Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

Syllabus for B. Tech in Electronics & Communication Engineering

(Applicable from the academic session 2018-2019)

Semester-V

EC501	**Electromagnetic Waves**	**3L:0T:0P**	**3 credits**

Module 1

6Hrs

Basics of Vectors, Vector calculus, Maxwell's Equations, Basic laws of Electromagnetic, Poynting Vector, Boundary conditions at Media Interface.

Module II **8Hrs**

Uniform Plane Wave- Uniform plane wave, Propagation of wave, Wavepolarization, Poincare's Sphere, Wave propagation in conducting medium, phase and group velocity, Surface current and power loss in a conductor

Plane Waves at a Media Interface- Plane wave in arbitrary direction, Reflection and refraction at dielectric interface, Total internal reflection, wave polarization at media interface, Reflection from a conducting boundary.

Module III

8Hrs

Transmission Lines- Equations of Voltage and Current on TX line, Propagationconstant and characteristic impedance, and reflection coefficient and VSWR, Impedance Transformation on Loss-less and Low loss Transmission line, Power transfer on TX line, Smith Chart, Admittance Smith Chart, Applications of transmission lines: Impedance Matching, use transmission line sections as circuit elements.

Module IV

6Hrs

Wave propagation in parallel planewaveguide, Analysis of waveguide general approach, Rectangular waveguide, Modal propagation in rectangular waveguide, Surface currents on the waveguide walls, Field visualization, Attenuation in waveguide.

Module V

6Hrs

Radiation: Solution for potential function, Radiation from the Hertz dipole, Power radiated by hertz dipole, Radiation Parameters of antenna, receiving antenna, Monopole and Dipole antenna,

Text/Reference Books:

1. R.K. Shevgaonkar, Electromagnetic Waves, Tata McGraw Hill India, 2005
2. E.C. Jordan & K.G. Balmain, Electromagnetic waves & Radiating Systems, Prentice Hall, India

3. Narayana Rao, N: Engineering Electromagnetics, 3rd ed., Prentice Hall, 1997.
4. David Cheng, Electromagnetics, Prentice Hall

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Understand characteristics and wave propagation on high frequency transmission lines
2. Carryout impedance transformation on TL
3. Use sections of transmission line sections for realizing circuit elements
4. Characterize uniform plane wave
5. Calculate reflection and transmission of waves at media interface
6. Analyze wave propagation on metallic waveguides in modal form
7. Understand principle of radiation and radiation characteristics of an antenna

EC502	Computer Architecture	3L:0T:0P	3 credits

Basic Structure of Computers, Functional units, software, performance issues software, machine instructions and programs, Types of instructions, Instruction sets: Instruction formats, Assembly language, Stacks, Ques, Subroutines.

Processor organization, Information representation, number formats.

Multiplication & division, ALU design, Floating Point arithmetic, IEEE 754 floating point formats
Control Design, Instruction sequencing, Interpretation, Hard wired control - Design methods, and CPU control unit. Microprogrammed Control - Basic concepts, minimizing microinstruction size, multiplier control unit. Microprogrammed computers - CPU control unit

Memory organization, device characteristics, RAM, ROM, Memory management, Concept of Cache & associative memories, Virtual memory.
System organization, Input - Output systems, Interrupt, DMA, Standard I/O interfaces

Concept of parallel processing, Pipelining, Forms of parallel processing, interconnect network

Text/Reference Books:

1. V.Carl Hammacher, “Computer Organisation”, Fifth Edition.
2. A.S.Tanenbum, “Structured Computer Organisation”, PHI, Third edition
3. Y.Chu, "Computer Organization and Microprogramming”, II, Englewood Chiffs, N.J.,
   Prentice Hall Edition
4. M.M.Mano, “Computer System Architecture”, Edition
5. C.W.Gear, “Computer Organization and Programming”, McGraw Hill, N.V. Edition
6. Hayes J.P, “Computer Architecture and Organization”, PHI, Second edition

Course Outcomes

At the end of this course students will demonstrate the ability to

1. learn how computers work
2. know basic principles of computer’s working
3. analyze the performance of computers
4. know how computers are designed and built
5. Understand issues affecting modern processors (caches, pipelines etc.).

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EC503	**Digital Communication and Stochastic**	**3L:1T:0P**	**3.5 credits**

Mod-1 **8L**

Introduction to Stochastic Processes (SPs):

Definition and examples of SPs, classification of random processes according to state space and parameter space,elementary problems. Stationary and ergodic processes, correlation coefficient, covariance, auto correlation function and its properties, random binary wave, power spectral density.

Definition and examples of Markov Chains, transition probability matrix, ChapmanKolmogorov equations; calculation of n-step transition probabilities.

Mod-2 **6L**

Signal Vector Representation:

Analogy between signal and vector, distinguishibility of signal, orthogonality and orthonormality, basis function, orthogonal signal space, message point , signal constellation, geometric interpretation of signals, likelihood functions, Schwartz inequality, Gram-Schmidt orthogonalization procedure, response of the noisy signal at the receiver, maximum likelihood decision rule, decision boundary, optimum correlation receiver; probability of error , error function, complementary error function, Type-I and Type-II errors.

Mod-3 **10L**

Digital Data Transmission:

Concept of sampling, Pulse Amplitude Modulation (PAM), interlacing and multiplexing of samples, Pulse Code Modulation (PCM), quantization, uniform and non-uniform quantization, quantization noise, binary encoding, A-Law and μ -law companding, differential PCM, delta modulation and adaptive delta modulation.

Digital transmission components, source, multiplexer, line coder, regenerative repeater, concept of line coding – polar/unipolar/bipolar NRZ and RZ, Manchester, differential encoding and their PSDs, pulse shaping, Inter Symbol Interference (ISI), Eye pattern, Nyquist criterion for zero ISI, equalizer, zero forcing equalizer, timing extraction

Mod-4 **10L**

Digital Modulation Techniques:

Types of Digital Modulation, coherent and non-coherent Binary Modulation Techniques, basic digital carrier modulation techniques: ASK, FSK and PSK,

Coherent Binary Phase Shift Keying (BPSK), geometrical representation of BPSK signal; error probability of BPSK, generation and detection of BPSK Signal, power spectrum of BPSK. Concept of M-ary Communication, M-ary phase shift keying, the average probability of symbol error for coherent M-aryPSK, power spectra of MPSK,
Quadrature Phase Shift Keying (QPSK), error probability of QPSK signal, generation and detection of QPSKsignals, power spectra of QPSK signals, Offset Quadrature Phase shift Queuing (OQPSK),
Coherent Frequency Shift Keying (FSK), Binary FSK, error probability of BFSK signals, generation and detection of Coherent Binary FSK signals, power spectra of BFSK signal, Minimum Shift Keying (MSK), signal constellation of MSK waveforms, error probability of MSK signal, Gaussian Minimum Shift Keying: GMSK, basic concept of OFDM, constellation diagram,

Some performance issues for different digital modulation techniques - Error Vector Magnitude (EVM), Eye Pattern and Relative Constellation Error (RCE), Conceptual idea for Vector Signal Analyzer (VSA)

Text Books:

1) Digital Communications, S. Haykin, Wiley India.
2) Principles of Communication Systems, H. Taub and D.L.Schilling, TMH Publishing Co.
3) Wireless Communication and Networks : 3G and Beyond, I. SahaMisra, TMH Education.
4) Digital Communications, J.G.Proakis, TMH Publishing Co.
5) S.M. Ross,Stochastic Processes, 2nd Edition, Wiley, 1996 (WSE Edition).

References:

1) Digital Communications Fundamentals andApplications, B. Sklar and P.K.Ray, Pearson.
2) Modern Digital and Analog Communication Systems, B.P.Lathi and Z.Ding, Oxford University Press.
3) Digital Communication, A. Bhattacharya, TMH Publishing Co.
4) J. Medhi,Stochastic Processes, 3rd Edition, New Age International, 2009.

Course Outcome: At the end of this course students will demonstrate the ability to

1. understand the concept of Stochastic Process in Communication System
2. represent various signals in different mathematical forms
3. analyze baseband transmission mode of digital data
4. analyze different career modulation techniques considering noise aspects

EC504	Digital Signal Processing	3L:0T:0P	3 credits

Module I

8Hrs

Discrete time signals: Sequences; representation of signals on orthogonal basis; Sampling and reconstruction of signals; Discrete systems attributes, Z-Transform and ROC, Analysis of LSI systems, frequency Analysis, Inverse Systems, Discrete Fourier Transform (DFT),Fast Fourier Transform Algorithm, Implementation of Discrete Time Systems

Module II

8Hrs

Design of FIR Digital filters: Window method, Park-McClellan's method. Design of IIR Digital Filters: Butterworth, Chebyshev and Elliptic Approximations; Low pass, Band pass, Band stop and High pass filters.

Module III

10Hrs

Effect of finite register length in FIR filter design. Parametric and non-parametric spectral estimation. Introduction to multirate signal processing.
Application of DSP.

Module IV

8Hrs

Origin of Wavelets, Classification(CWT & DWT), Filter Bank

Text/Reference Books:

1. S.K.Mitra, Digital Signal Processing: A computer based approach.TMH
2. A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989.
3. John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms And Applications, Prentice Hall, 1997.
4. L.R. Rabiner and B. Gold, Theory and Application of Digital Signal Processing, Prentice Hall, 1992.
5. J.R. Johnson, Introduction to Digital Signal Processing, Prentice Hall, 1992.
6. D.J.DeFatta, J. G. Lucas andW.S.Hodgkiss, Digital Signal Processing, John Wiley& Sons, 1988.

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Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Represent signals mathematically in continuous and discrete time and frequency domain
2. Get the response of an LSI system to different signals
3. Design of different types of digital filters for various applications

EC591	**Electromagnetic Wave Laboratory**	**0L:0T:2P**	**1 credits**

[At least THREE experiments from Module I and FOUR experiments from Module II]

Module I:

1. Plotting of Standing Wave Pattern along a transmission line when the line is open-circuited, short-circuited and terminated by a resistive load at the load end.
2. Input Impedance of a terminated coaxial line using shift in minima technique.
3. Study of Smith chart on Matlab platform.
4. Simulation study of Smith chart - Single and double stub matching.

Module II:

5. Radiation Pattern of dipole antenna.
6. Radiation Pattern of a folded-dipole antenna.
7. Radiation pattern of a 3-element Yagi-Uda Antenna.
8. Beam width, gain and radiation pattern of a 3-element, 5-element and 7-element. Yagi-Uda antenna - Comparative study.
9. Radiation pattern, Gain, Directivity of a Pyramidal Horn Antenna.

EC592	**Digital Communication Laboratory**	**0L:0T:2P**	**1 credits**

- Design, implementation and study of all the properties of 7-length and 15-length pn sequences using shift register.
- Study of PAM and demodulation.
- Study of PCM and demodulation.
- Study of line coders: polar/unipolar/bipolar NRZ ,RZ and Manchester.
- Study of delta modulator and demodulator.
- Study of adaptive delta modulator and demodulator.
- Study of BPSK modulator and demodulator.
- Study of BFSK modulator and demodulator.
- Study of ASK modulator and demodulator.
- Study of QPSK modulator and demodulator.
- Simulation study of probability of symbol error for BPSK modulation.
- Simulation study of probability of symbol error for BFSK modulation.

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EC593	**Digital Signal Processing Laboratory**	**0L:0T:2P**	**1 credits**

Simulation Laboratory using standard Simulator:

1. Sampled sinusoidal signal, various sequences and different arithmetic operations.
2. Convolution of two sequences using graphical methods and using commands verification of the properties of convolution.
3. Z-transform of various sequences - verification of the properties of Z-transform.
4. Twiddle factors - verification of the properties.
5. DFTs / IDFTs using matrix multiplication and also using commands.
6. Circular convolution of two sequences using graphical methods and using commands, differentiation between linear and circularconvolutions.
7. Verifications of the different algorithms associated with filtering of long data sequences and Overlap -add and Overlap-save methods.
8. Butterworth filter design with different set of parameters.
9. FIR filter design using rectangular, Hamming and Blackman windows.

Hardware Laboratory using DSP Processor and Xilinx FPGA:

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MC-HU501	**Effective Technical Communication**	**0L:0T:3P**	**0 credits**

COURSE OBJECTIVES:

- Build confidence in listening, speaking, reading and writing English professionally.
- Enable the students to think and speak effectively on everyday topics, including topics related to technical concepts
- Equip students with the basics of Academic writing
- Developing industry-ready attitude towards professional communication.
- Prepare for competitive exams like TOEFL, IELTS

The classes need to be taken in ICT enabled classrooms, as well as in the Language lab.

Module-I:

Conversational Skills(6hours)

1. General Conversation
   - **Warm-up sessions**

     Basics of Communication, verbal and non-verbal communication how to be a good speaker, effective body language.

     Practice sessions on:

     - ✓ Introducing oneself
     - ✓ Debates on topics like Is India really developing, Indian culture VS western culture, whether robots will overtake humans one day.
     - ✓ Just a Minute Sessions (JAMS)
     - ✓ Situational Dialogues and Role play : where students can enact everyday situations in their personal and professional lives

Module-II: (6hours)

Intensive Practice Sessions

2.1 **Group Discussion** on topics like dangers of social media, is internet killing the print media, ***Artificial Intelligence, IOT, Cloud Computing, Cyber security***

Module-III:

3.1 Organisational Writing(4 hours)

- Job application letter and CV writing
- E-Mail writing

3.2 Academic Writing(8 hours)

- ***Techniques for good Technical Writing: Academic Writing and Thesis writing***
- Avoiding plagiarism
- Project Proposal
- Statement of Purpose
- Journal Articles

Module-IV: (6 hours)

4.1 Principles and practices of Personal Interview: (Practice sessions)

- Do's and Don'ts of facing an interview.
- SWOC Analysis
- Rigorous practices of mock-interviews

Module-V:

Presentations(4 hours)

- Fundamentals of presentation skills
- Presentation sessions on Technical topics

Module-VI:(6hours)

Preparation for T.O.E.F.L. and IELTS (Guidance and Practice sessions)

References:

1. Technical Communication: Principles and Practice, Meenakshi Raman and Sangeeta Sharma, Oxford University Press, 2015
2. Thesis Writing: A Manual for Researches , F. Abdul Rahim, New Age International Limited, 1996
3. Professional Presentation, Malcolm Goodale, Cambridge University Press, 2005
4. Academic Writing: a Practical Guide for Students, Stephen Bailey London: Routledge Falmer
5. Barron's TOEFL IBT 2016 Guide(with DVD) Pamela J.Sharpe, New Delhi: Galgotia, 2013.

PE-EC505A	**Nano Electronics**	**3L:0T:0P**	**3 credits**

Introduction to nanotechnology, meso structures,Basics of Quantum Mechanics: Schrodinger equation, Density of States. Particle in a box Concepts, Degeneracy. Band Theory of Solids. KronigPenny Model. Brillouin Zones.

Shrink-down approaches: Introduction, CMOS Scaling, The nanoscale MOSFET, Finfets, Vertical MOSFETs, limits to scaling, system integration limits (interconnect issues etc.),

Resonant Tunneling Diode, Coulomb dots, Quantum blockade, Single electron transistors,Carbon nanotube electronics, Bandstructure and transport, devices, applications, 2D semiconductors and electronic devices, Graphene, atomistic simulation

Text/ Reference Books:

1. G.W. Hanson, Fundamentals of Nanoelectronics, Pearson, 2009.
2. W. Ranier, Nanoelectronics and Information Technology (Advanced Electronic Materialand Novel Devices), Wiley-VCH, 2003.
3. K.E. Drexler, Nanosystems, Wiley, 1992.
4. J.H. Davies, The Physics of Low-Dimensional Semiconductors, Cambridge University Press, 1998.
5. C.P. Poole, F. J. Owens, Introduction to Nanotechnology, Wiley, 2003

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand various aspects of nano-technology and the processes involved in making nano components and material.
2. Leverage advantages of the nano-materials and appropriate use in solving practical problems.
3. Understand various aspects of nano-technology and theprocesses involved in making nano components and material.
4. Leverage advantages of the nano-materials and appropriate use in solving practical problems

PE-EC505B	**Speech and Audio Processing**	**3L:0T:0P**	**3 credits**

Introduction- Speech production and modeling - Human Auditory System;General structure of speech coders; Classification of speech coding techniques - parametric, waveform and hybrid ; Requirements of speech codecs -quality, coding delays, robustness.

Speech Signal Processing- Pitch-period estimation, all-pole and all-zero filters,convolution; Power spectral density, periodogram, autoregressive model, autocorrelation estimation.

Linear Prediction of Speech- Basic concepts of linear prediction; LinearPrediction Analysis of nonstationary signals -prediction gain, examples; Levinson-Durbin algorithm; Long term and short-term linear prediction models; Moving average prediction.

Speech Quantization- Scalar quantization-uniform quantizer, optimum quantizer,logarithmic quantizer, adaptive quantizer, differential quantizers; Vector quantization - distortion measures, codebook design, codebook types.

Scalar Quantization of LPC- Spectral distortion measures, Quantization based onreflection coefficient and log area ratio, bit allocation; Line spectral frequency - LPC to LSF conversions, quantization based on LSF.

Linear Prediction Coding- LPC model of speech production; Structures of LPCencoders and decoders; Voicing detection; Limitations of the LPC model.

Code Excited Linear Prediction-CELP speech production model; Analysis-by-synthesis; Generic CELP encoders and decoders; Excitation codebook search - state-save method, zero-input zero-state method; CELP based on adaptive codebook, Adaptive Codebook search; Low Delay CELP and algebraic CELP.

Speech Coding Standards-An overview of ITU-T G.726, G.728 and G.729standards

Text/Reference Books:

1. "Digital Speech" by A.M.Kondoz, Second Edition (Wiley Students" Edition), 2004.
2. "Speech Coding Algorithms: Foundation and Evolution of Standardized Coders", W.C. Chu, WileyInter science, 2003.

PE-EC505C	**Power Electronics**	**3L:0T:0P**	**3 credits**

Characteristics of Semiconductor Power Devices: Thyristor, power MOSFET and IGBT- Treatment should consist of structure, Characteristics, operation, ratings, protections and thermal considerations. Brief introduction to power devices viz. TRIAC, MOS controlled thyristor (MCT), Power Integrated Circuit (PIC) (Smart Power), Triggering/Driver, commutation and snubber circuits for thyristor, power MOSFETs and IGBTs (discrete and IC based).Concept of fast recovery and schottky diodes as freewheeling and feedback diode.

Controlled Rectifiers: Single phase: Study of semi and full bridge converters for R, RL, RLE and level loads. Analysis of load voltage and input current- Derivations of load form factor and ripple factor, Effect of source impedance, Input current Fourier series analysis of input current to derive input supply power factor, displacement factor and harmonic factor.

Choppers: Quadrant operations of Type A, Type B, Type C, Type D and type E choppers, Control techniques for choppers - TRC and CLC, Detailed analysis of Type A chopper. Step up chopper. Multiphase Chopper

Single-phase inverters: Principle of operation of full bridge square wave, quasi-square wave, PWM inverters and comparison of their performance. Driver circuits for above inverters and mathematical analysis of output (Fourier series) voltage and harmonic control at output of inverter (Fourier analysis of output voltage). Filters at the output of inverters, Single phase current source inverter

Switching Power Supplies: Analysis of fly back, forward converters for SMPS, Resonant converters - need, concept of soft switching, switching trajectory and SOAR, Load resonant converter - series loaded half bridge DC-DC converter.

Applications: Power line disturbances, EMI/EMC, power conditioners. Block diagram and configuration of UPS, salient features of UPS, selection of battery and charger ratings, sizing of UPS. Separately excited DC motor drive. P M Stepper motor Drive.

Text /Reference Books:

1. Muhammad H. Rashid, “Power electronics” Prentice Hall of India.
2. Ned Mohan, Robbins, “Power electronics”, edition III, John Wiley and sons.
3. P.C. Sen., “Modern Power Electronics”, edition II, Chand& Co.
4. V.R.Moorthi, “Power Electronics”, Oxford University Press.
5. Cyril W., Lander,” Power Electronics”, edition III, McGraw Hill.
6. G K Dubey, S R Doradla,: Thyristorised Power Controllers”, New Age International Publishers. SCR manual from GE, USA.

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Build and test circuits using power devices such as SCR
2. Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters,
3. Learn how to analyze these inverters and some basic applications.
4. Design SMPS.

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PE-EC505D	**Scientific Computing**	**3L:0T:0P**	**3 credits**

Introduction: Sources of Approximations, Data Error and Computational, Truncation Error and Rounding Error, Absolute Error and Relative Error, Sensitivity and Conditioning, Backward Error Analysis, Stability and Accuracy

Computer Arithmetic: Floating Point Numbers, Normalization, Properties of Floating Point System, Rounding, Machine Precision, Subnormal and Gradual Underflow, Exceptional Values, FloatingPoint Arithmetic, Cancellation

System of liner equations: Linear Systems, Solving Linear Systems,Gaussian elimination, Pivoting, Gauss-Jordan, Norms and Condition Numbers, Symmetric Positive Definite Systems and Indefinite System, Iterative Methods for Linear Systems

Linear least squares: Data Fitting, Linear Least Squares, Normal Equations Method, Orthogonalization Methods, QR factorization, Gram-Schmidt Orthogonalization, Rank Deficiency, and Column Pivoting

Eigenvalues and singular values:Eigenvalues and Eigenvectors, Methods for Computing All Eigenvalues, Jacobi Method, Methods for Computing Selected Eigenvalues, Singular Values Decomposition, Application of SVD

Nonlinear equations: Fixed Point Iteration, Newton's Method, Inverse Interpolation Method Optimization: One-Dimensional Optimization, Multidimensional Unconstrained Optimization, Nonlinear Least Squares

Interpolation:Purpose for Interpolation, Choice of Interpolating, Function, Polynomial Interpolation, Piecewise Polynomial Interpolation

Numerical Integration And Differentiation: Quadrature Rule, Newton-Cotes Rule, Gaussian Quadrature Rule, Finite Difference Approximation,

Initial Value Problems for ODES, Euler's Method, Taylor Series Method, Runga-Kutta Method, Extrapolation Methods, Boundary Value Problems For ODES, Finite Difference Methods, Finite Element Method, Eigenvalue Problems

Partial Differential Equations,Time Dependent Problems, Time Independent Problems, Solution for Sparse Linear Systems, Iterative Methods

Fast Fourier Transform, FFT Algorithm, Limitations, DFT, Fast polynomial Multiplication, Wavelets,Random Numbers And Simulation, Stochastic Simulation, Random Number Generators, Quasi-Random Sequences

Text/ Reference Books:

1. Heath Michael T., "Scientific Computing: An Introductory Survey", McGraw-Hill, 2nd Ed., 2002
2. Press William H., Saul A. Teukolsky, Vetterling William T and Brian P. Flannery, Numerical Recipes: The Art of Scientific Computing", Cambridge University Press, 3rd Ed., 2007
3. Xin-she Yang (Ed.)., "Introduction To Computational Mathematics", World Scientific Publishing Co., 2nd Ed., 2008
4. Kiryanov D. and Kiryanova E., "Computational Science", Infinity Science Press, 1st Ed., 2006
5. Quarteroni, Alfio, Saleri, Fausto, Gervasio and Paola, "Scientific Computing With MATLAB And Octave", Springer, 3rd Ed., 2010

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand the significance of computing methods, their strengths and application areas.
2. Perform the computations on various data using appropriate computation tools.

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OE-EC506A	**Soft Skill and Interpersonal Communication**	**3L:0T:0P**	**3 credits**

UNIT I - SELF ANALYSIS **2 hours**

SWOT Analysis, Who am I, Attributes, Importance of Self Confidence, Self Esteem.

UNIT II - CREATIVITY **3 hours**

Out of box thinking, Lateral Thinking.

UNIT III - ATTITUDE **3 hours**

Factors influencing Attitude, Challenges and lessons from Attitude, Etiquette.

UNIT IV - MOTIVATION **2 hours**

Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators.

UNIT V - GOAL SETTING **4 hours**

Wish List, SMART Goals, Blue print for success, Short Term, Long Term, Life Time Goals.

Time management

Value of time, Diagnosing Time Management, Weekly Planner To do list, Prioritizing work.

UNIT VII - INTERPERSONAL SKILLS **6 hours**

Gratitude

Understanding the relationship between Leadership Networking & Team work. Assessing Interpersonal Skills Situation description of Interpersonal Skill.

Team Work: Necessity of Team Work Personally, Socially and Educationally

UNIT VIII - LEADERSHIP **2 hours**

Skills for a good Leader, Assessment of Leadership Skills

UNIT IX - STRESS MANAGEMENT **4 hours**

Causes of Stress and its impact, how to manage & distress, Circle of control, Stress Busters.

Emotional Intelligence

What is Emotional Intelligence, emotional quotient why Emotional Intelligence matters, Emotion Scales. Managing Emotions.

UNIT X - CONFLICT RESOLUTION **2 hours**

Conflicts in Human Relations – Reasons Case Studies, Approaches to conflict resolution.

UNIT V - DECISION MAKING **4 hours**

Importance and necessity of Decision Making, Process and practical way of Decision Making, Weighing Positives & Negatives

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OE-EC506B	**Cyber Law & Intellectual Property Rights**	**3L:0T:0P**	**3 credits**

Cyber World :

An Overview, The internet and online resources ,Security of information, Digital signature

An Overview Cyber Law:

Introduction about the cyber space , Regulation of cyber space – introducing cyber law Scope of Cyber laws – ecommerce; online contracts; IPRs (copyright, trademarks and software patenting); e-taxation; e-governance and cyber crimes, Cyber law in India with special reference to Information Technology (Amendment) Act, 2008

IPR:

Introduction : Origin and Genesis of IPR , Theories of IPR – Locke's, Hegel andMarxian Ethical, moral andhuman rights perspectives of IPR, Intellectual PropertyRights: International Relevance, Internationalization of IP protection – ParisConvention, Berne Convention, TRIPS Agreement – basic principles and minimum standards – limits of one-size-fit for all flexibilities under TRIPS

Intellectual Property: Issues and Challenges:

Geographical Indications, Layout designs of Integrated Circuits and Protection of Plant Varieties and Farmers' Rights. Copyright protection with reference to performers rights and Artist rights, Global governance towards Patents , Trade Marks: Legal recognition, Comparative analysis in India, EU and USA, Trade secrets : Legal recognition, Comparative analysis in India, EU and USA

Intellectual Property: Contemporary Trends

Benefit sharing and contractual agreements – International Treaty on Plant Genetic Resources for Food and Agriculture – issues on patent policy and farmers' rights- CBD, Nagoya Protocol and Indian law, UNESCO – protection of folklore/cultural expressions Developments in WIPO on traditional knowledge and traditional cultural expressions

Text Book

1. Duggal Pavan, Cyber Law - An exhaustive section wise Commentary on The Information Technology Act along with Rules, Regulations, Policies, Notifications etc. UNIVERSAL LAW PUBLISHING CO. PVT. LTD. C-FF-1A, Dilkhush Industrial Estate, (Near Azad Pur Metro Station) G. T. Karnal Road, Delhi -110033, INDIA2014

Reference Book

1. Intellectual Property Rights in India : General Issues and ImplicationsPrankrishnaPal
2. JonathanRosenoer, "Cyberlaw: the Law of the Internet", Springer-verlag, 1997.

3. W. Cornish & Llewelyn – Intellectual Property: Patent, Copyrights, Trade Marks & Allied Rights",London Sweet & Maxwell.
4. Nard Madison- The Intellectual Property, Aspian Publication.
5. Carlosm Correa- Oxford commentaries on GATT/ WTO Agreements trade Related aspects of Intellectual Property Rights, Oxford University Press.
6. Cornish William – Intellectual Property. Cambridge University Press.

Course Outcome: At the end of the course, the students will be able to :
1. understand the role of intellectual property rights
2. identify the main types of intellectual property rights
3. understand the steps for successful registration and protection of intellectual property rights at national,regional and international levels
4. search patent and trademark databases
5. understand the legal aspects for intellectual property protection

OE-EC506C	**Human Resource Management**	**3L:0T:0P**	**3 credits**

UNIT-1-Human Resource Management :
Meaning & Definition, Functions, Scope & Objectives, Qualities of a HR Manager

UNIT-2-Human Resource Planning :
Meaning & Definition, Importance of HRP,HRP Process. Barriers of HRP, Factors of sound HRP.Recruitment – Meaning & Definition, Sources of Recruitment, Recruitment Process, Effective Recruitment.
Training & Performance Appraisal- Definition & Objective ,Areas of Training, Meaning & Definition of Performance Appraisal, process, Effective principles of performance Appraisal.

UNIT-3- Industrial Relations :
Concept & Meaning, Objective & Importance, Reasons of poor Industrial Relation. Industrial Disputes- Meaning & Definition, Causes of Industrial Dispute, Prevention of Industrial Dispute, Conditions for good Industrial Relation.

UNIT-4- Workers Participation in Management :
Meaning & Need, Forms of Participation, Scheme of participation ,Merits & Demerits. Collective Bargain- Meaning & Definition, Objective & Importance, Process of Collective Bargain, Effective Condition. Employee Discipline-Guidelines for action, Penalties & Punishment, Rewards of Discipline**.**

Text Book
1. Human Resource Management. P. Subba Rao, Himalaya Publishing House, 2012.
2. Human Resource Management. K.Aswathappa. Mc GRAW HILL Education, 2013.
Reference Book
1. Human Resource Development Management . A. M.Seikh S.Chand, 2003.
2. Human Resource Management . S.S.Khanka, S. Chand, 2014.

Course Outcome : At the end of the course the students will be able to :
1. know the professional and personal qualities of a HR manager.
2. learn different methods of selecting human resources through recruitment, training and performanceappraisal system.
3. know how to develop a favourable working environment in an organisation through participation in management and maintain a good industrial relation for benefit of the society.
4. know about consequence of industrial dispute and employee indiscipline of an organization.