Electronic Devices

Unit-I

Evaluation Of Electronics: Introduction & Application Of Electronics, Energy Band Theory Of Crystals,
Energy Band Structures In Metals, Semiconductors And Insulators, Theory Of Semiconductors: Classification Of Semiconductors, Conductivity Of Semiconductors, Carrier Concentration In Intrinsic & Extrinsic Semiconductors, Properties Of Intrinsic And Extrinsic Semiconductors, Variation In Semiconductors Parameters With Temperature, Fermi-Dirac Function, Fermi Level In A Semiconductor Having Impurities, Band Structure Of Open-Circuited P-N Junction, Drift And Diffusion Currents, Carrier Life Time, Continuity Equation (Elementary Treatment Only)

Unit – II

Theory of p-n junction Diode: Diode Current Equation, Diode Resistance, Transition Capacitance, Diffusion
Capacitance, (Elementary treatment only), Effect of Temperature on p-n Junction Diode, Switching
Characteristics, Piecewise Linear Model, Special Diodes: Zener Diode, Varactor Diode, Tunnel Diode,
Photodiode, Light Emitting Diodes, Schottky Barrier Diode, Applications of Diodes: Half-Wave Diode
Rectifier, Full-Wave Rectifier, Clippers and Clampers (Elementary treatment only).

Unit – III

Bipolar junction transistor: Introduction of transistor, construction, transistor operations, BJT characteristics, load line, operating point, leakage currents, saturation and cut off mode of operations, Eber-moll's model.

Unit – IV
Application of BJT: CB, CE, CC configurations, hybrid model for transistor at low frequencies, Introduction to FETs and MOSFETs. Fundamentals of digital electronics: Digital and analog signals, number systems, Boolean algebra, logic gates with simple applications, logic gates, karnaugh maps.

Text Books
[T1] S. Salivahanan, N. Suresh Kr. & A. Vallavaraj, ―Electronic Devices & Circuit‖, Tata McGraw Hill,
2008
[T2] Millman, Halkias and Jit, ―Electronic devices and circuits‖ McGraw Hill
[T3] Boylestad & Nashelsky, ―Electronic Devices & Circuits‖, Pearson Education, 10TH Edition.
Reference Books
[R1] Sedra & Smith, ―Micro Electronic Circuits‖ Oxford University Press, VI Edition
[R2] Robert T. Paynter, ―Introducing Electronic Devices & Circuits‖, Pearson Education, VII Edition, 2006

Introduction to Programming

UNIT I
Concept of algorithms, Flow Charts, Overview of the compiler (preferably GCC) , Assembler, linker and
loader , Structure of a simple Hello World Program in C ,Overview of compilation and execution process in an IDE (preferably Code Block)

UNIT II
Programming using C: Preprocessor Directive, C primitive input output using get char and put char , simple I/O Function calls from library , data type in C including enumeration , arithmetic, relational and logical operations, conditional executing using if, else, switch and break .Concept of loops , for, while and do-while , Storage Classes: Auto, Register, Static and Extern

UNIT III
Arrays (one and two dimensional), 2-d arrays used in matrix computation. Concept of Sub-programming,
functions. Parameter transmission schemes i.e. call by value and call by reference, Pointers, relationship
between array and pointer, Argument passing using pointers, Array of

pointer, passing arrays as arguments

UNIT IV
Structure and unions , Strings and C string library, File Handling in C Using File Pointers,fopen( ), fclose(
),Input and Output using file pointers, Character Input and Output with Files , String Input / Output Functions , Formatted Input / Output Functions,Block Input / Output Functions, Sequential Vs Random Access Files , Positioning the File Pointer

Text Books:
[T1] Herbert Schildt, ―C: The Complete Reference‖, OsbourneMcgraw Hill, 4th Edition, 2002.
[T2] Forouzan Behrouz A. ―Computer Science: A Structured Programming Approach Using C, Cengage
Learning 2/e

Reference Books:
[R1] Kernighan & Ritchie, ―C Programming Language‖, The (Ansi C version), PHI, 2/e
[R2] K.R Venugopal, ―Mastering C ‖, TMH
[R3] R.S. Salaria "Application Programming in C " Khanna Publishers4/e
[R4] Yashwant Kanetkar ― Test your C Skills ‖ , BPB Publications
[R5] http://www.codeblocks.org/
[R6] http://gcc.gnu.org/
[R7] Programming in ANSI C, E. Balagurusamy; Mc Graw Hill, 6th Edition.

ENVIRONMENTAL STUDIES

UNIT I: Environmental Studies: Ecosystems, Bio-diversity and its Conservation (i) The Multidisciplinary Nature of Environmental StudiesDefinition, scope and importance of Environmental Studies. Biotic and a biotic component of environment, need for environmental awareness. (ii) 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, structures and function of the following ecosystem: (a) Forest ecosystem (b) Grassland ecosystem (c) Desert

ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries). (iii) Bio-diversity and its Conservation Introduction to biodiversity —definition: genetic, species and ecosystem diversity, Bio-geographical 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, Threats to biodiversity : Habitat loss, Poaching of wildlife, man-wildlife conflicts, rare endangered and threatened species(RET) endemic species of India, method of biodiversity conservation: In-situ and ex-situ conservation. [T1], [R3][No. of hrs. 08]

UNITII: Natural Resources: problems and prospects (i) Renewable and Non-renewable Natural Resources Concept and definition of Natural Resources and need for their management 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, Water conservation, rain water harvesting, watershed management. Mineral resources: Uses are exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes causes by agriculture and over-grazing, 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, Urban problems related to energy, case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. [T1], [R3][No. of hrs. 08]

UNIT III: Environmental Chemistry and Pollution Control (i) Chemistry of Environment (a) Green Technology Principles of Green technology, Zero Waste Technology, Green Chemistry & Its basic principles, Atom Economy, Green Methodologies. clean development mechanisms (CDM), concept of environmental impact assessment, (b) Eco-Friendly polymers Environmental degradation of polymers, Biodegradable, Photo-biodegradable polymers, Hydrolysis & Hydrobiodegradable, Biopolymers & Bioplastics: polylactic acid, polyhydroxybutyrate, polycaprolactone,. Concept of bioremediation. (ii)Environmental Pollution Definition, types, causes, effects and control measures of (a) Air pollution, (b) Water pollution, (c) Soil pollution, (d) Marine pollution, (e) Noise pollution, (f) Thermal pollution, (g) Nuclear hazards. Pollution case studies. Solid waste and

its management: causes, effects and control measures of urban and industrial waste. Chemical toxicology-Terms related to toxicity, impact of chemicals (Hg, As, Cd, Cr, Pb) on environment. [T1], [R3] [No. of hrs. 08]

UNIT IV: Disaster Management, Social Issues, Human Population and the Environment (i) Disaster Management Disaster management: floods, earthquake, cyclone and land-slides, nuclear accidents and holocaust, case studies. (ii) Social Issues, Human Population and the Environment Sustainable development, Climate change, global warming, acid rain, ozone layer depletion, Environmental ethics: Issues and possible solutions, Consumerism and waste products, , Wasteland reclamation. Population growth, problems of urbanisation. Environment Protection Act, 1986; Air (Prevention and Control of Pollution) Act, 1981; Water (Prevention and Control of Pollution) Act, 1974; Wildlife Protection Act, 1972; Forest Conservation Act, 1980; Environmental management system standards-ISO 14000 series. [T1] [No. of hrs. 08]

Text Books:

[T1] E. Barucha, Textbook of Environmental Studies for Undergraduate Courses, Universities Press (India) Pvt. Ltd., 2005.

[T2] S. Chawla, A Textbook of Environmental Studies, McGraw Hill Education Private Limited, 2012

References Books:

[R1] G. T. Miller, Environmental Science, Thomas Learning, 2012

[R2] W. Cunningham and M. A. Cunningham, Principles of Environment Science: Enquiry and Applications, Tata McGraw Hill Publication, N. Delhi, 2003.

[R3] R. Rajagopalan, Environmental Studies: From Crisis to Cure, 2nd Edition, Oxford University Press, 2011.

[R4] A.K. De, Environmental Chemistry, New Age Int. Publ. 2012,,

[R5] A. Kaushik and C.P. Kaushik, Perspectives in Environment Studies, 4th Edition, New Age International Publishers,2013

[R6] Environmental Engineering by Gerard Kiely, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2010.

Applied Mathematics-II

Unit -I
Partial differentiation and its Applications: Partial derivatives of first and second order. Euler's theorem for
homogeneous functions (without proof). Derivatives of Implicit Functions, total derivatives. Change of variables.
Jacobian. Taylor's theorem for function of two variables(without proof). Error and approximation. Extreme values
of function of several variables(maxima ,minima, saddle points). Lagrange method of undetermined multipliers.
Partial differential equations: Formulation, solution of first order equations, Lagranges equations, Charpit's
method.

Unit-II
Laplace Transformation: Definition, Laplace transformation of basic functions , existence condition for Laplace
transformation, Properties of Laplace transformation(Linearity, scaling and shifting). Unit step function, Impulse
Function, Periodic Functions. Laplace transformation of derivatives, Laplace transformation of integrals,
differentiation of transforms, Integration of transforms, Convolution theorem ,inverse Laplace transformation.
Solution of ordinary Differential equations.

Unit-III
Complex Function: Definition, Derivatives, Analytic function, Cauchy's Riemann equation (without proof).
Conformal and bilinear mappings, Complex Integration: Complex Line integration, Cauchy's integral theorem
and integral formula(without proof). Zeros and Singularities, Taylor's and Laurent's series (without proof).
Residues, Residue theorem (without proof). Evaluation of real definite integrals: Integration around the unit circle,
Integration around a small semi circle and integration around rectangular contours.

Unit-IV

Multiple integrals: Double integrals, Change of order of integration, Triple integrals. Vector Calculus: Scalar and
vector functions, Gradient, Divergence and curl. Directional derivatives, Line Integrals. Surface integrals, volume integrals. Green's theorem, Stoke's theorem and Gauss divergence theorem (without proof).

Text:
[T1]. E. kresyzig,‖ Advance Engineering Mathematics‖, Wiley publications
[T2] Michael Greenberg, —Advance Engineering mathematics‖, Pearson.

References:
[R1] R.K. Jain and S.R.K. Iyengar,‖Advanced Engineering Mathematics —Narosa Publications
[R2] B. S. Grewal,‖Higher Engineering Mathematics‖ Khanna Publications.
[R3] S. Ponnusamy, —Foundation of Complex Analysis‖ Narosa Publication
[R4] G.B. Thomas and R. N. Finny — Calculus and Analytic Geometry‖ Addison Wesley/ Narosa
[R5] Wylie R, — Advance Engineering mathematics‖ , McGraw-Hill
[R6] M. Spiegel, —Schaum's Outline on Laplace Transform, Tata McGraw-Hill