

IIIrd & IV Semester B.E.
(Electronics & Telecommunication /
Industrial Electronics)

Prospectus No. 091719

SANT GADGE BABA AMRAVATI UNIVERSITY

(FACULTY OF ENGINEERING & TECHNOLOGY)

PROSPECTUS

PRESCRIBED FOR
FOUR YEAR DEGREE COURSE
BACHELOR OF ENGINEERING
ELECTRONICS & TELECOMMUNICATION /
INDUSTRIAL ELECTRONICS ENGINEERING
THIRD & FOURTH SEMESTER
EXAMINATIONS, 2008-2009
SEMESTER PATTERN



2008

Price Rs.10/-

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SYLLABUS

PRESCRIBED FOR

THIRD & FOURTH SEMESTERS B.E. EXAMINATIONS

ELECTRONICS AND TELECOMMUNICATION /

INDUSTRIAL ELECTRONICS

THIRD SEMESTER

3SULI 1

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 (10 Hrs.)
- 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. (10 Hrs.)
- UNIT-III a) Difference equation:- solution of difference equations of first order, Solution of difference equations of higher order with constant co-efficients,
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. (10 Hrs.)

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
Statistics:

2

Binomial, Poisson and Normal Distribution. (10 Hrs.)

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, inversion and bilinear transformation), singular points, expansion of function in Taylor's and Laurent's series. Cauchy's integral theorem and formula, Residue theorem. (10 Hrs.)

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, Stoke's and Divergence theorem (without proof). (10 Hrs.)

BOOKS RECOMMENDED:-

- 1) Elements of Applied Mathematics by P.N. Wartikar and J.N. Wartikar
- 2) A text book of Differential Calculus by Gorakh Prasad.
- 3) Engg. Mathematics by Chandrika Prasad.
- 4) Advancing Engg. Mathematics by E.K. Kreyzig.
- 5) A text book of Applied Mathematics by P.N. Wartikar and J.N. Wartikar.
- 6) Higher Engg. Mathematics by B.S. Grewal.
- 7) Control System by Gopal and Nagrath.
- 8) Integral Transforms by Goyal & Gupta.

3SULI 2 ELECTRONIC DEVICES AND CIRCUITS-I

SECTION-A

- UNIT-I P-N Junction diode theory, Rectifiers - Half wave, full wave and bridge. Filters-C, LC and their analysis, Zener diode and its applications.
- UNIT-II Theory and Analysis of BI Junction transistor, 'H' Parameter, Methods of biasing, their needs, 'Q' and stability factor.
- UNIT-III Study of typical transistor amplifier circuits:
i) Emitter follower,
ii) Darlington emitter follower.

- iii) Bootstrap emitter follower,
- iv) RC coupled amplifier,
- v) Transformer coupled amplifier,
- vi) Cascaded amplifier,
- vii) Direct coupled amplifier,
- viii) Cascade stage.

SECTION-B

- UNIT-IV Class 'A', 'B', 'AB' and 'C' amplifiers, Configuration of audio amplifiers, Calculations of power gain, efficiency, power dissipation and distortion, Oscillators, their criteria, Hartley, Colpitt and R-C oscillators, Crystal oscillator,
- UNIT-V Theory, construction and applications of Schottky diode, Tunnel diode, Varactor diode, Selenium diode, LED, Photo diode, PIN diode, photo-transistor.
- UNIT-VI **FETs (JFET & MOSFET):**
Types, Characteristics and parameters (μ , g_m & R_{ds}), Biasing of FET Amplifiers, UJT: Characteristics, working, UJT as relaxation oscillator.

BOOKS RECOMMENDED:

- 1) Milliman H. and Halkies: "Integrated Electronics", Tata Mc-Graw Hill Book Co., New Delhi.
- 2) Mottershead Allen: "Electronics Devices & Circuits" Prentice Hall of India Private Limited, New Delhi, 1986.
- 3) Boylestad R. and "Electronics Devices & Circuits", Prentice Hall of India Private Limited, New Delhi (Fifth Edition), 1993.
- 4) Ramanan K.V.: "Functional Electronics", Tata Mc-Hill Publication Co. Ltd., New Delhi, 1989.
- 5) Milliman S., Tube H. and Halkies: "Electronics Devices & Circuits", Mc-Graw Hill Int. Co., Auckland, 1982.

PRACTICALS-I

3SULI2- ELECTRONIC DEVICES AND CIRCUITS-I

LIST OF EXPERIMENTS

Experiments based on -

Topic	Nos.
1) Characteristics of Devices (Such as diode BJT, FET etc)	02
2) Rectifiers & Filters	03
3) Transistorized Amplifiers	02
4) Oscillators	03
5) Special Devices	02

Minimum 8 Experiments to be conducted from above. Minimum one experiment from each topic

3SUL3 ELECTRO MAGNETIC FIELDS

SECTION-A

UNIT-I ELECTROSTATICS:

Introduction to cylindrical and spherical coordinate systems. Electric field intensity, flux density, Gauss's law, divergence, divergence theorem, Electric potential and potential gradient.

UNIT-II MAGNETOSTATICS:

Current density and continuity equation, B-S law, Ampere's circuital law and applications, Flux density, Scalar and Vector magnetic potentials. Maxwell's equations for steady fields.

UNIT-III MAXWELL'S EQUATIONS AND BOUNDARY CONDITIONS:

Maxwell's equations for time varying fields. Electric and magnetic boundary conditions.

SECTION-B

UNIT-IV ELECTROMAGNETIC WAVES:

Electromagnetic wave equation, wave propagation in a perfect dielectric, lossy dielectric and perfect conductor. Poynting vector and Poynting theorem. Reflection and refraction of plane wave.

UNIT-V WAVEGUIDES:

Rectangular waveguide, TE, TM, TEM waves in rectangular guides. Bessel functions, TE and TM waves in circular waveguides, wave impedance.

UNIT-VI RADIATION:

Retarded potential, Electric and magnetic fields due to oscillating dipole (Alternating current element), Power radiated and radiation resistance. Application to short monopole and dipole. Power radiated and radiation resistance of quarter wave monopole and half wave dipole.

BOOKS RECOMMENDED:

- 1) Hayt W.H.: "Engineering Electromagnetics", Tata Mc-Graw Hill
- 2) Jordan E.C. and Balmain K.C.: "Electromagnetic Waves and Radiating System" Prentice Hall of India Private Limited, (Second Edition), 1985.
- 3) Krauss J.D.: "Electromagnetics", Mc-Graw Hill Books Co. (Third Edition), 1984.
- 4) Ramo S. & Whinnery R.: "Fields and Waves in Communication Electronics", John Wiley & Sons, New Delhi, 1984.
- 5) Weeks "Electromagnetic Theory for Engineers", (Wiley).

3SUL4 ELECTRICAL ENGINEERING-III

SECTION- 'A'

Unit-I : Measurement of resistance: Kelvin Double Bridge, Loss of change method and megger.

Measurement of Inductance and Capacitance: Maxwell's bridge, Hay's bridge, Anderson's bridge, Schering bridge and Carey Foster bridge. Measurement of Q factor and tan δ .

Unit-II Measurement of active and reactive power in 3-phase balanced and unbalanced load. Electrodynamic type power factor meter, frequency meter. Watt meter.

Unit-III D.C. Motors: Electrical and mechanical characteristics of motor, Speed control methods for constant torque and constant horse power. Performance of D.C. motor under pulsating voltage. Application of D.C. motors.

Braking-resistance and regenerative.

SECTION- 'B'

Unit-IV Induction Motors: Characteristics, Speed control methods: Armature voltage, V/f control, rotor control, slip power recovery scheme and applications, plugging, Resistance braking.

Eddy current coupling, its application.

Unit-V : Transformers: 3 ϕ transformers, rectifier transformers, pulse transformers. Scott connection, Ferrite core transformer. Coils and chokes.

Unit-VI : Construction, principle of operation, characteristics and applications of: Tachogenerator, (DC & AC), Stepper motor, A.C. Servo motor 1 ϕ induction motors and Universal motor. Two dial D.C. potentiometers-Construction & application.

BOOKS:

- i) M.V. Deshpande:- Elements of Electrical Machines.
- ii) A.K. Sawhney:- Electrical and Electronic Measurement and Instrumentation.

REFERENCE BOOKS:

- i) E.W. Golding:- Electrical measurement and measuring Instrument, ELBS Pub.
- ii) First Course on Electrical Drives-S.K. Pillai

PRACTICALS:

Minimum Eight experiments based on above syllabus.

3SUL5 INSTRUMENTATION

SECTION-A

Unit I : Transducer & Instrumentation systems (1)

Transducer classification: Active/Passive. Primary/Secondary. Analog/Digital and transduction Principles.

Basic Signal conditioning Circuits:- Resis/Capacitive/Inductive reactance bridge. Current/Voltage Sensitive Wheatstone bridges & Generalised instrumentation system with particular examples (9 Hrs)

Unit II : Static characteristics, errors & statistical parameters: (1)

Static characteristics: Accuracy, Precision, Sensitivity,

Threshold, Resolution, Repeatability and Hysteresis.

Errors: Gross error, Systematic error, Random error, Limiting error.

Statistical Parameters: Arithmetic mean Average deviation Standard deviation. Probable error, Histogram, Normal & Gaussian curve of errors (7 Hrs)

Unit III : Electronics Instrumentation: (1,2,3):

Analog & Digital data acquisition system, Analog electronic multimeter, Introduction to digital voltmeter & universal counter. Stripchart & X-Y recorders. Optical Encoders. Seismic mass vibration transducer Introductory block diagram of smart sensors. (3) (9 Hrs.)

SECTION-B

Unit IV : Measurement of Temperature & Strain (1,3)

Temperature Sensors: LM335, RTD. THERMISTORS, Thermocouples, Thermocouples laws & its compensation methods.

Pyrometers: Total/Partial radiation & optical pyrometers.

Strain Gauges: Wire factor. Strain measurement & temperature compensation methods.

Unit V : Measurement of Displacement. Pressure & Level.

Displacement Measurement: (1) using resistive, capacitive, inductive (LVDT & RVDT) & Eddy current.

Pressure Measurement: (1)

Elastic, Inductive, Piezoelectric & capacitive transducers, Low pressure measurement using ionization gauge, Pirani gauge, thermocouple vacuum gauge.

Level Measurement: (1,3)

Using ultrasonic, capacitive, inductive, resistive with float, gamma rays & eddy currents techniques. (8 Hrs.)

Unit VI : Measurement of Flow, Humidity, Velocity (1)

Flow Measurement: using ultrasonic, electroacoustic & hot wire Anemometer.

Humidity Measurement : using resistive, Capacitive & Crystal transducers.

Velocity Measurement: Using electroacoustic & photodetectors (both linear & angular velocity)

Practicals Minimum Eight experiments based on above syllabus.

Books Recommended:

- 1) Sawhney A.K.: A course in Electrical/Electronics Measurement & Instrumentation, Dhanpat Rai & Sons., Delhi.
- 2) Rangan C.S., Sharma G.R., & Mani V.S.V.: Instrumentation Devices & System, Tata Mc-Graw Hill.
- 3) Patranbis D. : 'Sensors & Transducers', A.H. Wheeler & company, Prayag, India.

COMMUNICATION THEORY

SECTION-A

SIGNAL AND NOISE :

Audio signals, frequency range for speech and music, sound intensity, loudness, level, frequency response, bandwidth, bandwidth requirement for different types of signals such as telegraph, telephone speech, music and video.

Noise : External and internal noise, noise figure, signal to noise ratio, noise figure measurement.

WAVE PROPAGATOR :

Electromagnetic waves, Sky waves, ground waves, space waves, Ionosphere, critical frequency, maximum suitable frequency, virtual height, fading, single hop and multi hop propagation, duct propagation, skip distance.

ANTENNA:

Principle of radiation, isotropic, radiator, resonant antenna, Half wave dipole antenna, non resonant antenna, antenna arrays, parasitic reflector, parasitic director, folded dipole, yagi-uda antenna, antenna power gain, beam width, polarization, bandwidth and radiation resistance.

SECTION-B

DIFFERENT TYPES OF ANTENNA:

Long wire, helical, rhombic, discone, log periodic, loop antenna, low, medium and high frequency antenna.

RF TRANSMISSION LINE:

Parallel and coaxial transmission line, standing wave, characteristic impedance, quarter wave and half wave length line, Smith chart, stub matching and balun.

ELECTRO-ACOUSTICS:

Microphones: different types of microphone, characteristics, construction and principle, operation of carbon, condenser, electric and moving coil microphone.

Loudspeakers: Different types of loudspeakers, construction and principle of operation of horn-type, moving coil, woofer, tweeter, column speakers, loud speaker enclosures.

RECORDING SYSTEM:

Sound recording, magnetic recording, optical recording, sound reproduction, Hi-Fi system, stereo phony and quadruphony. Introduction to equalizers, Dolby systems concept, Compact Disc recording & reproduction.

BOOKS RECOMMENDED:

- (1) Kennedy G. : "Electronic Communication System" Tata Mc-Graw Hill Co., New Delhi (Third Edition) 1985.
- (2) Collins Dennis, Collins John "Electronic Communications" (PHI)
- (3) Sharma Ajay: "Audio and Video Systems", Dhanpat Rai & Sons, Delhi.

COMPUTER PROGRAMMING AND APPLICATIONS

SECTION-A

Unit I : Principles of object oriented Programming-ops paradigm, basic concept of op's Benefits of op's, structure of C++ Programming, Basic data types, user defined data type, derived data type operator and control statement.

Unit II : Functions classes and object in C++ Functions, Function over loading, Friend and Virtual Functions, Difference between class and structures types of classes and its use concept of object and its implementation, constructor and destructors.

Unit III : Operator's overloading

Operator and their definition, overloading unary and binary operator, Rules for overloading operators, overloading binary operators using friends and string manipulation.

SECTION-B

Inheritance and Polymorphism-

Defining derived classes, single and multiple inheritance, multilevel inheritance, member classes pointer to objects, pointer to derived classes, virtual function.

Unit V : INTRODUCTION TO SPICE/ PSPICE:-

Description, types, circuit elements, sources, Types of analysis, output commands, Format of files.

DC CIRCUIT ANALYSIS : Registers, modelling of elements,

Independent & dependent sources, DC output variables, types of DC analysis.

TRANSIENT ANALYSIS - Capacitors & Inductors, modelling of transient sources, transient Response.

AC CIRCUIT ANALYSIS : AC output variables, AC sources & analysis.

UNIT VI : SPICE COMMANDS & DEVICES SIMULATION :

Advanced commands, modelling, and analysis of diode, BJT & FET

Practicals-

Minimum Eight experiments based on the above syllabus out of which at least four experiments should be based on the last two units.

BOOKS RECOMMENDED :

- 1) Object Oriented Programming with C++ -E. Balaguruswamy, Tata Mc-Graw Hill publishing Co.Ltd., New Delhi,1995.
- 2) Object Oriented Programming in Turbo C++ Rober Lofore Galgotia Publications Pvt.Ltd., New Delhi,1995
- 3) The C++ Programming Language (Third Edition) - Bjarne Stroustrup Pub.Co.,New York,1995 (Addison Wesley)
- 4) C++ Primer - Lipman Stanley B., (Second Edition) New York, Addison Wesley Pub. Company,1995
- 5) SPICE FOR CIRCUITS AND ELECTRONICS USING PSPICE Muhammad H. Rashid. (PHI).

4SULEI3

NETWORK ANALYSIS

SECTION-'A'

- Unit-I : Basic Circuit elements: Circuit components- assumptions for Circuit analysis, sources of electrical energy-standard input signals- Kirchoff's laws-source transformation- mesh and node analysis-network equation for RLC network-magnetic coupling. (10)
- Unit-II : Graph theory and network equation:- Graph of a network-Tress and loops, cut set of a network, Tie-set matrix and loop currents- analysis of network, Network equilibrium

equation,dualit-network trasformation. (10)

Unit-III : Laplace transformation and its applications:- Laplace transformations-basic theorems-gate function-Impulse function-Laplace transform of periodic functions.

Solution of linear differential equations-Heaviside's partial fraction expansion-Solution of network problems.

(10)

SECTION-'B'

Unit-IV : Network theorems:- Superposition theorem-Reciprocity theorem, Thevenin's theorem-Norton's theorem-Milliaman's theorem-Max. power transfer theorem-Substitution theorem-Compensation theorem, Tellegen's theorems.

(10)

Unit V : Twoport network:- Open circuit impedance parameters-short circuit admittance parameters-Transmission parameters-Inverse transmission parameters-Hybrid and inverse hybrid parameters. interrelationship between the parameters-two port symmetry interconnection of two port networks, input impedance in terms of two-port parameters output impedance- image impedance. (10)

Unit-VI : Network functions:- Ports and terminal pairs-network functions-poles and zeros-necessary conditions for driving point function-necessary conditions for transfer function-Applications of network analysis in driving network functions-positive real functions-driving point and transfer impedance function-LC net work (10)

TEXT BOOK :

Network and systems-D,Roy Choudhary (Wiley Eastern Ltd.1988)

REFERENCES-

1. Circuit Theory-ISKV Iyer (Tata Mcgraw Hill)
2. Network Analysis, M.E.Van Valkenburg (Prentice Hall India) 3rd Ed.

PRACTICALS-

About 10 experiments based on above syllabus.

4SRULEI4 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, Characteristics 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 comparison of different alternative projects. (10)

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.

4SUL5 COMPONENTS AND DEVICES TECHNOLOGY**SECTION-A**

- Unit-I Electronic passive components
Resistors, Capacitors-types, construction, selection procedure and failures.
Testing of devices - diode, transistor, FET.
- Unit-II i) Switches and relays- types, construction, specifications, applications and testing.
ii) Fuses, Cables and connectors - types, construction, specifications and applications.
iii) Analysis and Design of heat sinks, choke and transformer.
- Unit-III Structure and properties of Si, Ge and GaAs. Preparation, purification by zone refining and single crystal growth by CZ method for Si, Ge and GaAs.
Cutting of crystal, cementing of slices and ingots, lapping and polishing.

SECTION-B

- Unit-IV (a) Measurements and Etching:
Determination of conduction type by Hall effect. Resistivity measurement by two probe, four probe method Etching - Types, Electrolytic etching and etchants for Si and Ge. Photoengraving.
(b) Formation of P-N junction by i) Alloying ii) Diffusion iii)

Epitaxy and iv) Ion-implantation. Significance and formation of ohmic contact by welding (Electric and Ultrasonic welding) and thermocompression bonding.

Protection of P-N junction by Oxidation and using dessicants.

Unit-V : Planar technology for P-N junction diode and transistor.

Hermetic encapsulation of devices.

Properties of monolithic integrated circuits, characteristics of integrated components, Monolithic integrated diodes, resistors, capacitors, transistors and FETs, Introduction to various technologies SSI, MSI, LSI, VLSI, ULSI.

Unit VI : Basics of Electronic component layout. Printed circuit boards Material, Properties and specifications. Basic manufacturing process of PC Board, Soldering techniques.

Reference:

- 1) VLSI technology, S.M. Sze.
- 2) Modern Electronic Equipments, R.S.Khandpur (TMH)
- 3) Electronics Testing & Fault Diag - "G.C.Loveday (Wheeler)
- 4) VLSI Fabrication principles, 'Silicon and Gallium Arsenide'
S.K.Ghandhi
- 5) Printed circuit boards: W.C.Bosshart (TMH)
- 6) Semiconductor Devices Technology, Dr.A.A.Ghatol.
- 7) Basic of Electronic Devices Technology,
Dr.(Mrs.)S.D.Wakde and Mrs. V.V.Gohokar
- 8) Solid State Electronics Devices, Streetman.

PRACTICALS:- Minimum six practicals out of which at least two should be based on PCB layout design using any standard software package.

APPENDIX-B
FOUR YEAR B.E. DEGREE COURSE
SEMESTER PATTERN
SEMESTER : THIRD

L : Theory Lecture
T : Tutorial
P : Practical
D : Drawing / Design

BRANCH : ELECTRONICS AND TELECOMMUNICATION/INDUSTRIALELECTRONICS

ABBREVATIONS :-
S - SEMESTER PATTERN
U - Electronics & Tele.
L - Industrial Electronics
I - Instrumentation
E - Electrical
R - Computer Sc.& Engg.

Sr. No.	Sub. Code	SUBJECT	Teaching Scheme			Examination Scheme									
			L	T	P/D	Theory					Practical				
No.	No.					Total Hours/Week	Duration of Papers (Hrs)	Max. Marks Theory Papers	Maximum Marks College Assessment	Total	Min. Pass Marks	Max. Marks External	Max. Marks Internal	Total Marks	Minimum Pass Marks
1.	3SULI1	Mathematics-III	4	1	-	5	3	80	20	100	40	—	—	—	—
2.	3SULI2	Electronic Devices & Circuits -I	4	1	2	7	3	80	20	100	40	25	25	50	25
3.	3SUL3	Electromagnetic Fields	4	1	-	5	3	80	20	100	40	—	—	—	—
4.	3SUL4	Electrical Engineering-III	4	1	2	7	3	80	20	100	40	25	25	50	25
5.	3SUL5	Instrumentation	4	-	2	6	3	80	20	100	40	25	25	50	25
TOTAL			20	5	6	31				500				150	

GRAND TOTAL : 650

SEMESTER : FOURTH
BRANCH : ELECTRONICS AND TELECOMMUNICATION/INDUSTRIALELECTRONICS

Sr. No.	Sub. Code	SUBJECT	Teaching Scheme			Examination Scheme									
			L	T	P/D	Theory					Practical				
No.	No.					Total Hours/Week	Duration of Papers (Hrs)	Max. Marks Theory Papers	Maximum Marks College Assessment	Total	Min. Pass Marks	Max. Marks External	Max. Marks Internal	Total Marks	Minimum Passing Marks
1.	4SUL1	Communication Theory	4	1	-	5	3	80	20	100	40	--	--	--	--
2.	4SULI2	Computer Programming & Applications.	4	1	2	7	3	80	20	100	40	25	25	50	25
3.	4SULEI3	Network Analysis	4	1	2	7	3	80	20	100	40	25	25	50	25
4.	4SRULEI4	Social Science and Engineering Economics	4	-	-	4	3	80	20	100	40	—	—	—	—
5.	4SUL5	Components & Device Technology.	5	-	2	7	3	80	20	100	40	25	25	50	25
TOTAL			21	3	6	30				500				150	

GRAND TOTAL : 650

% REGULATION NO. 13 OF 2002

Examinations leading to the Degree of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.... Semester Pattern) Regulation, 2002.

Whereas it is expedient to frame the Regulation in respect of Examinations leading to the Degree of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.....Semester Pattern) for the purposes hereinafter appearing the Management Council is hereby pleased to make a following Regulation.

1. This regulation may be called “Examinations leading to the Degree of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.... Semester Pattern) Regulation, 2002.
2. This Regulation shall come into force w.e.f. the Academic session-
 - i) 2000-01 for Ist & IInd Semester B.E.,
 - ii) 2001-02 for IIIrd & IVth Semester B.E.,
 - iii) 2002-03 for Vth & VIth Semester B.E., and
 - iv) 2003-04 for VIIth & VIIIth Semester B.E.
3. The Schemes of Teachings and Examinations for Ist & IInd, IIIrd & IVth, Vth & VIth, and VIIth & VIIIth Semester in respect of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.... Semester Pattern) shall be as per Appendices-A, B, C, and D appended with this Regulation respectively.

% As amended by Regulation Nos. 32 of 2003 & 16 of 2007.

Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005

Whereas it is expedient to frame an Ordinance relating to Examination in Environmental Studies leading to Bachelor Degree level, hereinafter appearing, the Management Council is hereby pleased to make the following Ordinance.

1. This Ordinance may be called "Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005."
2. This Ordinance shall come into force from the Academic session 2005-06.
3. In this Ordinance and in other ordinances relating to the examination, unless there is anything repugnant in the subject or context :-
 - (i) "Academic session" means a session commencing on such date and ending with such date of the year following as may be appointed by the Management Council.
 - (ii) "Admission to an examination" means the issuance of an admission card to a candidate in token of his having complied with all the conditions laid down in the relevant ordinance, by a competent officer of the University.
 - (iii) "Applicant" means a person who has submitted an application to the University in the form prescribed for admission to an examination.
 - (iv) "Candidate" means a person who has been admitted to an examination by the University.
 - (v) "Regular Candidate" means an applicant who has applied for admission to a University examination through an affiliated college, Department or Institute in which he/she has prosecuting a regular course of study.
 - (vi) "Examinee" means a person who present himself/herself for an examination to which he/she has been admitted.
 - (vii) "Examination" means an examination prescribed by the University under the relevant Ordinance.
 - (viii) "External Candidate" means a candidate who is allowed to take a University examination in accordance with the provision of Original Ordinance No. 151.
 - (ix) " Non-Collegiate Candidate" means a candidate who is not a collegiate candidate.

- (x) An "Ex-student" is a person who having once been admitted to an examination of this University, is again required to take the same examination by reason of his failure or absence thereat and shall include a student who may have joined a college, Department or Institute again in the same class.
 - (xi) "Bachelor Degree Examination" means an examination leading to Bachelor Degree of the University.
 - (xii) "Previous Year" means a year following by final year of Bachelor Degree.
4. Save as otherwise specifically provided, the conditions prescribed for admission to the examination under this Ordinance shall apply to all persons who wish to take the examination to the Degrees of the University mentioned in para 5 below.
 5. The conditions prescribed for admission to examination under this Ordinance shall apply to following degrees of the University :-
 - 1) Bachelor of Arts
 - 2) Bachelor of Performing Arts
 - 3) Bachelor of Fine Arts
 - 4) Bachelor of Mass Communication
 - 5) Bachelor of Social Work
 - 6) Bachelor of Commerce
 - 7) Bachelor of Business Administration
 - 8) Bachelor of Science
 - 9) Bachelor of Computer Science
 - 10) Bachelor of Computer Applications
 - 11) Bachelor of Pharmacy
 - 12) Bachelor of Science (Home Science)
 - 13) Bachelor of Technology (Cosmetics)
 - 14) Bachelor of Engineering
 - 15) Bachelor of Engineering (Part Time) (Civil)
 - 16) Bachelor of Textile
 - 17) Bachelor of Technology (Chemical Technology)
 - 18) Bachelor of Technology (Chemical Engg.)
 - 19) Bachelor of Architecture, and
 - 20) Bachelor of Laws (Five Year Course)
 6. i) Environmental Studies shall be a compulsory subject for a previous year examination of the following Bachelor Degrees of the University,
 - 1) Bachelor of Arts
 - 2) Bachelor of Performing Arts
 - 3) Bachelor of Fine Arts
 - 4) Bachelor of Mass Communication

- 5) Bachelor of Social Work
 - 6) Bachelor of Commerce
 - 7) Bachelor of Business Administration
 - 8) Bachelor of Science
 - 9) Bachelor of Computer Science
 - 10) Bachelor of Computer Applications
 - 11) Bachelor of Pharmacy
 - 12) Bachelor of Science (Home Science)
 - 13) Bachelor of Technology (Cosmetics)
 - 14) Bachelor of Engineering (Part Time) (Civil)
- ii) Environmental Studies shall be a compulsory subject for IIIrd & IVth Semester of the following Bachelor Degrees of the University,
- 1) Bachelor of Engineering
 - 2) Bachelor of Textile
 - 3) Bachelor of Technology (Chemical Technology)
 - 4) Bachelor of Technology (Chemical Engineering)
 - 5) Bachelor of Architecture, and
- iii) Environmental Studies shall be a compulsory subject for Vth & VIth Semester of the Degree of Bachelor of Laws (Five Year Course)
- iv) Students admitted to Second Year/Third Year/IVth Semester/ VIth Semester of various degree examination courses in different Faculties in the academic session 2005-06 or thereafter shall have to appear for examination in the subject Environmental Studies.
7. The main examination leading to Environmental Studies shall be held in Summer and supplementary examination in Winter every year, at such places and on such dates as may be appointed by Board of Examinations.
Explanation:- Examination shall be conducted on the basis of one common question paper for all Bachelor Degree Examination courses irrespective of annual or semester pattern.
8. Scope of the subject for annual pattern examination and or semester pattern examination shall be as provided under the syllabus.
9. Common question paper for all courses covered under this Ordinance alongwith answer books shall be supplied by the University to the Colleges, Departments and Institutes for conducting the examination of the subject.
10. Valuation of the answer books relating to this subject shall be done at College/Department/Institution level only. Remuneration for valuation of answer books shall not be paid by the University.
Provided that prescribed evaluation fee for evaluation of each answer

book/s of an external examinee/s appeared from the examination centre shall be paid to each examination centre.

11. It shall be obligatory on the part of the College/Department/Institute to submit candidate wise following information to the University on or before the date as may be prescribed by the University :-

Sr. No.	Grade/Category	Marks secured
1.	“A”	- 60 and above
2.	“B”	- 45 to 59
3.	“C”	- 35 to 44
4.	“D”	- 25 to 34
5.	“Fail”	- 24 and below
6.	“Absent”	

12. For the purposes of teaching, learning and examination, the Committee consisting of three teachers shall be appointed by the Principal/ Head of the Department/Head of the Institution under his/her Chairmanship/ Chairpersonship. While appointing three teachers on the said committee, the Principal shall take care that the teachers to be appointed on the committee, if necessary, shall be from different faculty.
13. i) Duration of theory examination of this subject shall be three hour.
ii) For all Bachelor Degree examinations, common question paper of 100 marks shall be provided by the University.
iii) Distribution of these 100 marks shall be as follows :-
- | | | |
|---|---|----------|
| a) Part-A, Short Answer Pattern | - | 25 Marks |
| b) Part-B, Essay type with inbuilt choice | - | 50 Marks |
| c) Part-C, Essay on Field Work | - | 25 Marks |
14. Medium of instruction shall be English or Marathi or Hindi. Question paper shall be supplied in English and Marathi and Hindi. A candidate shall have option to write answers in English or Marathi or Hindi.
15. Examination for the subject Environmental Studies shall be compulsory for external candidates appearing as a fresh candidate at Winter and/or summer examination.
16. For teaching of the subject, there shall be atleast two hour per week. For teaching the subject to the regular candidates, a full time approved teacher of the University and or a person having Postgraduate Degree in any faculty with second class shall be considered eligible.
17. For teaching of the subject, additional fee to be charged to regular

candidate shall be as prescribed by the University.

18. Every College/ University Teaching Department shall charge additional fee of Rs. 100/- to every Student of the subject Environmental studies. Out of this Rs. 100/-, the College/University Teaching Department shall have to pay Rs. 25/- to the University as an examination fee of each candidate for the subject environmental studies.
19. The Grade secured by an examinee in the examination of this subject shall not be considered for providing the facility of A.T.K.T. in next higher class.
20. The provisions of Ordinance No. 18/2001 shall not be applicable for securing a grade or higher grade in the examination of this subject.
21. Result of the Final Year of the respective Degree shall not be declared of an examinee unless he/she secures any one of the grade in the examination of subject.

Provided an examinee admitted to Five Year LL.B. course desiring not to continue his/her education beyond Sixth Semester of the said course shall have to secure any one of the grade in the examination of the subject otherwise his/her result of Sixth Semester for awarding B.A. degree shall not be declared.

22. Certificate shall be issued, to the successful examinees in the subject Environmental Studies, after the examination.

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)

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.
- 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.

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 - 9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Mumbai **(R)**
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 - 17) Sharma B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
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 - 23) डॉ. विठ्ठल घारपुरे : पर्यावरणशास्त्र- पिंपळापूर अॅन्ड कंपनी पब्लिशर्स, नागपूर.**(R)**
 - 24) Dr. Deshpande, A.P., Dr. Chudiwale, A.D., Dr. Joshi, P.P., Dr. Lad, A.B.: Environmental Studies, Pimpalpure & Co., Publishers, Nagpur. **(R)**

(M) Magazine

(R) Reference

(TB) Textbook
