Education, 2002 (Indian Edition).
 3. B.V. Rammana, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company, 2007. Shanti Narayan, A Course of Mathematical Analysis. S.Chand & Co. Delhi.
 4. Marwaha, Introduction to Linear Algebra, PHI Learning.
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AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

Department: Chemistry

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCH-101	Chemistry	4(2-1-1)	50	20	30	25	25	150	3hr	2hr

COURSE OBJECTIVE:

The objective of this foundational course is to develop general familiarity and understanding with the following areas in chemistry: inorganic, organic, physical chemistry, electrochemistry, photochemistry and Thermo chemistry. The course also intended to make students work effectively and safely in the laboratory working environment. Last portion of curriculum addresses critical thinking and numerically analyzing the chemical problems.

Syllabus

UNIT-I

Molecular Structure & Bonding: VSEPR Model, Valance-Bond Theory, Molecular Orbital Theory, Molecular Orbital of Polyatomic Molecules. **Electrochemistry:** Arrhenius theory of electrolytic dissociation, Transport Number, Kohlrausch's Law, Solubility Product, Redox Reaction, Electrochemical & Concentration Cells.

UNIT-II

Chemical & Phase Equilibria: Phase Diagram for single component system (Water), Phase diagram for Binary Eutectic System (Copper-Silver), Corrosion of metals in acids, Corrosion by Oxygen, Corrosion by Metal Contact. **Reaction Dynamics:** Order, Molecularity, Rate Law, Methods of determining order of reaction (1st & 2nd Order).

UNIT-III

Polymers & Polymerization: Monomers, Polymers, their classification, thermoplastics & thermosetting with examples, Bio-Polymerization, Bio-Degradable Polymerization, Preparation, Properties & Technical Applications of PVC, PVA, Teflon, Nylon6, & Nylon6:6, Polyester, Phenol-Formaldehyde, Urea-Formaldehyde, Natural & Synthetic Rubber, Vulcanization of Rubber.

UNIT-IV

Photochemistry: Photo-excitation of organic molecules, Jablonski Diagram, Laws of Photochemistry and quantum yield, some examples of photochemical reactions, chemistry of

vision and other applications of photochemistry. **Thermo chemistry:** Fundamental concept of first law, work, heat, energy and enthalpies, relation between C_v & C_p . Second Law: Entropy, Free Energy, (The Helmholtz and Gibbs) and chemical potential.

UNIT-V

Numerical problems based on water analysis and water softening process. Determination of hardness by complexometry, Alkalinity and its determination and their relevant numerical problems, testing of lubricating oils, viscosity and viscosity index, flash & fire point, cloud & pour point, Aniline Point, Carbon Residue, Steam-emulsion number, Neutralization number, Saponification number.

LIST OF EXPERIMENTS

As per suggested by the course coordinator.

COURSE OUTCOME

The knowledge gained on polymer chemistry, thermodynamics. spectroscopy, phase rule and nano materials will provide a strong platform to understand the concepts on these subjects for further learning.

REFERENCES

1. Lee, J. D, Author, Concise Inorganic Chemistry, Oxford University Press Alberty.
2. R. A., Physical Chemistry, John Wiley and Sons.
3. N. Krishnamurthy, P. Vallinayagam, Engineering Chemistry, PHI Learning Pvt. Ltd.
Kuriacose J.C. and Rajaram J., Chemistry in Engineering and Technology, Tata McGraw Hill.

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Computer Science & Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS-202	Fundamentals of Computer Engineering	4(2-0-2)	50	20	30	25	25	150	3 hr	2hr

COURSE OBJECTIVES:

The course is designed to equip the student to use computers for professional as well as day to day use. It provides theoretical background as well as in depth knowledge of application softwares/packages.

Syllabus

UNIT-I

Computer: Definition, classification, Organization i.e. CPU, register, Bus Architecture, Instruction Set, Memory & Storage Systems, I/O Devices, and System and Application Software, Computer Application in e-Business, Bio-Informatics, Health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.

UNIT-II

Operating System: Definition, Function, Types, Management of File, Process & Memory. Introduction to MS Word, MS Power Point, MS Excel. Introduction to algorithm, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS Object Oriented Programming, Introduction to C++: Character Set, Tokens, Precedence and Associativity, Program Structure, Data Types, Variables, Operators, Expressions, Statements and Control Structures, I/O Operations, Array, Functions.

UNIT-III

Object & Classes, Scope Resolution Operator, Constructors & Destructors, Friend Functions, Inheritance, Polymorphism, Overloading Functions & Operators, Types of Inheritance, Virtual Functions, Introduction to Data Structures. Computer Networking: Introduction, Goals, ISO-OSI Model, Functions of different layers. Internet working concepts, Devices, TCP/IP Model, Introduction to Internet, World Wide Web, E-Commerce.

UNIT-IV

Computer Security Basics: Introduction to Viruses, Worms, Malware, Trojans, Spyware, and

Anti-Spyware Software, Different types of attacks like Money Laundering, Information Theft, Email Spoofing, Denial of Services (DoS), Cyber Stalking, Logic Bombs, Hacking, Spamming, Cyber Defamation, Forming Security Measures Firewall, Computer Ethics & Good Practices, Introduction to Cyber Laws about internet fraud, Good Computer Security Habits.

UNIT-V

Database Management System: Introduction, File Oriented Approach and Database approach, Data Models, Architecture of Database System, Data Independence, Data Dictionary, DBA, Primary Key, Data Definition Language and Manipulation Languages. Cloud Computing: Definition, Cloud Infrastructure, Cloud Segments or service delivery models (IaaS, PaaS, SaaS), Cloud deployment models/ types of cloud (public, private, community and hybrid cloud), Pros and Cons of Cloud Computing.

LIST OF EXPERIMENTS:

1. Study and Practice of Internal & External DOS Commands
2. Study and Practice of Basic LINUX Commands – ls, cp, mv, rm, chmod, kill, ps etc.
3. Study and Practice of MS Windows – Folder Related Operations, My Computer, Window-Explorer, Control Panel
4. Creation and Editing of Text Files using MS Office (MS Word)
5. Creation and Operating of Spreadsheet using MS Excel
6. Creation and Editing Power Point Slides using MS Power Point.
7. Creation and Manipulation of Database Tables using SQL in MS Access
8. WAP to illustrate Arithmetic Expressions, Arrays, Functions, Constructor & Destructor, Objects & Classes, Operator Overloading, Function Overloading, Derived Classes & Inheritance,
9. WAP to insert and Delete end Element from the stack
10. WAP to insert and delete end element from the Queue

COURSE OUTCOME

By the end of the course the student is capable of understanding fundamental of computers, identification of different hardware components and converse with different application softwares.

REFERENCES

1. E Balaguruswamy, Fundamentals of Computers, TMH Silakari and Shukla, Basic Computer Engineering, Wiley India V Rajaraman, Fundamentals of Computes, PHI
2. Ajoy Kumar Ray & Tinku Acharya, Information Technology Principles and Application Peter Norton, Introduction to Computers, TMH

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department : Computer Science & Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS-203	Data Structure-I	3(1-1-1)	50	20	30	25	25	150	3hr	2hr

COURSE OBJECTIVES

The salient objectives of the course are to teach the students about efficient storage mechanisms of data for an easy access; to design and implementation of various basic and advanced data structures; to introduce various techniques for representation of the data in the real world; to develop application using data structures; to teach the concept of protection and management of data and to improve the logical ability

Syllabus

UNIT-I

Basic Concept: Data Structure and algorithm preliminaries: Definitions; Data types, Time and Space analysis of Algorithms; Time and space trade-off, Pointers and dynamic memory allocation; Recursion.

UNIT-II

Arrays and Structure: Concepts of Linear Search, Binary Search, Evaluation of Polynomial, Polynomial representation, Polynomial Addition, Structures: Internal representation of structure, Self-referential structure, Array: Definitions of Arrays and Lists, Strings, Row/Column major representation of Arrays.

UNIT-III

Stack and Queues: Introduction to Stack, Static and Dynamic Representation, Operation, Application of Stack, Evaluation of Expression, postfix expression, Infix, prefix, Queue, Static and Dynamic Representation, Operation, Priority Queue, Circular Queue.

UNIT-IV

Linked List and Trees: Introduction to Linked List: Singly linked list, circular linked list, doubly linked list, operations on linked list, Introduction to Tree: Definition, Terminology, Generalised tree representation, Binary tree - definitions and properties, Representation, Binary Tree Traversal In-order, Pre-order, Post-order, Introduction to Binary Search Tree.

UNIT-V

Graphs; Searching & Sorting: Introduction to Graphs: Representation, Adjacency Matrix and List, Indegree, out degree of Graph, Graphs Operation, DFS & BFS, Spanning Tree, Shortest path. Searching and Sorting Methods: Various Searching and Sorting algorithms with complexity analysis.

COURSE OUTCOME:

After completion of the course the students will be able to choose appropriate data structure as applied to specified problem definition; will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures; will be able to apply concepts learned in various do mains like DBMS, compiler construction etc and they will be able to use linear and non-linear data structures like stacks, queues , linked list etc

REFERENCES

1. E Balagurusamy, Data Structures Using C, Tata McGraw Hill Education.
 2. Achuthsankar S. Nair & T. Mahalekshmi, Data Structures in C, PHI.
 3. R. Venkatesan & S. Lovelyn Rose, Data Structures, Wiley India.
 4. Rajesh K. Shukla, Data Structures Using C & C++, Wiley India.
 5. Langsam, Augenstein & Tenenbaum, Data Structures Using C & C++, Pearson
 6. Dharmender Singh Kushwaha & Arun Kumar Mishra Data Structures: A Programming Approach with C, PHI.
 7. Tenebaum, Langsam & Augenstein, Data Structures Using C, Pearson.
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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Mechanical Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted					Duration of Exam.		
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBME-201	Concepts in Engineering Design	3(2-1-0)	50	20	30	-	-	100	3 hr	-

COURSE OBJECTIVE:

The primary objective of the course is to introduce concepts in engineering design to students from all the engineering disciplines. This course broadly covers the prerequisites for an innovative design followed by concepts of products design cycle right from planning, designing, manufacturing, distributing and its usage.

Syllabus

UNIT-I

Introduction to engineering Design process: Its importance, types of designs, various ways to think about design like visualization, photography etc, simplified iteration model, design versus scientific method, a problem solving methodology.

UNIT-II

Considerations of a good design Achievement of performance requirements, Total life cycle, Regulatory and social issues in Indian context

UNIT-III

Description of Design Process Conceptual Design, Embodiment Design, Detail Design, Planning for Manufacture, Planning for distribution, planning for Use, Planning for the retirement of the product.

UNIT-IV

Product Design Cycle, Identification of customer needs and market research essentials, concept generation, technology and market assessment. An exposure to various aspects of design including visual, creative and user-centric design (Visual merchandising, trends, materials, technology and techniques). Evolution in Transportation and Communication Technology, Bullock Cart to Lear Jets, Personal messengers to Cell Phones, Fighter planes.

UNIT-V

Introduction to any one as a case study:

1. Communication Design.
2. Industrial Design.
3. IT Integrated Design.
4. Textile Design.
5. Inter disciplinary Design.

Practicals: To be decided by the course Coordinator.

COURSE OUTCOME

After completion of the course the students would be able to understand the step by step procedure in product design

REFERENCES

1. George E. Dieter and Linda C. Schmidt, Engineering Design, McGraw Hill Education (India) Pvt. Ltd.
2. Arvid Eide, Introduction to Engineering Design, McGraw Hill.
3. Otto. K and Wood, K, Product Design, Pearson Education.

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Mechanical Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBME-202	Manufacturing Practices.*	3 (1-0-2)*	-	-	50	-	50	100	-	

COURSE OBJECTIVE:

The objectives of the course is to familiarize the students with the basics of tools and equipment used in fitting, carpentry, sheet metal, welding and smithy; and also to familiarize them with the production of simple models in the above trades.

Syllabus

UNIT-I

FITTING: Tools & Equipments – Practice in filing. Making Vee Joints, Square, Dovetail joints and Key making - plumbing.

Suggested Mini project – Assembly of simple I.C. engines

UNIT-II

CARPENTRY: Tools and Equipments- Planning practice. Making Half Lap, Dovetail, Mortise & Tenon joints.

Suggested Mini project - model of a single door window frame.

UNIT-III

SHEET METAL: Tools and equipments– practice. Making rectangular tray, hopper, scoop, etc.

Suggested Mini project - Fabrication of a small cabinet, dust bin, etc.

UNIT-IV

Tools and equipments - Arc welding of butt joint, Lap joint, Tee fillet. Demonstration of gas welding, TIG & MIG welding.

UNIT-V

SMITHY: Tools and Equipment – Making simple parts like hexagonal headed bolt, chisel.

FOUNDRY: Tools and Equipment, Mould making, conducting casting operation of a job.

COURSE OUTCOME

By the end of the course student would be able to use all the workshop tools and can develop their own models.

REFERENCES

1. S Hazara Choudhary, Gopal.T.V, Kumar.T, And Murali.G, “A First Course On Workshop Practice – Theory, Practice And Work Book”, Suma Publications, Chennai, 2005
2. Kannaiah.P and Narayanan.K.C, “Manual on Workshop Practice”,Scitech Publications
3. Venkatachalapathy.V.S “First year Engineering Workshop Practice”,Ramalinga Publications.

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Computer Science & Engineering

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBCS-201	Computer Programming.*	3 (2-0-1)*	-	-	-	-	100	100	-	

Syllabus

Unit – I: Introduction to computer

What is computer: Characteristics of Computers, Basic Applications of Computer, and Classifications of computer. Components of Computer System: Central Processing Unit(CPU), Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software. Representation of data/Information, concepts of data processing: Definition of Information and data, Basic data types, Storage of data/Information as files.

Unit – II: Introduction to Windows & DOS

Operating system and basics of Windows. The User Interface: Using Mouse and Moving Icons on the screen, The My Computer Icon, The Recycle Bin, Status Bar, Start and Menu & Menu-selection, running an Application, Windows Explorer Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows. Windows Setting: Control Panels, Wall paper and Screen Savers, Setting the date and Sound, Concept of menu Using Help. Advanced Windows: Using right Button of the Mouse, Creating Short cuts, Basics of Window Setup, Notepad, and Window Accessories. Comparison of DOS and Windows, Switching between DOS and Windows, Basic DOS Commands

Unit – III: Working with MS Word

An Introduction to MS Word, Elements of MS word: The Menu Bar, Using the Help, Using the Icons below menu bar, Opening Documents and Closing documents, Save and Save AS, Page Setup, Printing of Documents, Scrolling the Document by line/paragraph, Fast Scrolling and Moving Pages, Text Creation and Manipulation, Paragraph and Tab Setting, Text Selection, Cut, copy and paste, Font and Size selection, Bold ,Italic and Underline, Alignment of Text: Center, Left, right and Justify, Changing font, Size and Color, Bullets and Numbering, Use of Tab and Tab setting, Changing case, Draw Table, Delete/insertion of row and columns.

Unit – IV: Working with MS Excel and Power Point

Elements of MS Excel: Opening of excel Sheet, The menu bar, Creation and deletion of cells, Cell inputting, Enter texts numbers and dates, Creation of tables, Cell Height and Widths, Copying of cells, Providing Formulas for basic operations. Elements of MS Power Point: Opening a Power Point Presentation, Using Wizard for creating a presentation, Creation of Presentation: Title, Text Creation, Fonts and Sizes, Bullets and indenting, Moving to Next Slide, Selection of type of Slides, Importing text from word documents, Moving to next Slide, The Slide manager, Background and Text colors, Using the Slide Show, Printing the Slides and Handouts.

Unit – V: Introduction to ‘C’ language

Basics of C- language, components of a C program, data types, variables and identifiers, arithmetic operators and expressions, compiling and executing c program, functions and operators, conditional statements and loops, arrays, structures and unions, pointers and file processing.

COURSE OUTCOME

Students would be able to operate Excel and Power point application softwares at ease and also able to start writing basic programmes in C language.

List of Practicals:

01. Study and practice of Internal & External DOS commands.
02. Study and Practice of MS windows – Folder related operations, My-Computer, window explorer, Control Panel.
03. Creation and editing of Text files using MS- word.
04. Creation and operating of spreadsheet using MS-Excel.
05. Creation and editing power-point slides using MS- power point
06. WAP to illustrate Arithmetic expressions in C.
07. WAP to illustrate Arrays in C
8. WAP to illustrate functions in C.
9. WAP to illustrate pointers in C.
10. WAP to illustrate structures and unions.

Reference Books:

1. Fundamentals of Computers : E Balagurusamy, TMH
2. Introduction of Computers : Peter Norton, TMH
3. Kerninghan & Ritchie “The C programming language”, PHI
4. Kanetkar Y. “Let us C”, BPB.

5. Microsoft_Office_2007_Illustrated_Windows_XP_Edition_Introductory by David W. Beskeen, Jennifer Duffy.
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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: Social Science

Subject Code	Subject Name	Credits	Maximum marks Allotted						Duration of Exam.	
			Theory			Practical		Total	Theory	Practical
			Major	Minor	Sessional.	End Sem	Lab Work			
TBSS-201	Rural Outreach.*	3 (0-0-3)*	-	-	-	-	150	150	-	

COURSE OBJECTIVE:

The main objective of introducing this course is to sensitize students about the *socio-cultural* aspects of the rural areas parochial to their colleges.

Syllabus

- This course shall be done by the students in a self-study mode. Study methodology shall comprise of combining field visits, case studies, analyzing policy documents from different government departments, discussions with field officers, active NGO's and so on.
- The course will not be listed in the time-table and its activities shall be performed by the students *at any time* convenient to them.
- The faculty associated with the course shall evaluate the candidate and grade him.
- For evaluation purpose, students are expected to submit a *hand-written summary* on the government schemes and policies for the socio-cultural development of the concerned village. This shall be followed by final submission of two case studies covering broad spectrum of socio-cultural issues ranging from life in slums, infant mortality, watershed management, potability of water, animal welfare etc. These case studies (handwritten) shall be submitted to the mentor for the final evaluation of the coursework.

COURSE OUTCOME

Students are expected to investigate and learn about the demographics, literacy, geographical parameters of the Village; schemes of Government of India and State of Madhya Pradesh in operation in the villages and social and cultural dynamics of villages..

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