



ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Guwahati

Course Structure and Syllabus

APPLIED ELECTRONICS AND INSTRUMENTATION (AEI) SEMESTER VII / AEI /B.TECH

Sl. No.	Sub Code	Subject	Hrs/week			Credits C
			L	T	P	
Theory						
1	EC131701	Linear Integrated Circuits	3	2	0	4
2	AI131702	Fiber Optic Instrumentation	3	0	0	3
3	AI131703	Introduction to Digital System Design	3	0	0	3
4	AI131704	Remote Control and Telemetry	3	0	0	3
5	AI1317E01	Elective-I (Departmental)	3	0	0	3
6	HS1317E02	Elective-II (Humanities)	2	0	0	2
Practical						
7	AI131712	Fiber Optic Instrumentation Lab	0	0	2	1
8	AI131713	Introduction to Digital System Design Lab	0	0	2	1
9	AI131717	Project-1	0	0	8	4
10	AI131721	Seminar on Summer Training	0	0	0	1
Total			17	2	12	25
Total Contact Hours : 31						
Total Credit : 25						

Elective-I Subjects		
Sl. No.	Subject Code	Subject
1	AI1317E011	Embedded System
2	AI1317E012	Power Plant Instrumentation
3	AI1317E013	Electrical Machines
4	EE1317E014	Optimization Techniques
5	AI1317E015	Any other subject offered from time to time with the approval of the University

Elective-II Subjects		
Sl. No.	Subject Code	Subject
1	HS1317E021	Value Education, Human Rights and Legislative Procedure
2	HS1317E022	Values and Ethics in Profession
3	HS1317E023	Organizational Behaviour
4	HS1317E024	International Business and Intellectual Property Rights
5	HS1317E025	Any other subject offered from time to time with the approval of the University

Course Title : LINEAR INTEGRATED CIRCUITS

Course Code: EC131701

L-T-P-C: 3-2-0-4

Class Hours/week	4
Expected weeks	12
Total hrs. of classes	36+12 =48

MODULE	TOPIC	COURSE CONTENT	HOURS
1	INTRODUCTION	Op-amp block diagram, symbol, and equivalent diagram, pin diagram, ideal Op-amp, voltage transfer characteristics, dc characteristic: input bias, offset current, offset voltage, Offset error compensation, thermal drift, ac characteristics: frequency response, frequency compensation, slew rate, noise, CMRR.	8
2	NEGATIVE FEEDBACK	Op-amp as inverting, non-inverting amplifier, voltage follower, loading effect, adder, differential, integrator, differentiator, powering op-amp.	6
3	CURRENT TO VOLTAGE CONVERTERS	V-I converters (floating load and grounded load), Current amplifiers, instrumentation amplifier, Log/Antilog Amplifier, Analog multipliers, Electronic analog computation.	6
4	COMPARATORS	Voltage limiter, level detectors, window detectors, ON/OFF temperature controller, pulse width modulation, Schmitt trigger, Precision half wave and full wave rectifiers Peak detectors. Sample and hold circuits, clipper, and clamper.	7
5	SINE WAVE GENERATORS	555 timer, multivibrators, Triangular wave generator, Saw-tooth generator, Voltage to frequency and frequency to voltage converters.	7
6	PERFORMANCE PARAMETERS	Zener and Avalanche diode voltage references, Compensation methods, Series regulators, IC Voltage Regulators.	4
7	CONVERTER DEFINITIONS AND SPECIFICATIONS	Basic DAC techniques, Flash/Parallel, counter type, SAR AD converters.	4
8	PHASE-LOCKED LOOP (PLL), VOLTAGE CONTROLLED OSCILLATOR (VCO)	Phase-Locked Loop (PLL), Voltage Controlled Oscillator (VCO)	2
9	FIRST ORDER ACTIVE FILTERS, SECOND ORDER RESPONSE	Low-pass, high-pass, band pass and notch, KRC filters, multiple-feedback filters.	4
TOTAL			48

TEXTBOOKS / REFERENCES:

1. Nergio Franco - Design with Operational Amplifiers and Analog Integrated Circuits, McGraw Hill Book Company.
2. R.F.Coughlin, F.F.Driscoll - Operational Amplifier and Linear Integrated Circuits, Prentice Hall of India.
3. Ramakant A. Gayakwad- Op-Amps and Linear Integrated Circuits, PHI.
4. D.Roy Choudhury and S. B. Jain- Linear Integrated Circuits, New Age Int.
5. Salivahanan: Linear Integrated Circuits, TMH.

Course Title : FIBER OPTIC INSTRUMENTATION

Course Code: AI131702

L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

MODULE	TOPIC	COURSE CONTENT	HOURS
1	OPTICAL FIBRES AND THEIR PROPERTIES	Principles of light propagation through a fibre - Different types of fibres and their properties, Modes in optical fibers, Step index and Graded index fiber, Fibre characteristics ; Absorption losses; Scattering losses ; Dispersion ; Connectors and splicers ; Fibre termination ; Optical sources ; Optical detectors.	8
2	INDUSTRIAL APPLICATION OF OPTICAL FIBRE	Fibre optic sensors – Fibre optic instrumentation system – Different types of modulators – Interferometric method of measurement of length – Moire fringes – Measurement of pressure, temperature, current, voltage, liquid level and strain.	8
3	LASER FUNDAMENTALS	Fundamental characteristics of lasers – Three level and four level lasers – Properties of laser – Laser modes – Resonator configuration – Q-switching and mode locking – Cavity damping – Types of lasers – Gas lasers, solid lasers, liquid lasers, semiconductor lasers.	6
4	INDUSTRIAL APPLICATION OF LASERS	Laser for measurement of distance, length, velocity, acceleration, current, voltage and atmospheric effect – Material processing – Laser heating, welding, melting and trimming of material – Removal and vaporization.	7
5	HOLOGRAM AND MEDICAL APPLICATIONS	Holography – Basic principle – Methods of formation of holograms – Holographic interferometry and application, Holography for non-destructive testing – Holographic components – Medical applications of lasers, laser and tissue interactive – Laser instruments for surgery, removal of tumors of vocal cards, brain surgery, plastic surgery, gynaecology and oncology.	7
TOTAL			36

TEXTBOOKS / REFERENCES:

1. R.P.Khare, Fiber Optics and Optoelectronics, Oxford university press.
2. J. Wilson and J.F.B. Hawkes, Introduction to Opto Electronics, Prentice Hall of India.
3. Optics: Ghatak, TMH
4. Opto-electronics: An Introduction – Wolf and Smith, PHL
5. An Introduction to Fibre Optics – Shotwell; PHI (EEE)

**Course Title : INTRODUCTION TO DIGITAL SYSTEM
DESIGN**

Course Code: AI131703

L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

MODULE	TOPIC	COURSE CONTENT	HOURS
1	Synthesis of clock mode (synchronous) sequential circuits	Analysis of sequential circuits. Design procedure with synthesis of state diagrams Mealy and Moore machines. Partitioning and state assignment. Finite state machine model.	7
2	Asynchronous sequential circuit design	Analysis and design of asynchronous sequential circuit, Primitive flow table, concept of race, critical race and hazards.	6
3	VHDL	Introduction to VHDL, Basic language elements, dataflow modeling, behavioral modeling, structural modeling, Design of combinational circuit using VHDL, Design of sequential circuit using VHDL.	9
4	Design Convention	Register transfer, biasing and sequencing of control. Electronic realization of hardwired control unit. Conditional transfer.	6
5	AHPL	Introduction to AHPL, AHPL operators, operand convention of AHPL, AHPL conventions for combinational logic and memory arrays.	4
6	RIC	Basic organization, register transfer and AHPL control programmes. Multiple cycle instructions.	4
TOTAL			36

RECOMMENDED BOOKS:

1. J. Frederic and G. R. Peterson - Digital Systems: Hardware Organization and Design, John Wiley and Sons, 3/e.
2. F. J. Hill and G. R. Peterson - Switching Theory and Logical Design. John Wiley and Sons, 3/e.
3. VHDL Primer- J. Bhasker.
4. Circuit design with VHDL-V.Pedroni. Digital Circuits and Logic Design – Samuel C. Lee, PHI.

Course Title : REMOTE CONTROL AND TELEMTRY
Course Code: AI131704
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

MODULE	TOPIC	COURSE CONTENT	HOURS
1	PURPOSE OF TELEMTRY	Basic scheme, voltage, current and frequency telemtry; line length limitations. Concepts of Information transfer: bits, symbols, codes -source, line, channel, BCD, ABCII, BAUDOT, AMI, CMI, Manchester, HDBM, Block, Differential, Hamming, Conduction.	7
2	MODULATION CODES	PAM, PFM, PTM, PCM 2; Bit error rate; Inter symbol, noise, parity checking 3 ; Review of modulation and multiplexing: FM-AM, FM-FM, PAM-AM, PAM-FM, PCM-AM, etc. Quantization and conversion methods; error in quantization, bandwidth consideration.	7
3	FDM SYSTEMS	IRIG standards in FDM systems in FDM telemtry; SCO's ; Mux and Demux circuits; Detectors and Demodulators; Pulse averaging, Quadrature FM and PLL, Mixers, TDM systems (architecture)- TDM- PAM, PAM- PM, TDM- PCM systems; synchronization ; PCM generation; differential PCM, PCM reception and detection.	10
4	MODEMS	Digital modulation and Shift-keying, FSK, PSK, DPSK, QPSK, QAM, Modem Protocol; Satellite telemtry, TT and C services; subsystems; The earth station.	8
5	FIBER OPTIC TELEMTRY	The optical fibre as transmission medium; Interconnections; Repeaters; Sources; Detectors; WDM, Remote control: concept and example from a typical industrial operation.	4
TOTAL			36

TEXTBOOKS / REFERENCES:

1. D. Patranabis, Telemetry principles, TMH, New Delhi
2. E. L. Gruenberg, Handbook of Telemetry and Remote control, Mc Graw Hill
3. A. S. Tanenbaum, Computer Networks, Pearson

Course Title : ELECTIVE-I (Departmental)

Course Code: AI1317E011

L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

EMBEDDED SYSTEM

MODULE	TOPIC	COURSE CONTENT	HOURS
1	INTRODUCTION	What is an embedded system? Overview of embedded systems, embedded system design challenges. Embedded hardware units and devices in a system, Embedded software in a system, Examples of embedded systems, Classification of embedded systems. Processor and memory organization, processor and memory selection.	4
2	DEVICES AND COMMUNICATION BUSES FOR DEVICE NETWORKS	I/O Types and Examples, Serial Communication Devices, Parallel Port Devices, Interfacing Features in Device Ports, Wireless Communication Devices, Timer and Counting Devices, Watchdog Timers, Real Time Clocks. Parallel communication network using the ISA, pci, pci-x and advanced buses.	10
3	INTERRUPTS	Interrupt service routine, Interrupt latency. Polled I/O issues. Thread and device driver concept. Interrupt sources; Interrupt servicing (handling) mechanism, Shared Data Problem, Multiple interrupts, Context and the periods for context switching, interrupt latency and deadline. Preemptive and non-preemptive multitasking. Critical section. Survey of software Architecture, Round Robin, Round Robin with Interrupts, function Queues, scheduling. Direct memory access. Device driver programming, Parallel port device drivers in a system. Serial port device drivers in a system, Timer devices.	10
4	REAL TIME OPERATING SYSTEM	Embedded operating system, Comparison with general purpose OS. RTOS Tasks, states, Semaphores and shared data. Concept of semaphores, problem of sharing data by multiple tasks and routines, inter process communication. More operating systems services - Message Queues, mail Boxes, timers, events, memory management, synchronisation, control blocks. Scheduling: conventional scheduling, deadline driven scheduling, rate monotonic scheduling, deadlock, watchdog timer. Encapsulating semaphores and Queues. Hardware software co-	12

		design aspects in embedded systems. RTOS programming: Micro C/OS-II and Vx Works, Types of real- time operating systems, RTOS mC/OS-II, RTOS Vx Works.	
TOTAL			36

TEXT BOOKS / REFERENCES:

1. Raj Kamal, Embedded systems. Architecture, programming and design, Tata McGraw Hill.
2. An Embedded software Primer - David E. Simon: Pearson Education.
3. Jonathan W Valvano, Embedded Microcomputer systems, Real time interfacing, Thomson Brooks/col.
4. Raj Kamal, Microcontrollers architecture, programming, interfacing and system design, pearson education.
5. Embedded System Design: A Unified Hardware/Software Introduction – Frank Vahid, Tony Givargis, John Wiley & Sons, Inc.
6. Embedded Systems Architecture – A Comprehensive Guide for Engineers and Programmers , Tammy Noergaard, Elsevier Publication.
7. Embedded C programming, Barnett, Cox & O’cull, Thomson.
8. Shibu, Introduction to to Embedded Systems, TMH.

Course Title : ELECTIVE-I (Departmental)
Course Code: AI1317E012
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

POWER PLANT INSTRUMENTATION

MODULE	TOPIC	COURSE CONTENT	HOURS
1	OVERVIEW OF ELECTRICAL POWER GENERATION	Methods of Power Generation: Hydro, Coal-fired thermal, Natural Gas-based, Solar and Wind Power. Block/Schematic diagram. Major components. Operation. Co-generation. Importance of instrumentation in power generation.	8
2	MEASUREMENTS IN POWER PLANTS	Electrical Measurements: Current, voltage, power, frequency, power factor etc. Non-electrical parameters: Flow of feed water, fuel, air, steam with correction factor for temperature, Steam pressure and temperature, Drum level measurement, Radiation detector, Smoke density measurement, Dust monitor.	7
3	ANALYSERS IN POWER PLANTS	Flue gas-oxygen analyser, Analysis of impurities in feed water and steam, Dissolved oxygen analyser, Chromatography, pH meter, Fuel analyser, pollution monitoring instruments.	7
4	CONTROL LOOPS IN BOILER	Combustion control: Air/fuel ratio control, Furnace draft control, Drum level control, Main steam and reheat steam temperature control, Super heater control, Air temperature-Defecator control, Distributed control system in power plants, Interlocks in boiler operation.	7
5	TURBINE MONITORING AND CONTROL	Speed, vibration, Shell temperature monitoring and control. Steam pressure control. Lubricant oil temperature control. Cooling system.	7
TOTAL			36

RECOMMENDED BOOKS:

1. Dukelow, Sam G.; The Control of Boilers; Instrument Society of America.
2. Nag, P.K.; Power Plant Engineering; Tata McGraw Hill.
3. Elonka, S.M., Kohal, A.L.; Standard Boiler Operations; Tata McGraw Hill, New Delhi.
4. Jain, R.K.: Mechanical and Industrial Measurements, Khanna Publishers, New Delhi.
5. Wakil, E.Al.; Power Plant Engineering, Tata McGraw Hill.
6. Arora, S.C., Domkumdwar,S., Domkumdwar,A.V.; A course in Power Plant Engineering; Dhanpat Rai ; New Delhi.
7. Sharma, P.C.; Power Plant Engineering; Pub: S.K. Kararia; New Delhi.

Course Title : ELECTIVE-I (Departmental)
Course Code: AI1317E013
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

ELECTRICAL MACHINES

MODULE	TOPIC	COURSE CONTENT	HOURS
1	D.C.MACHINES	Constructional features and principles of operation; Classification; e.m.f. equation; Performance characteristics and applications of shunt, series and compound generators. D.C motors: Torque equation; Performance characteristics and applications of D.C. motors. Starting: 3-point and 4-point starters. Speed control: Field control and armature control, Static control of D.C. motors, Braking, Losses and efficiency.	12
2	TRANSFORMER	Constructional features and principles of operation: Transformer equation; Phasor diagram on No-load and on load. Equivalent circuit. Voltage regulation. Losses and efficiency.	6
3	INDUCTION MOTORS	Constructional features and principles of operation. Slip. Equivalent circuit. Energy flow diagram. Torque-speed characteristic. Starting: Autotransformer, Star-delta and rotor resistance. Braking. Speed control: V/f control, External voltage injection. Static control of 3-phase induction motors. 1-phase induction motor: Constructional features and operating principle. Speed-torque characteristic. Split-phase starting.	10
4	SYNCHRONOUS MACHINES	Constructional features: Turbo- and water-wheel alternators. E.M.F. equation (for round-rotor machines). Equivalent circuit, Synchronous impedance; Voltage regulation: E.M.F. and M.M.F. methods. Synchronization. Synchronous motors: Operating principle. Phasor diagram. Methods of starting. Application of synchronous motor in industries.	8
TOTAL			36

RECOMMENDED BOOKS:

1. Say, M.G.; Performance and Design of A.C. Machines; English Language Book Society.
2. Langdorf, A.S.; Theory of Alternating Current Machines; Mc-Grow Hill
3. Langdorf, A.S.; Principles of Direct Current Machines; Mc-Grow Hill.
4. Kothari, D.P. Nagrath, I.J.; Electric Machines, TMG Education Pvt. Ltd.
5. Mukherjee, P.K. & Chakravorty, S.; Electrical Machines ; Dhanpat Rai Publications.
6. Gupta, J.B.; Theory and Performance of Electrical Machines; S.K.Kataria Sons.
7. Gupta, B.R. & Singhal, V.; Fundamentals of Electric Machines; New Age International Publishers.
8. Ghosh, S.; Electrical Machines; Pearson
9. Muruges Kumar, K.; D.C.Machines and Transformer; Vikash Publishing House.
10. Muruges Kumar, K.; Induction and inchronous Machines; Vikash Publishing House

Course Title : ELECTIVE-I (Departmental)
Course Code: EE1317E014
L-T-P-C: 3-0-0-3

Class Hours/week	3
Expected weeks	12
Total hrs. of classes	36

OPTIMIZATION TECHNIQUES

MODULE	TOPIC	COURSE CONTENT	HOURS
1	INTRODUCTION TO OPTIMIZATION	Introduction, Historical development, Engineering Application of Optimization, Statement of an Optimization problem-Design Vector, Design Constraints, Constraint Surface, Objective Function Surfaces. Classification of Optimization Problems, Optimization techniques, Engineering Optimization Literature. Problems	8
2	CLASSICAL OPTIMIZATION TECHNIQUES	Introduction, single variable Optimization, multi-variable Optimization with no constraints, multivariable Optimization with equality constraints, multivariable Optimization with inequality constraints, convex programming problems.	7
3	LINEAR PROGRAMMING I: SIMPLEX METHOD	Introduction, Application of Linear Programming, Standard form of a Linear Programming Problem, Geometry of a Linear Programming Problems, Definitions and Theorem, Solution of a system of Linear simultaneous equation, Pivotal reduction of a general system of equation, motivation of the simplex method, Simplex algorithm, two phases of the simplex method	7
4	LINEAR PROGRAMMING II: ADDITIONAL TOPICS AND EXTENSIONS	Revised simplex method, duality in linear programming, decomposition principle, sensitivity or postoptimality analysis, Transportation problem, Karmarkar's Method, quadratic programming.	7
5	NON-LINEAR PROGRAMMING: ONE DIMENSIONAL MINIMIZATION METHODS	Introduction, unimodal function, Unrestricted search, exhaustive search, dichotomous search, Interval Halving method, Fibonacci method.	7
TOTAL			36

TEXTBOOKS / REFERENCES:

1. Optimization Theory and Application – SS Rao, Wiley Eastern Ltd, 3rd edition.
2. Optimization Techniques-Chander Mohan, Kusum Deep, New Age Science.
3. Optimization Techniques-Paban Kumar Oberoi, Global Vision Publishing House.
4. Computer based Optimization Techniques-Tanweer Alam- A.B.Publications.
5. Operation Research-An Introduction-TAHA H A,Prentice Hall.

Course Title : ELECTIVE-II (Humanities)

Course Code: HS1317E021

L-T-P-C: 2-0-0-2

Class Hours/week	2
Expected weeks	12
Total hrs. of classes	24

VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURE

MODULE	TOPIC	COURSE CONTENT	HOURS
1	VALUES AND SELF DEVELOPMENT	Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles, Value judgments. Importance of cultivation of values, Sense of duty, Confidence, National unity, Patriotism, Love for nature, Discipline. Devotion, Self reliance.	5
2	PERSONALITY AND BEHAVIOUR DEVELOPMENT	Soul and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation	4
3	CHARACTER AND COMPETENCE	Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control	4
4	HUMAN RIGHTS	Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups.	5
5	LEGISLATIVE PROCEDURES	Indian constitution, Philosophy, fundamental rights and duties, Legislature, Executive and Judiciary, Constitution and function of parliament, Composition of council of states and house of people, Speaker, Passing of bills, Vigilance, Lokpal and functionaries.	6
TOTAL			24

TEXTBOOKS:

1. Chakraborty, S.K., Values and Ethics for Organizations Theory and Practice, Oxford University Press, New Delhi.
2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi.
3. Basu, D.D., Indian Constitution, Oxford University Press, New Delhi.

REFERENCE BOOKS:

1. Frankena, W.K., Ethics, Prentice Hall of India, New Delhi.
2. Meron Theodor, Human Rights and International Law Legal Policy Issues, Vol. 1 and 2, Oxford University Press, New Delhi.

Course Title : ELECTIVE-II (Humanities)

Course Code: HS1317E022

L-T-P-C: 2-0-0-2

Class Hours/week	2
Expected weeks	12
Total hrs. of classes	24

VALUES AND ETHICS IN PROFESSION

MODULE	TOPIC	COURSE CONTENT	HOURS
1	EFFECTS OF TECHNOLOGICAL GROWTH	<p>Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits of growth: sustainable development</p> <p>Energy Crisis: Renewable Energy Resources</p> <p>Environmental degradation and pollution. Eco-friendly Technologies. Environmental Regulations, Environmental Ethics</p> <p>Appropriate Technology Movement of Schumacher; later developments Technology and developing notions. Problems of Technology transfer, Technology assessment impact analysis.</p> <p>Human Operator in Engineering projects and industries. Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology.</p>	12
2	ETHICS OF PROFESSION	<p>Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and ethical responsibilities of Technologists. Codes of professional ethics. Whistle blowing and beyond, Case studies.</p>	4
3	PROFESSION AND HUMAN VALUES	<p>Values Crisis in contemporary society, Nature of values: Value Spectrum of a good life</p> <p>Psychological values: Integrated personality; mental health</p> <p>Societal values: The modern search for a good society, justice, democracy, secularism, rule of law, values in Indian</p>	8

		<p>Constitution.</p> <p>Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity.</p> <p>Moral and ethical values: Nature of moral judgments; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.</p>	
TOTAL			24

RECOMMENDED BOOKS:

1. Stephen H Unger, Controlling Technology: Ethics and the Responsible Engineers, John Wiley & Sons, New York.
2. Deborah Johnson, Ethical Issues in Engineering, Prentice Hall, Englewood Cliffs, New Jersey.
3. A N Tripathi, Human values in the Engineering Profession, Monograph published by IIM, Calcutta.
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, “Business Ethics – An Indian perspective”, Biztantra, New Delhi.
5. David Ermann and Michele S Shauf, “Computers, Ethics and Society”, Oxford University Press.

Course Title : ELECTIVE-II (Humanities)

Course Code: HS1317E023

L-T-P-C: 2-0-0-2

Class Hours/week	2
Expected weeks	12
Total hrs. of classes	24

ORGANIZATIONAL BEHAVIOUR

MODULE	TOPIC	COURSE CONTENT	HOURS
1	FOCUS AND PURPOSE	Definition, need and importance of organizational behaviour; Nature and scope; Frame work; Organizational behaviour models.	3
2	INDIVIDUAL BEHAVIOUR	Personality ; types ; Factors influencing personality ; Theories ; Learning ; Types of learners ; The learning process ; Learning theories – Organizational behaviour modification. Misbehaviour; Types; Management Intervention. Emotions; Emotional Labour; Emotional Intelligence, Theories. Attitudes – Characteristics, Components, Formation, Measurement, Values. Perceptions, Importance, Factors influencing perception, Interpersonal perception- Impression Management. Motivation, importance, Types, Effects on work behaviour.	5
3	GROUP BEHAVIOUR	Organization structure , Formation , Groups in organizations , Influence , Group dynamics , Emergence of informal leaders and working norms , Group decision making techniques , Team building , Interpersonal relations, Communication , Control.	5
4	LEADERSHIP AND POWER	Meaning, Importance, Leadership styles, Theories, Leaders Vs Managers, Sources of power, Power centers, Power and Politics.	5
5	DYNAMICS OF ORGANIZATIONAL BEHAVIOUR	Organizational culture and climate, Factors affecting organizational climate, Importance. Job satisfaction, Determinants, Measurements, Influence	6

		on behaviour. Organizational change, Importance, Stability Vs Change, Proactive Vs Reaction change, the change process, Resistance to change, Managing change. Stress, Work Stressors, Prevention and Management of stress, Balancing work and Life. Organizational development – Characteristics, objectives, Organizational effectiveness.	
TOTAL			24

RECOMMENDED BOOKS:

1. Stephen P. Robins, Organisational Behavior, PHI Learning / Pearson Education, 11th edition.
2. Fred Luthans, Organisational Behavior, McGraw Hill, 11th Edition.
3. Hellrigal, Slocum and Woodman, Organisational Behavior, Cengage Learning, 11th Edition
4. Ivancevich, Konopaske & Maheson, Organisational Behaviour & Management, 7th edition, TMcGraw.

Course Title : ELECTIVE-II (Humanities)

Course Code: HS1317E024

L-T-P-C: 2-0-0-2

Class Hours/week	2
Expected weeks	12
Total hrs. of classes	24

INTERNATIONAL BUSINESS AND INTELLECTUAL PROPERTY RIGHTS

MODULE	TOPIC	COURSE CONTENT	HOURS
1	CONCEPT OF INTERNATIONAL BUSINESS	Reason for expansion of international business. Difference from domestic business, international cultural environment, self-reference criterion and ethnocentrism.	4
2	WORLD TRADE	Definition and components of balance of payment, Types and cause of disequilibrium in balance of payment, Foreign exchange rate; fixed and flexible exchange rate and policy of devaluation.	10
3	GLOBALISATION	Meaning, case for globalization, dangers and risks of globalization, consequences of globalization for India.	4
4	INTELLECTUAL PROPERTY	Its origin and development; an overview, Need for protecting intellectual property, copyrights, trademarks and patent: meaning and implication, rights of patentees, International and Indian patent laws	6
TOTAL			24

RECOMMENDED BOOKS:

1. Rakesh Mohan Joshi, 'International Business', Oxford University Press, 6th edition.
2. Avinash Shivade, 'Intellectual Property Manual', Lexis, Nexis.
3. B. L.Wadehra, ' Law Relating to Patent Trade Marks, copy right design and Geographical Indicators', University Law Publishing Co. Ltd.

PRACTICALS

Course Title : FIBER OPTIC INSTRUMENTATION LAB

Course Code: AI131712

L-T-P-C: 0-0-2-1

Expected No. of weeks : 12 (approx)

EXPERIMENT NO.	AIM OF EXPERIMENT	HOURS
1	Fiber end preparation and measurement of numerical aperture.	3
2	Study of Mode field diameter of a single mode fiber.	3
3	Study of Refractive index profile of a multimode fiber.	3
4	Study of Bending in optical fiber- i. Microbending loss in single mode fiber ii. Macro-Bend induced loss in a single mode fiber	3
5	Study of optical fiber as sensor- i. Transmission sensor ii. Reflection sensor iii. Lateral and angular displacement sensor	3
6	Study of 4 channel TDM and demultiplexing.	3
7	Study of the effect of EMI interference on copper medium and optical fiber medium.	3
8	Study of the effect of EMI interference on copper medium and optical fiber medium.	3
9	Study of pulse width modulation (PWM) and pulse position modulation (PPM).	3
10	Study of forming PC to PC communication link using optical fiber link and RS-232 interface.	3
11	Study of PCM coding and frequency response of a CODEC chip.	3
12	Measurement of Bit error rate.	3
TOTAL		36

Course Title : INTRODUCTION TO DIGITAL SYSTEM DESIGN LAB

Course Code: AI131713

L-T-P-C: 0-0-2-1

Expected No. of weeks : 12 (approx)

EXPERIMENT NO.	AIM OF EXPERIMENT	HOURS
1	Write dataflow VHDL description of a half adder. Simulate and verify the design using ISE simulator.	3
2	Write dataflow VHDL description of a Full adder. Simulate and verify the design using ISE simulator.	3
3	Write dataflow VHDL description of a half subtractor. Simulate and verify the design using ISE simulator.	3
4	Write dataflow VHDL description of a Fullsubtractor. Simulate and verify the design using ISE simulator.	3
5	Write dataflow VHDL description of a 4:1 MUX. Simulate and verify the design using ISE simulator.	3
6	Write behavioral VHDL description of a 4:1 MUX.Simulate and verify the design using ISE simulator.	3
7	Write behavioral VHDL description of 1:4 demultiplexer.Simulate and verify the design using ISE simulator.	3
8	Write behavioral VHDL description of 3:8 decoder in VHDL. Simulate and verify the design using ISE simulator.	3
9	Write behavioral VHDL description of D Flip-flop. Simulate and verify the design using ISE simulator.	3
10	Write behavioral VHDL description of J-K Flip-flop. Simulate and verify the design using ISE simulator.	3
11	Write behavioral VHDL description of 4-bit shift register. Simulate and verify the design using ISE simulator.	3
12	Write structural VHDL description of generic ripple carry adder in VHDL. Use GENERATE statement. Simulate and verify the design using ISE simulator.	3
TOTAL		36

AI131717	PROJECT-1	L = 0 T = 0 P = 8 C = 4
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AI131721	SEMINAR ON SUMMER TRAINING	L = 0 T = 0 P = 0 C = 1
GUIDELINES WILL BE DISTRIBUTED BY THE UNIVERSITY FROM TIME TO TIME		
