

Ist YEAR B.TECH
INTRODUCTION TO BIOTECHNOLOGY
(BT-101 E)

L T P/D
3 1

Theory: 100 marks
Sessional : 50 marks
Total: 150 marks
Time: 3 Hrs.

UNIT - I

Introduction to life: Characteristics of living organisms. Hierarchy of organisation and factors responsible for regulating different levels of organisations. Structure of Prokaryotic and Eukaryotic cell. Basic concept of State and Homeostasis.

Introduction to Biomolecules: Definition, general classification and important functions of carbohydrates, lipids, proteins, nucleic acids and vitamins.

Enzymes as biocatalysts: General characteristics, nomenclature and classification of Enzymes. Effect of temperature, pH, enzyme and substrate concentrations on the activity of enzymes. Elementary concept of cofactors and coenzymes.

UNIT - II

Biodiversity :

- (i) **Plant System :** Basic concepts of plant growth, nutrition, photosynthesis and nitrogen fixation. Types of Growth regulators and their physiological effects.
- (ii) **Animal System :** Elementary Study of Digestive, Respiratory, Circulatory, Excretory systems and their functions.
- (iii) **Microbial System :** History of Microbiology, types of microbes and properties. Economic importance and control of microbes.

UNIT - III

Evolution: Theories of evolution. Mendel's laws of inheritance. Variation and speciation.

Genetic: Cell division – Mitosis and Meiosis. Evidence of nucleic acids as a genetic material. Central Dogma.

Genetic Engineering : Elementary knowledge of Recombinant DNA Technology, Bio-informatics and Genomics.

UNIT – IV

Introduction to Biotechnology : Definition, scope and achievements. Tools used in biotechnology.

Applications of Biotechnology in Agriculture, Medicine and Environment – an elementary knowledge.

Prospects and public perception of Biotechnology.

Text/ Reference Books:

1. Cell Biology and Genetics. 9th edition. Starr, C. and Taggard; R. (2001) Thomson Learning USA.
2. Life Science of Biology 6th edition Purves W.K.; Sadava, D.; Orians, G.H. and Heller, H.C. (2001). W.H. Freeman & company, USA.
3. Basic Biotechnology. Ratledge, C. and Kristiansen, B. (2001) Cambridge University Press.
4. Basic Biotechnology. Ignacimuthu, S.J. (2002) Tata McGraw-Hill Pub., New Delhi
5. Genes VII Lewis Benjamin (2002). Oxford Univ. Press Oxford.
6. Biotechnology 3rd Edition. Smith, J.E. (2003) Cambridge University Press.

ME-101E
ELEMENTS OF MECHANICAL ENGINEERING

L T P
3 1

Theory: 75 marks
Sessional: 25 marks
Total: 100 marks
Time: 3 Hrs.

Unit-I

Properties of Steam & Boilers: Formation of steam at constant pressure, Thermodynamics properties of steam, Condition of steam, Steam tables, Measurement of dryness fraction by throttling calorimeter, Classification of boilers, Comparison of water and fire tube boilers mounting and accessories with their functions, Constructional and operational details of Cochran and Babcock and Wilcox boilers, Problems.

Steam Turbines and Condensers: Classification of turbines, Working principle of impulse and reaction turbine, Compounding of impulse turbine, Comparison of impulse and reaction turbines, Types of condensers, Cooling ponds and cooling towers, Condenser and vacuum efficiencies.

Unit-II

I.C. Engines and Gas Turbines: Introduction, Classification, Constructional details and working of two-stroke and four-stroke diesel and petrol engines, Otto, Diesel and Dual cycles, Working principle of gas turbine, Constant pressure gas turbine cycle.

Water Turbines, Pumps and Hydraulic Devices: Introduction, Classification, Construction details and working of Pelton, Francis and Kaplan turbines, Specific speed and selection of turbines, Classification of water pumps and their working, Hydraulic jack and lift.

Unit-III

Simple Lifting Machines: Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, double and triple start worm and worm wheel, Single and double purchase winch crabs, Simple and compound screw jacks. Problems.

Power Transmission Methods and Devices: Introduction to Power transmission, Belt drive, Rope drive, Chain drive, Pulley, Gear drive, Types of gears, Gear train, Clutches, Types and function of clutches, Types and function of brakes, Power measurement by dynamometer, Types of dynamometers.

Unit-IV

Stresses and Strains: Introduction, Concept & types of Stresses and strains, Poisson's ratio, stresses and strains in simple and compound bars under axial loading, Stress-strain diagrams, Hooke's law, Elastic constants & their relationships, Principle stresses & strains and principal-planes, Mohr's circle of stresses. Numerical problems.

Bending Moment & Shear Force: Definitions, SF and BM diagrams for cantilever and simply supported beam. Calculation of maximum SF, BM and point of contraflexure under the loads of (i) concentrated load (ii) uniformly distributed load (iii) combination of concentrated and uniformly distributed loads. Problems.

Text Books:

1. Strength of Materials - G.H. Ryder, Pub.- ELBS.
2. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi
3. Engineering Thermodynamics – C.P. Arora, Pub. - TMH, New Delhi
4. Thermal Engineering – A.S. Sarad, Pub. - Satya Prakashan, New Delhi.
5. Engineering Mechanics – K.L. Kumar, Pub. - TMH, New Delhi.
6. Theory of Machines – S.S. Rattan, Pub. – TMH, New Delhi.

Reference Books:

1. Strength of Materials – Popov, Pub. - PHI, New Delhi.
2. Hydraulic Machines – Jagdish Lal, Pub.- Metropolitan, Allahbad.
3. Thermal Science and Engineering – D.S. Kumar, Pub. – Kateria & Sons, New Delhi.

ME- 103E
MANUFACTURING PROCESSES

L T P
marks
4

Theory : 100
Sessional : 50 marks
Total: 150 marks
Time: 3 Hrs.

Unit-I

Introduction: Introduction to Manufacturing Processes and their Classification. Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, First Aid.

Engineering Materials: General Properties and Applications of Engineering Materials, Mild Steel, Medium Carbon Steel, High Carbon Steel, High Speed Steel and Cast Iron.

Unit-II

Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern Allowances, Risers, Runners, Gates, Moulding Sand and its composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies.

Unit-III

Cold Working (Sheet Metal Work): Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining Advantages and Limitations.

Hot Working Processes: Introduction to Hot Working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing. Plant Layout, Objectives of Layout, Types of Plant Layout and their Advantages.

Unit-IV

Introduction to Machine Tools: Specifications and Uses of commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal Cutting. Nomenclature of a Single Points Cutting Tool and Tool Wear. Mechanics of Chips Formations, Type of Chips , Use of Coolants in machining.

Welding: Introduction to Welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene Welding, Resistance Welding; Spot and Seam Welding, Arc Welding: Metal Arc, TIG & MIG Welding, Welding Defects and Remedies, Soldering & Brazing.

Text Books :

1. Workshop Technology Vol. I &II - Hazra & Chaudhary, Asian Book Comp., New Delhi.
2. Process and Materials of Manufacture-Lindberg, R.A. Prentice Hall of India, New Delhi.
3. Principles of Manufacturing Materials and Processes- Campbell, J.S.- McGraw- Hill.

Reference Books:

1. Manufacturing Science-Amitabha Ghosh & Ashok Kumar Malik, - East-West Press.
2. Manufacturing Process and Systems - Ostwald, Munoz , John Wiley.
3. Workshop Technology, Vol. 1, 2 & 3 – Chapman, WAJ, Edward Arnold.

CSE -101E
FUNDAMENTALS OF COMPUTERS & PROGRAMMING IN C

L T P
3 2

Theory: 100 marks
Sessional : 50 marks
Total: 150 marks
Time: 3 Hrs.

Unit-1

An Overview of Computer System: Anatomy of a digital Computer, Memory Units, Main and Auxiliary Storage Devices, Input Devices, Output Devices, Classification of Computers. Radix number system: Decimal, Binary, Octal, Hexadecimal numbers and their inter-conversions; Representation of information inside the computers. Operating System Basics: Introduction to PC operating Systems: DOS, Unix/Linux, Windows 2000.

Unit-2

Programming Languages: Machine-, Assembly-, High Level- Language, introduction to Assembler, Compiler, Interpreter, Debuggers, Linker and Loader. Programming fundamentals: problem definition, algorithms, flow charts and their symbols.

Internet basics: How Internet works, Major features of internet, Emails, FTP, Using the internet.

Unit-3

C Programming language: C fundamentals, formatted input/ output, expressions, selection statements, loops and their applications; Basic types, arrays, functions, including recursive functions, program organization: local and external variables and scope & arrays.

Unit-4

Strings: strings literals, string variables, I/O of strings, arrays of strings; applications. Structures, Unions and Enumerations: Structure variables and operations on structures; Structured types, nested array structures; unions; enumeration as integers, tags and types. Standard library: Input / output; streams, file operations, formatted I/O, character I/O, line I/O, block, string I/O, Library support for numbers and character data, error handling:

Text Books:

1. Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
2. The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.
3. C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.

Reference Books:

1. Information technology, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin, 1998, TMH
2. Theory and problem of programming with C, Byron C Gottfried, TMH
3. Teach yourself all about computers by Barry Press and Marcia Press, 2000, IDG Books India.
4. Using Computers and Information by Jack B. Rochester, 1996, Que Education & Training.