

**SYLLABUS PRESCRIBED FOR
FOUR YEAR DEGREE COURSE IN
BACHELOR OF ENGINEERING
INFORMATION TECHNOLOGY
SEMESTER PATTERN
(CREDIT GRADE SYSTEM)
SEMESTER : THIRD**

3 IT 01/3 KS 01 / 3 KE 01 MATHEMATICS-III

SECTION-A

- UNIT-I: Ordinary differential equations:- Complete solution, Operator D, Rules for finding complementary function, the inverse operator, Rules for finding the particular integral, Method of variations of parameters, Cauchy's and Legendre's linear differential equations.
- UNIT-II: Laplace transforms:- definition, standard forms, properties of Laplace transform, inverse Laplace transform, initial and final value theorem, convolution theorem, Laplace transform of impulse function, Unit step function, Laplace transforms of periodic function Solution of Linear differential equations, Simultaneous differential equation by Laplace transform method.
- UNIT-III: a) Difference equation:- solution of difference equations of first order Solution of difference equations of higher order with constant coefficients,
b) Z-transform:- Definition, standard forms, Z-transform of impulse function, Unit step functions, Properties of Z transforms (linearity, shifting, multiplication by k, change of scale), initial and final values, inverse Z-transforms (by direct division and partial fraction), Solution of difference equation by Z-transforms.

SECTION-B

- UNIT-IV: a) Fourier transforms:- Definition, standard forms, inverse Fourier transforms, properties of Fourier transforms, convolution theorem, Fourier sine and Fourier cosine transforms and integrals.
b) Partial differential equation of first order of following form:-
(i) $f(p, q)=0$; (ii) $f(p, q, z)=0$; (iii) $f(x, p)=g(y, q)$; (iv) $Pp + Qq = R$ (Lagrange's Form); (v) $Z = px+qy+f(p, q)$ (Clairaut form)
- UNIT-V: Complex Analysis :- Functions of complex variables, Analytic function, Cauchy-Reimann conditions, Harmonic function, Harmonic conjugate functions, Milne's method conformal mappings (translation, rotation, magnification and bilinear

transformation), singular points, expansion of function in Taylor's and Laurent's series.

- UNIT-VI: Vector calculus:- Scalar and vector point functions, Differentiation of vectors, Curves in space, Gradient of a scalar point function, Directional derivatives, Divergence and curl of a vector point function and their physical meaning, expansion formulae (with out proof), line, surface, volume integrals, irrotational and solenoidal vector fields.

BOOKS RECOMMENDED:-

- 1) Elements of Applied Mathematics, Vol. II by P.N.Wartikar and J.N.Wartikar
- 2) Applied Mathematics, Vol. III, J.N. Wartikar and P.N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
- 3) Advancing Engg. Mathematics by E.K.Kreyzig.
- 4) A Text Book of Applied Mathematics by P.N.Wartikar and J.N.Wartikar.
- 5) Higher Engg. Mathematics by B.S.Grewal.
- 6) Control System by Gopal and Nagrath.
- 7) Integral Transforms by Goyal & Gupta.

3 IT 02 PROGRAMMING METHODOLOGY

(8 Hrs. / Unit)

- Unit I:** Introduction to Computer and Languages, OOPS and Software development: Software Engineering and SDLC. Java Basics: Program Components, Compilation cycle. Introduction to Applet and Application, Data types and Variables
- Unit II:** Operators: Arithmetic operators, relational operators, Assignment operators. Control statement: Selection statement: if, nested if, switch statement. Repetition statements: while, do-while, for, nested loops. Introduction to Math class. Arrays: Basics, One dimensional, Multidimensional, Array of Objects, Passing array to method.
- Unit III:** Introducing classes, class fundamentals, declaring objects, methods, class data, & instance data, constructor, this keyword, access control, Introduction to String and String Buffer classes.
- Unit IV:** Event handling: Event handling mechanism, Delegation Event model, Event, Event Listener: Action Listener, mouse Listener, mouse Motion Listener, window Listener, Introduction to AWT, AWT classes: Button, Text Field, Label. Working with Graphics, Working with colors. AWT controls Fundamentals: Adding and removing controls, responding to control. Using

- delegation Event model: Handling mouse events
- Unit V:** Applet class and its methods, Adapter classes, Inheritance, Polymorphism, Abstract classes and Interface, Packages. Multithreaded Programming: The java thread model, Creating a thread, Creating multiple threads.
- Unit VI:** Java File I/O: File, File Dialog object, Low and High level File I/O, the Stream classes, Byte Stream: Input stream, Output stream, File Input stream, File Output stream, Data Input stream, Data Output stream, Print Writer, Exception handling: Exception types, uncaught Exceptions using try and catch, throw, throws, finally. GUI objects programming: Frame class, menus and other GUI objects.

TEXT BOOK:

- 1) Herbert Schildt : Java Complete References(McGraw Hill)

REFERENCE BOOKS:

- 1) C.Thomas Wu: An Introduction to OOP with Java(McGraw Hill)
- 2) E. Balaguruswami : Programming with JAVA (4th edition), McGraw Hill
- 3) Sachin Malhotra : Programming in JAVA, Oxford Press.

3 IT 03**DISCRETE STRUCTURE**

(7 Hrs. / Unit)

- UNIT I:** Mathematical Logic : Statements & Notation , Connectives , Normal forms , The Theory of Inference for the statement calculus , Predicate calculus , The Theory of the Predicate Calculus.
- UNIT II:** Set Theory : Basic concepts of Set Theory , Representation of Discrete Structure, Relation and ordering, Functions , Recursion.
- UNIT III:** Algebraic Structures : Algebraic Systems , Semi groups and Monoids , Grammars and Languages, Polish expression & their compilation , Groups , Semi groups.
- UNIT IV :** Lattice & Boolean Algebra : Lattices as Partially ordered sets, Boolean Algebra, Boolean Functions, Representation of Boolean Functions , Minimization of Boolean Functions.
- UNIT V:** Graph Theory : Basic concepts of Graph Theory , Paths , reachability & connectedness, Matrix representation of graphs , Storage Representation and Manipulation of Graphs.Trees :Tree Traversal , Minimal spanning trees. PERT.
- UNIT VI:** Computability theory :Finite state machines , Finite state acceptors and regular grammars. Turning, machines and partial recursive functions.

TEXT BOOK :

1. J.P.Trembley, R.Manohar :”Discrete Mathematical Structures with Application to Computer Science” 1988 (Tata McGraw Hill)

REFERENCE BOOKS:-

1. S.K. Chakraborty & B.K.Sarkar ;”Discrete Mathematics” OXFORD.
2. Swapan Kumar Sarkar: “A Text Book of Discrete mathematics” (S.CHAND).
3. Bernard Kolman,Robert C.Busby, Sharon Ross: “Discrete Mathematical Structures” Third Edition PHI

3 IT 04**ELECTRONICS DEVICES AND CIRCUITS****UNIT I:**

Semiconductor Devices: PN Junction Diode, Zener diode BJT & FET transistor. Rectifying circuits & DC power supplies: HWR, FWR, BR, and Comparison. Inductor and capacitor Filter circuits for D.C. Power supplies.

UNIT II:

Transistor biasing: The CE amplifier (Simple analysis), Operating point, Stability Factor of self (Potential divider) bias Definition of Hybrid parameters. RC Oscillator: phase shift oscillator and Wein – Bridge oscillator, Transistor as a switch.

UNIT III:

Opto- Electronics Devices: fundamental of light, photoconductive sensors, photodiodes, phototransistors their principle of operation & application. Opto – couplers. Introduction to P-spice: Circuit element sources in PSPICE, Modeling analysis of diode, BJT & Op-Amp.

UNIT IV:

Operational Amplifier: Block diagram of op-amp, Differential amplifier, transfer characteristics, CMMR improvement, constant current source, dc level shifting, study of IC uA741. Inverting & non-inverting amplifier,

UNIT V:

Linear & non-linear application of Op-Amp: voltage follower, Integrator, Differentiator, voltage to current converter, sinusoidal RC Oscillator. Comparator, Astable Monostable, & Bistable Multivibrator. 3 pin IC Voltage regulator 78XX, 79XX.

UNIT VI:

Timer: block diagram of IC 555, application of Timer IC 555 as astable, monostable multivibrator, phase lock loops: operations of phase lock loop system, transfer characteristics, lock range capture range.

Text Books

1. N.N.Bhargava, D.C.Kulshreshtha, S.C.Gupta: Basic Electronics & Linear circuits, (TTTT)

2. M.H. Rasic: SPICE for circuits & electronics Using PSPICE (PHI)
3. Gayakwad R.A.: Op-Amps & Linear Integrated circuits (PHI)

Reference Books

1. Malvino: Principals of Electronics(TMh)
2. Millman & Halkins: Electronics Devices & Circuits (MC Graw Hill)
3. K.R.Botkar: Integrated circuits (Khanna P)
4. D.Roy Choudhury & Shail Jain: Linear Integrated circuits (NAIL)

3 IT 05 ASSEMBLY LANGUAGE PROGRAMMING

- Unit I: Microprocessor 8086 architecture-BIU and EU, pin configuration, Software model of 8086 microprocessor. Memory addresses space and data organization. Data types. Segment registers, memory segmentation. IP & Data registers, Pointer, Index registers. Memory addresses generation, Maximum and Minimum Modes.
- Unit II: 8086 Instruction set overview, addressing modes. 8086 instruction formats. 8086 programming: Integer instructions and computations: Data transfer instructions, Arithmetic instructions, and logical instructions. Shift and rotate instructions and their use in 8086 programming
- Unit III: 8086 programming: 8086 flag register and Flag control instructions control flow and jump instructions, Loops & loop handling instructions. Stack related instructions. 8086 I/O Address space. Subroutines and related instructions, Concept of Macros and their types. 8086 programming using these instructions
- Unit IV: Memory system design: Address decoding techniques, static-RAM interfacing, Dynamic-RAM (DRAM): refreshing techniques, interfacing and DRAM controllers; direct memory access (DMA). Interfacing Chips- SRAM and EPROM with 8086, 8237 DMA: pin diagram, internal organization, modes of operation
- Unit V: 8086 I/O: Types of input output, isolated I/O interface, input output data transfers, I/O instructions and bus cycles. Programmable Peripheral Interface 8255 PPI: pin diagram, internal organization, modes of operation. Programmable Interval Timer / Counter 8253: pin diagram, internal organization, modes of operation
- Unit VI: 8086 Interrupts types, priority and instructions. Interrupt vector table, External hardware-interrupt interface signals & interrupts sequence. Software interrupts, Non-maskable interrupts. Programmable Interrupt Controller 8259: pin diagram, internal organization, modes of operation...

TEXT BOOKS:

1. Avtar Singh & Walter A. Triebel: The 8088 and 8086 Microprocessors, Programming, Interfacing, Software, Hardware, and Applications, PHI, 2003.
2. K.M Bhurchandi, "Advanced Microprocessor and Peripherals Architecture, Programming and Interfacing", Tata Mc Graw Hill , 2006.
3. Ray & Bhurchandi: Advanced Microprocessors & Peripherals (TMH).
4. Liu Gibson: Microcomputer Systems: The 8086/8088 Family- Architecture, Programming And Design , PHI)

REFERENCES:

1. Barry B. Brey : The Intel Microprocessor Architecture, Programming & Interfacing (6/e)(PHI)
2. John P Uffenbeck, "8086/8088 Families: Designing, Programming and Interfacing". Prentice Hall
3. D. V. Hall: Microprocessors and Interfacing, TMH.

3IT06 Programming Methodology Lab.: Minimum Eight experiments/programming assignments must be completed based on the 3 IT 02 syllabus covering each of the units.

3IT07 Electronics Devices & Circuits Lab. : Minimum Eight experiments/programming assignments must be completed based on the 3 IT 03 syllabus covering each of the units. At least two experiments must be conducted using PSPICE.

3IT08 Assembly Language Programming Lab. : Minimum Eight experiments/programming assignments must be completed based on the 3 IT 04 syllabus covering each of the units.

3IT09 Computer Lab-I (Linux,Unix) Lab. : Minimum Eight experiments/programming assignments must be completed based on Linux and /or Unix.

**SEMESTER : FOURTH
DATASTRUCTURES**

4IT01

- Unit I: Data structures basics, Mathematical /algorithmic notations & functions, Complexity of algorithms, Subalgorithms. String processing: storing strings, character data type, string operations, word processing, and pattern matching algorithms.
- Unit-II: Linear arrays and their representation in memory, traversing linear arrays, inserting & deleting operations, Bubble sort, Linear search and Binary search algorithms. Multidimensional arrays, Pointer arrays. Record structures and their memory representation. Matrices and sparse matrices.
- Unit-III: Linked lists and their representation in memory, traversing a linked list, searching a linked list. Memory allocation & garbage collection. Insertion deletion operations on linked lists. Header linked lists, Two-way linked lists.
- Unit-IV: Stacks and their array representation. Arithmetic expressions: Polish notation. Quick sort, an application of stacks, Recursion. Tower of Hanoi problem. Implementation of recursive procedures by stacks, Queues. Deques. Priority queues.
- Unit-V: Trees, Binary trees & and their representation in memory, Traversing binary trees. Traversal algorithms using stacks, Header nodes : threads. Binary search trees, searching, inserting and deleting in binary trees. Heap and heapsort. Path length & Huffman's algorithm. General trees, M-way search Trees.
- Unit-VI: Graph theory, sequential representations of graphs, Warshalls' algorithm, Linked representation, operations & traversing the graphs. Posets & Topological sorting. Insertion Sort, Selection Sort. Merging & Merge-sort, Radix sort, Hashing.

Textbook :

Seymour Lipschutz : " Theory & Problems of Data Structures"
Schaum's Outline series (Mc Graw-Hill) International Editions.

REFERENCES:

1. Reema Thareja : Data Structures Using C. (Oxford)
2. Ellis Horowitz, Sartaj Sahni – Fundamentals of Data Structures (CBS Publications)
3. Trembley, Sorenson:- An Introduction to Data Structures with Applications.
4. Aho Ullman : Analysis and Design of Algorithms.

5. Bhagat Singh, Naps : Introduction to Data Structures.

4IT02**COMMUNICATIONENGINEERING**

Unit I

AM Transmitters

Modulation, need of modulation, AM Modulation, Frequency spectrum, Principles of DSB-FC, DSBSC, SSB-SC modulation and their comparison, Details of DSBFC Transmitter, Generation of DSB-SC by using balanced modulators (FET & Diodes), DSB-SC Transmitter, Generation of SSB-SC by phase-shift method.

Unit II

AM Receivers

TRF receiver, Superhetrodyne receiver, Details of each block such as RF amplifier, mixer oscillator, IF amplifier, Diode detector, Audio Amplifier. Need and type of AGC, Communication Receiver, Selectivity filter method, Phase shift method, sensitivity, Image rejection ration of communication receiver, Noise calculation in DSB-FC, DSB-SC & SSB-SC

Unit III

FM Transmitters

FM Modulation, Frequency Spectrum, Circuits & Analysis for direct FM generation using FET and varactor diode. Circuit & analysis of Indirect FM generation, Narrow Band and Wide Band FM, their comparison, Pre-emphasis and De-emphasis.

Unit IV

FM Receivers

Details of FM receiver, blocks such as R.F. amplifier, local oscillator, IF amplifier, Mixer, AudiQ Amp!., AGC, Limiter, FM Discriminator, Single Slope and Balanced slope detector, Analysis of Foster seeley and ratio detectors, Stereo FM receiver, Noise in FM Reception, FM threshold effect.

Unit V

Pulse Modulation Technique : The sampling theorem, Sampling of Band-Pass Signal, Linear and Non linear quantization, Aliasiry effect, Aperture effect, Reconstruction of filter, Time Division Multiplexing, Pulse Amplitude Modulation, Pulse Time Modulation, PCM, DM, ADM

Unit VI

Signal Analysis

Fourier Series, Exponential Fourier Series, Fourier Transform, Properties of Fourier Transform, Delta Function, Fourier Transform of Periodic functions, fundamental of Power Spectral Density & Energy Spectral Density, Correlation, auto-correlation, Cross-correlation.

Text Books

- (1) Kennedy G. : "Electronic Communication System" Tata Mc-Graw Hill Co., New Delhi (Third Edition)
- (2) Taub and Schilling D.L. : Principles of Communication Systems, Mc-

Reference books:-

- (1) B. P. Latbi : “Modern Digital and Analog Communication Systems” Oxford University Press, New Delhi.
- (2) Hari Bhat: “Analog Communication, 2nd Edition Pearson India, 2010”
- (3) S. Kundu: “ Analog & Digital Communication, Pearson India, 2010”
- (4) R.P.Singh, S.D. Sapre: Communication System, Analog and Digital, Tata Mc-Graw Hill Co., New Delhi.

4IT03 OBJECTORIENTED TECHNOLOGIES

- UNIT I:** Introduction to Object Oriented Programming: Introduction to procedural, modular, object-oriented and generic programming techniques, Limitations of procedural programming, Need of object-oriented programming, fundamentals of object-oriented programming. Objects & classes in C++: Declaring & using classes, Constructors, Objects as functions arguments, Copy Constructor, Static class data. Arrays of objects,
- UNIT II:** C++ string Class. Operator overloading :Overloading unary & binary operators. Data conversion. Pitfalls of operator overloading. Pointers& Arrays. Pointer & functions. New & deleter operators. Pointers For objects.
- UNIT III:** Inheritance in C++ :Derived class & base class, Derived class Constructors, Function overloading, class hierarchies, public and private inheritance, multiple inheritance Containership : classes within classes.
- UNIT IV:** Virtual functions concepts, Abstracts classes & pure virtual Functions. Virtual base classes, Friend functions, static Functions, Assignment and copy initialization the this pointer. Dynamic type information. Introduction to C++ graphics, creating basic shapes, using colors and styles .
- UNIT V:** Streams & File in C++: Stream classes, stream errors, disk File I/O with streams File pointers, Error handling in file I/O File I/O with members functions, overloading the extractions & Insertion operators, Memory as a stream object, command Line arguments. Multifile programs.
- UNIT VI:** Function Tamplate, class templates, Exception syntax Multiple exceptions, exception with arguments. Introduction to the Standard Template Library. Algorithms, Sequential Containers iterators, specialized iteratrors, associative containers Function objects.

Text Book:

1. Robert Lafore Object-Oriented Programming in C++ (Galgotia Publications)

References:

1. E. Balaguruswamy, “Object Oriented Programming with C++”, Tata McGraw-Hill Publishing Company Ltd, New Delhi ISBN 0 - 07 - 462038 - X.
2. Herbert Schildt C++ : Complete Reference (TMH)
3. BPB Editorial Board Advanced C++(BPB Publications)
4. Lipmann C++ Primer (Addison-Welsley)

4IT 04/ 4 BM 04 SOCIAL SCIENCES & ENGINEERING ECONOMICS**SECTION - A**

- Unit I : Study of Social Science : Importance to Engineer, salient features of Indian constitution. Fundamental Rights and Duties. Directive Principles of State Policy. (9)
- Unit II : Indian Parliament : composition and powers. President of India : Election and Powers. Council of Ministers and Prime Minister (9)
- Unit III : Impact of Science and Technology on culture and Civilization. Human Society : Community Groups, Social Control : Meaning, Types and Agencies. Marriage and Family : Functions, Types and problems.

SECTION - B

- Unit IV: Nature and scope of Economics : Special significance of Economics to Engineers. Production : Factors of production, Laws of return, Various Economic systems, Forms of Business Organisation. (9)
- Unit V : Banking : Functions of Central and Commercial Banks. Taxation : Principle of taxation, Direct and Indirect taxes. Market : Forms, perfect and imperfect competition, pricing under perfect and imperfect competition, prices discrimination under monopoly. (9)
- Unit VI: Economics of Development : Meaning, Characterisits of under development, obstacles to Economic growth and vicious circle of poverty. Economic Planning : meaning, objective and salient features of current five years plan of India. Planning horizons, life structuring the alternatives. Economics of comparision of different alternative projects.

Books Recommended :

1. Pylee M.V. : Constitutional Govt. in India, S.Chand and Co.
2. Joshi G.N. : The Constitution of India, Macmillan India Ltd.
3. Mahajan : The Constitution of India, S.Chand, New Delhi.
4. Maclaver and Page : Principle of Sociology.
5. Davis K. : Human Society
6. Dewett and Varma J.D. : Elementary Economic Theory, S.Chand and Co.
7. A.N.Agrawal : Indian Economy, Problem of Development and Planning (Wiley Eastern Ltd), New Delhi.
8. S.K.Mishra : Indian Economy, Its Development Experience. Himalaya Pub.House, Bombay.
9. Datt R.K. : Indian Economy, S.Chand and Comp. New Delhi P.M.Sundharam
10. Dhingra I.C. : Indian Economy
11. E.Kuper : Economics of W.R.Development, McGraw Hill Co.,
12. James L.E., R.R.Lee : Economics of W.R.Planning, McGraw Hill Co.

4IT05 NUMERICAL METHODS & OPERATION RESEARCH TECHNIQUES

- Unit I: Error Analysis, absolute, relative and percentage errors. A general error formula and error in series approximation, Solution of Non linear and polynomial equations: Bisection Method, False Position method, secant, Newton Raphson methods.
- Unit II: Solution of Linear Systems of Equation : Gauss elimination method, Gauss Jordan Method, Gauss Seidel Iterative Method, Gaussian elimination, Matrix Inversion Method, L-U factorization method. Regression, Curve fitting: Least Square Method, Correlations.
- Unit III: Integration and Differential equations : Numerical Integration-Trapezoidal, Simpsons one third and three eight rules, Romberse Method. Newtons forward and backward interpolation formula. Numerical differentiation : Maximum and minimum values. Lagrange's Interpolation Method, Euler's method, Runge Kutta methods, Predictor Corrector method, Taylor Series.
- Unit IV: Operations Research Models and Dynamic Programming : Operations research models- classification of problems, phases of operation research, scope and limitation of operations research. Dynamic programming : Investment

problem Stagecoach Problem, Equipment Replacement problem, conversion of final value problem into an initial value problems.

Unit V : Linear Programming and Sequencing: Linear programming – Concept of Linear Programming, simplex method, Big-M Method, Two Phase Simplex Method, concept of duality, transportation problems, Assignment Problem, Hungarian Method. Sequencing Problem: Two-Machine, N-Jobs, and Three Machine Problem.

Unit VI: PERT and CPM : Pert Networks, ET, TE, TL, SE and Critical path, Probability of completion. Decision theory : Introduction, Minimax decision procedure, Bayes decision procedure with and without data, Regret function Vs. Loss function.

TEXT BOOKS :-

- 1) Computer Oriented Numerical Methods : V.Rajaraman, Second Edition, Prentice Hall of India Pvt. Ltd., New Delhi.
- 2) Introduction to Operation Research : Billy, E.Gillett, Tata McGraw Hill Pub. Co. Ltd., New Delhi.

REFERENCE BOOKS

- 1) Introduction to Methods of Numerical Analysis : S.S.Shastry, Second Edition, Prentice Hall of India Pvt. Ltd., New Delhi.
- 2) Optimization Theory and Applications : S.S.Rao, Second Edition, Wiley Eastern Limited, New Delhi.
- 3) J. N. Kapoor- Mathematical Statistics Tata McGraw Hill Pub. Co. Ltd.

4IT06 Data Structures Lab : Minimum Eight experiments/programming assignments must be completed based on the respective syllabus covering each of the units.

4IT07 Communication Engineering Lab : Minimum Eight experiments/programming assignments must be completed based on the respective syllabus covering each of the units.

4IT08 Object Oriented Technologies Lab : Minimum Eight experiments/programming assignments must be completed based on the respective syllabus covering each of the units.

4IT09 Computer Lab-II (HTML) : Minimum Eight experiments/programming assignments must be completed based on HTML.

This Lab is based on Web publishing. The topics to be covered include

1. Web Publishing
2. Web Page Design
3. Exposure to IE & NN Browsers

4. Dynamic HTML.

Each group of 2 students should build their own Website.

Text Book: M. Petrovsky : Dynamic HTML in Action (TMH)

***Content of the Compulsory Subject
“Environmental Studies” are given on Page
Nos. ES-1 to ES-4 i.e. at the end of this syllabus.***

ES-1
ENVIRONMENTAL STUDIES

Total Marks : 100

PART-A

SHORT ANSWER PATTERN 25 Marks

1. The Multidisciplinary nature of environmental studies

- . Definition, scope and importance.
- . Need for public awareness.

(2 lecture hours)

2. Social Issues and the Environment

- . From Unsustainable to Sustainable development
- . Urban problems related to energy
- . Water conservation, rain water harvesting, watershed management
- . Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- . Environmental ethics : Issues and possible solutions.
- . Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- . Wasteland reclamation.
- . Consumerism and waste products.
- . Environment Protection Act.
- . Air (Prevention and Control of Pollution) Act.
- . Water (Prevention and Control of Pollution) Act.
- . Wildlife Protection Act.
- . Forest Conservation Act.
- . Issues involved in enforcement of environmental legislation.
- . Public awareness.

(7 lecture hours)

3. Human Population and the Environment

- . Population growth, variation among nations.
- . Population explosion - Family Welfare Programme.
- . Environment and human health.
- . Human Rights.
- . Value Education.
- . HIV / AIDS.
- . Women and Child Welfare.
- . Role of Information Technology in Environment and human health.
- . Case Studies.

(6 lecture hours)

ES-2

PART-B

ESSAY TYPE WITH INBUILT CHOICE

50 Marks

4. Natural resources :

. Renewable and non-renewable resources :

- . Natural resources and associated problems.
 - Forest resources : Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
 - Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
 - Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
 - Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer - pesticide problems, water logging, salinity, case studies.
 - Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.
 - Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- . Role of an individual in conservation of natural resources.
- . Equitable use of resources for sustainable lifestyles.

(8 lecture hours)

5. Ecosystems

- . Concept of an ecosystem.
- . Structure and function of an ecosystem.
- . Producers, consumers and decomposers.
- . Energy flow in the ecosystem.
- . Ecological succession.
- . Food chains, food webs and ecological pyramids.
- . Introduction, types, characteristic features, structure and function of the following ecosystem :-
 - Forest ecosystem
 - Grassland ecosystem
 - Desert ecosystem
 - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lecture hours)

6. Biodiversity and its conservation

- . Introduction - Definition : genetic, species and ecosystem diversity.
- . Biogeographical classification of India.
- . Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
- . Biodiversity at global, National and local levels.
- . India as a mega-diversity nation.
- . Hot-spots of biodiversity.

ES-3

- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.
 - Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity. (8 lecture hours)

7. Environmental Pollution

- Definition
- Causes, effects and control measures of :-
 - Air pollution
 - Water pollution
 - Soil pollution
 - Marine pollution
 - Noise pollution
 - Thermal pollution
 - Nuclear hazards
- Solid Waste Management : Causes, effects and control measures of
 - Role of an individual in prevention of pollution.
 - Pollution case studies.
 - Diaster management : floods, earthquake, cyclone and landslides. (8 lecture hours)

PART-C ESSAY ON FIELD WORK 25 Marks

8. Field work

- Visit to a local area to document environmental assets - river / forest / grass land / hill / mountain
- Visit to a local polluted site - Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems - pond, river, hill slopes, etc. (5 lecture hours)

- (Notes : i) Contents of the syllabys mentioned under paras 1 to 8 shall be for teaching for the examination based on Annual Pattern.
ii) Contents of the syllabys mentioned under paras 1 to 4 shall be for teaching to the Semester commencing first, and
iii) Contents of the syllabys mentioned under paras 5 to 8 shall be for teaching to the Semester commencing later.

LIST OF REFERENCES :-

- Agarwal, K.C., 2001, Environmental Biology, Nidi Publ. Ltd., Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email : mapin@icenet.net (R)
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)

ES-4

- Cunningham, W.P.Cooper, T.H.Gorhani, E & Hepworth, M.T., 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993, Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press. 473p.
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural Histroy Society, Mumbai (R)
- Heywood, V.H. & Watson, R.T. 1995, Global Biodiversity Assessment, Cambridge Univ. Press 1140p
- Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi. 284 p.
- Mckinney, M.L. & Schoch, R.M. 1996, Environmental Science Systems & Solutions, Web Enhanced Edition. 639 p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publications (TB)
- Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P., 1971, Fundamentals of Ecology, W.B.Saunders Co., U.S.A., 574p.
- Rao M.N. & Datta A.K., 1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd. 345 p.
- Sharma B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
- Survey of the Environment, The Hindu (M)
- Townsend C., Harper J., and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
- Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R)
- Trivedi R.K. and P.K. Goel, Introduction to Air Pollution, Techno-Science Publications (TB)
- Wagner K.D., 1998, Environmental Management, W.B.Saunders Co., Philadelphia, USA 499p.
- डॉ. विठ्ठल धारपूरे : पर्यावरणशास्त्र- पिंपळापूरे अॅन्ड कंपनी पब्लीशर्स, नागपूर.(R)
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(M) Magazine

(R) Reference

(TB) Textbook

DIRECTION

No. 31/2011

Date : 10/06/2011

Subject : Schemes of teaching & examinations of III to VIII/X Semesters as per Credit Grade System of various branches in the faculty of Engineering & Technology

Whereas faculty of Engineering & Technology in its meeting held on 6th June, 2011 vide Item No. 39 accepted and recommended schemes of teaching & examinations of III to VIII/X as per Credit Grade System of various branches as per Credit Grade System in the faculty of Engineering & Technology for its implementation from the session 2011-2012 in phase wise manner,

AND

Whereas the schemes of teaching & examinations of VII & VIII/X Semesters as per Credit Grade System of various branches in the faculty of Engineering & Technology were accepted by the Hon'ble Vice-Chancellor u/s Section 14 (7) of M.U. Act, 1994 on behalf on Academic Council on 9th June, 2011,

AND

Whereas this schemes of teaching & examinations of various branches as per Credit Grade System in the faculty of Engineering & Technology are required to be regulated by the Regulation,

AND

Whereas the process of making the Regulation is likely to take some time,

AND

Whereas the schemes of various branches as per Credit Grade System in the faculty of Engineering & Technology are to be implemented from the academic session 2011-2012,

AND

Whereas syllabi of various branches in the faculty of Engineering & Technology are to be sent for printing.

Now, therefore, I, Dr. Mohan K. Khedkar, Vice-Chancellor of Sant Gadge Baba Amravati University in exercise of powers confirmed upon me under sub section (8) of Section 14 of the Maharashtra Universities Act, 1994, hereby direct as under :-

- 1) This Direction shall be called "Schemes of teaching & examinations of III to VIII/X Semesters as per Credit Grade System of various branches in the faculty of Engineering & Technology, Direction, 2011"
- 2) This Direction shall come into force from the date of its issuance.
- 3) Schemes of teaching and examinations of III to VIII/X semesters as per Credit Grade System of the following branches shall be as per respective Appendices appended with this Direction :-

BRANCH

- 1) Civil Engineering
- 2) Mechanical Engineering
- 3) Production Engineering
- 4) Electrical Engineering (Electronics & Power)
- 5) Electrical and Electronics Engineering
- 6) Electrical Engineering (Electrical & Power)
- 7) Electrical Engineering
- 8) Electronics & Telecommunication Engineering
- 9) Electronics Engineering
- 10) Instrumentation Engineering
- 11) Computer Science & Engineering
- 12) Computer Engineering
- 13) Architecture
- 14) Textile Engineering
- 15) Chemical Engineering
- 16) Chemical Technology (Polymer) (Plastic) Technology
- 17) Chemical Technology (Food, Pulp & Paper, Oil & Paint and Petrochemical) Technology
- 18) Information Technology
- 19) Biomedical Engineering

Appendix No.

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Sd/-

Dr. Mohan K. Khedkar
Vice-Chancellor
