Guru Nanak Educational Society's

GURU NANAK INSTITUTE
OF ENGINEERING & TECHNOLOGY
APPROVED BY AICTE, DTE & AFFILIATED TO RTM NAGPUR UNIVERSITY, NAGPUR

Dahegaon, Opp IOC Petrol pump, Kalmeshwar Road, Nagpur- 441501 Ph. 07118-661400
Website: www.gniet.ac.in E-mail: gnietnagpur@gmail.com

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DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES

I SEM

Engineering Mathematics-I (BESI-1T)

CO 1: Able to understand and solve the system of linear equations arising in all engineering fields using matrix methods and knowledge of Eigen values and Eigen vectors.

CO 2: Able to understand and solve algebraic and transcendental equations.

CO 3: Able to understand successive differentiation, sequence and series of the functions.

CO 4: Able to understand the concept of limits and expansion of functions.

CO 5: Able to understand and solve ordinary and partial differential equations.

CO 6: Able to understand the concept of Jacobians, Maxima-Minima and error- approximations.

Engineering Physics (BESI-2T)

CO 1: Ability to apply principles of optics for measurement of various complex Engineering Problems.

CO 2: Ability to develop understanding of phenomenon of acoustics in various Engineering field and apply it for various applications.

CO 3: Students will understand the recent trends and advances in technologies and know how it is implemented in applications.

CO 4: Students will be able to use basic concepts to analyze and design a wide range of semiconductor devices.

CO 5: Ability to analyze and solve quantum mechanical problems and enhance knowledge of atomic systems.

CO 6: Ability to learn method of synthesis of nano-particles and study the physical properties of nano materials and superconductors and also be able to understand their technological applications.

3) Engineering Chemistry (BESI-3T)

CO 1: Understand the technology involved in purification of water for industrial use.

CO 2: Describe basic concepts of electro-analytical methods that facilitate rapid and reliable measurements.

CO 3: Understand important relationships between chemical structure and properties of polymers. Also applications of polymers in various engineering fields.

CO 4: Understand the characteristics of different types of fuel, and look at the factors governing efficient combustion.

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CO 5: The ability to know the development and applications of Nano-materials, Fuel cells, Composite materials in various fields of technologies.

CO 6: Analyze and able to explain the corrosion principles and mechanisms. Critically evaluate corrosion prevention and control strategies.

4) Basic Electrical Engineering (BESI-4T)

CO 1: Understand and solve problems on basic terminologies of electrical engineering.

CO 2: Understand and solve the problems on basic concepts of electromagnetism.

CO 3: Understand the fundamentals of electrostatics and Single Phase transformer.

CO 4: Understand and solve the problems on AC fundamentals.

CO 5: Understand the fundamentals of AC single phase circuits and poly phase circuits.

CO 6: Define various DC circuits laws, theorems and apply them to obtain solutions.

5) Basic Civil Engineering (BESI-5T)

CO 1: Student will understand the basic areas of civil engineering.

CO 2: Student will understand the types of structure and construction materials

CO 3: Student will be able to use modern surveying equipments.

CO 4: Student will to use the natural resources more effectively and reduce the waste generations.

CO 5: Student will be able to follow the principles and bye rules for building planning.

CO 6: Student will be able to acquire the self learning with Presentation in a group on the topic related to environment and energy.

6) Engineering Graphics-I (BESI-6T)

CO 1: Ability to create geometric construction with hand tools.

CO 2: Ability to solve traditional descriptive geometry problems. (Projection of Line and Plane)

CO 3: Ability to visualise and draw primitive solids.

CO 4: Ability to draw curves and lateral surfaces of primitive solids to develop the base for engineering design.

CO 5: Ability to draw 2–D and 3–D views of Solid objects.

CO 6: Ability to develop imagination of physical objects to be represented on paper for engineering communication.

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II SEM

1) Engineering Mathematics-II (BESII-1T)

CO 1: Able to understand the concept of modeling of various physical systems such as
Newton's law of cooling, Electrical circuits, rectilinear motion etc.

CO 2: Able to design and analyse the continuous and discrete system, where knowledge of
Fourier Series and Harmonic analysis is required.

CO 3: Able to use advanced techniques to evaluate integrals.

CO 4: Able to measure the arc length of various curves..

CO 5: Able to use the concept of Sphere, cone and cylinder that arise in vector calculus,
electro-magnetic field theory, cad-cam, computer graphics etc.

CO 6: Able to workout Area, Volume, RMS values and Center of Gravity using techniques of
multiple integrals.

2) Advanced Physics (BESII-2T)

CO 1: The ability to identify, formulate, and solve engineering physics problems and the ability
to apply the design process to engineering problems.

CO 2: The ability to formulate, conduct, analyze and interpret experiments in engineering
physics; with to use modern engineering physics techniques and tools, including software
and laboratory instrumentation.

CO 3 : Apply vector calculus approach to problems in electric field and magnetic field. Apply
laws of physics to simple LRC circuits. Learn physics behind various types of lasers and
their characteristics.

CO 4 : Understand the interference and diffraction from wave optics concepts and know its
applications. Understand polarization of light and its application

CO 5 : To enhance knowledge about photonics and optical fiber communication system and use
modern engineering physics techniques and tools.

CO 6 : Describe development of modern physical optics, with particular attention to the wave
properties of light and optic application.

3) Material Chemistry (BESII-3T)

CO 1 : Describe the methodology and perspectives of Science and the importance of Science
in the development of material chemistry.

CO 2 : Builds a knowledge in chemical bonding and compounds of non-transition elements and
gives an elementary idea about nano materials.

CO 3 : Describes about the general principles of isolation and purification of elements and
instrumental methods of analysis.

CO 4: Explains the chemical and physical properties and dynamics in the thermodynamic limit.
Understand the microscopic properties of the constituent atoms and molecules of a
bulk

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system.

CO 5 : Ethical behavior in issues facing material chemistry including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy and health.

CO 6: Rationalise the physical properties of a range of functional materials including conductors
semi-conductors, insulators, dielectric etc.

4) Engineering Mechanics (BESII-4T)

CO 1: Students will demonstrate knowledge of mathematics and mechanics with logics in resolution and composition of force systems.

CO 2: Students will demonstrate the ability to relate kinematics with kinetic equations on linear
displacement, velocity and acceleration.

CO 3: Students will solve practical examples related to curvilinear motion.

CO 4: Students will correlate power; work and energy to solve practical problems.

CO 5: Students will be able to develop the confidence for self learning in application of equilibrium conditions for co-planar and non co-planar force system.

CO 6: Students will get prepare for analysis of truss, cable, frame and friction

5) Advanced Electrical Engineering (BESII-5T)

CO 1 : Work professionally in one or more of the following areas: analog electronics, digital electronics, communication systems, signal processing, and computer-based systems.

CO 2 : Achieve personal and professional success with awareness and commitment to their ethical and social responsibilities, both as individuals and in team environments.

CO 3 : Maintain and improve their technical competence through lifelong learning, including entering and succeeding in an advanced degree program in a field such as engineering.

CO 4 : Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice to function on multi-disciplinary teams.

CO 5 : Analyse complex electrical and electronics engineering problems and apply appropriate engineering techniques and design processes.

CO 6 : Acquire and evaluate research regarding new knowledge development within the electrical and electronics engineering discipline and its social, cultural, environmental and legal context

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DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION

Mathematics III: BEETE301T   III SEM

CO1: Understand the use of Fourier and Laplace transforms and their simple properties, applications.

CO2: Understand the use of Complex Variable like Analytic function, Cauchy-Riemen condition, conjugate, function, singularities, Taylor's and Laurent theorem.

CO3: To know about the various Calculus of Variations like Maxima and Minima variation and its properties Euler's-equation etc.

CO4: To understand the concept of various Fourier Series

CO5: Understand the use of matrix algebra techniques this is needed by engineers for practical applications.

CO6: Understand the use of matrix algebra Theorem such as Hamilton theorem, Sylvester's theorem, Association of matrices with linear differential equation of second order with a constant coefficient

Electronic Devices And Circuits :BEETE302T

CO1: To present a clear consistent picture of the internal physical behavior of many electronic devices so that their studies of electronic circuits and system will be meaningful.

CO2: To develop the basic tools with which they can later learn about newly developed devices

Electronics Measurement and Instrumentation: BEETE303T

CO1: The primary aim of this subject is to acquaint the students with the basic principles of measuring instruments and show how each of them can be exploited for the measurement of large number of variables

CO2: Gain understanding of various sensors, errors and error analysis, characteristics and response of transducers.

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Object Oriented Programming & Data Structure:BEETE304T

CO1: To understand the concept of object oriented programming and develop skills in C++

Language.

CO2: Access how the choice of data structures and algorithm design methods impacts the

performance of programs.

CO3: To Choose the appropriate data structure and algorithm design method for a specified
application.

CO4: Write programs using C++ Language.

Network analysis & synthesis: BEETE305T

CO1: To make the students capable of analyzing any given electrical network

CO2: To make the students learn how to synthesize an electrical network from a given impedance

admittance function

V SEM

Antenna & Wave Propagation: BEETE501T
CO1: To study transmission line characteristics.

CO2: To study the basics of radiating elements and effect of propagation of radio waves in actual

environment.

CO3: To study the antennas, their principle of operation, analysis and their applications

CO4: To study the features of Antenna array, Microstrip antenna and reflector antenna

CO5: To study designing aspects of Antenna.

Microprocessor And Microcontrollers: BEETE502T

CO1: To study fundamentals of microprocessor and microcontroller systems.

CO2: To study architecture of microprocessor & to understand the concept of memory organization,

stack memory, Assembly language programming

CO3: To study different interrupt techniques.

CO4: To study interfacing of microprocessor & microcontroller with different peripheral devices

ANALOG CIRCUIT AND DESIGN : BEETE503T

CO1: To study the basic characteristic, construction, open loop & close loop operations of Op-Amp.

CO2: To study linear and non linear applications of Op-Amp

CO3: To enable students to design regulated power supply using regulated ICs

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COMMUNICATION ELECTRONICS: BEETE504T

CO1: To study the basic concept of communication and different modulation system based on basic parameters.

CO2: To study the concept of noise, properties & its effects.

CO3: To study the AM, FM, PM process & compute modulation Index..

CO4: 2D Clipping algorithms for regular and irregular windows.

CO5: To develop knowledge about fundamentals of Broadband Communication Systems. .

Industrial Eco & Entrepreneurship Development: BEETE505T

CO1: Study of this subject provides an understanding of the scope of an industrial economics and entrepreneurship development, key areas of business development, sources of finance, project preparation, methods of taxation and tax benefits, significance of entrepreneurship and economic growth, application of engineering skills in entrepreneurial activities etc

VII SEM

DSP PROCESSOR & ARCHITECTURE: BEETE701T

CO1: To study Programmable DSP Processors.

CO2: To provide an understanding of the fundamentals of DSP techniques

CO3: To study implementation & applications of DSP techniques.

CO4: To study multi-rate filters.

CO5: To understand architecture of DSP processor.

Television And Video Engineering: BEETE702T

CO1: To make students understand /explain the analysis and synthesis of T.V. systemTo study various colour TV system with greater emphasis on PAL T.V.system.

CO2: To study various colour TV system with greater emphasis on PAL T.V.system .

CO3: To study Advance Technology of TV Engineering –Digital T.V.,HDTV.

CO4: To study various video recording system,display system and its application.

Optical Communication: BEETE703T

CO1: To understand optical fiber technology to sophisticated modern telecommunication systems.

CO2: To understand the fundamental behavior of the individual optical components, describes their interactions with other devices in an optical fiber.

CO3: To measure & analyze different measurements, parameters & properties of optical fiber.

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Advanced Digital System Design: BEETE704T

CO1: To motivate the students to learn basic foundation course in VHDL.

CO2: To address the challenges in Hardware design by discussing the role of digital components

in system design.

CO3: To concentrate on HDL based digital design ,HDL terminology, architecture and design

of combinational and sequential circuit

CO4: To learn about modeling of system tested with test benches & synthesis also implementation

on FPGA/CPLD

Elective-I:- VLSI SIGNAL PROCESSING: BEETE705T

CO1: To learn pipelining & parallel processing techniques.

CO2: To understand folding & unfolding techniques in multirate system

CO3: To address folding techniques used to design time multiplexed architecture.

Elective-I: Data Compression & Encryption: BEETE705T

CO1: To understand the different text compression technique.

CO2: To study the various audio compression scheme.

CO3: To verify different video compression & image compression methods.

CO4: To have the knowledge of various encryption technique.

CO5: To acquire the information about different authentication technique.

Elective-I: FUZZY LOGIC & NEURAL NETWORK: BEECE705T/ BEETE705T

CO1: Understand the adequate knowledge about feedback neural networks.
CO2: Understand the concept fuzzy logic control to real time systems.

CO3: provide adequate knowledge about fuzzy set theory.

CO4: provide comprehensive knowledge of fuzzy logic control and adaptive fuzzy logic

CO5: study and understand defuzzification techniques.

CO6: Understand and design genetic fuzzy controller.

CO7: gain comprehensive knowledge of adaptive fuzzy system.

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Elective-I: MICROELECTROMECHANICAL SYSTEMS AND SYSTEM ON CHIP BEECE705T/ BEETE705T

CO1: Understand working principles of currently available microsensors, actuators used in Microsystems.

CO2: Apply scaling laws that are used extensively in the conceptual design of micro devices and systems.

CO3: Understand the basic principles and applications of micro-fabrication processes, such as photolithography, ion implantation, diffusion, oxidation, CVD, PVD, and etching.

CO4: Choose a micromachining technique, such as bulk micromachining and surface micromachining for a specific MEMS fabrication process

CO5: Consider recent advancements in the field of MEMS and devices

IV SEM

Applied Mathematics: BEETE401T

CO1: Understand the use of Newton-Raphson method and their convergence. System of linear equation, Gauss elimination method, Gauss seidel method

CO2: Understand the use of Z-Transform, inverse Z-Transform, Relationship of the Fourier transform to Z-transform,Properties of Z-transform, Convolution

CO3: To know about the various Random variable and probability distribution

CO4: To understand the concept of various Definition of mathematical expectation, functions of random variables

CO5: Understand the use of Bernoulli Distribution, Poisson distribution.

CO6: Understand the use of Series solution of differential equation by : Frobanius method,

Bessel's functions,Legendre's polynomials

Power Devices And Machines : BEETE402T

CO1: To teach the basic concepts of power electronics. Also to study the important power devices and machines

CO2: Basics applications of SCR as controlled rectifier.

CO3: To get skill of developing and design related to power electronic circuits.

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ELECTROMAGNETIC FIELDS : BEETE403T

CO1: To provide the students of Engineering with a clear and logical presentation of basic concepts and principles of electromagnetic.

CO2: To identify , formulate and solve fields and electromagnetic waves propagation problems in a multi-disciplinary frame individually or as a member of a group.

Digital Circuits And Fundamental Of Microprocessor: BEETE404

CO1: To acquaint students with various basic digital gates used in digital system and develop logical circuits using Boolean gates, construction of various logic circuits using basic gates

CO2: Able to Design and analyze a given combinational or sequential circuit using Boolean algebra as a tool to simplify and design logic circuits.

SIGNALS AND SYSTEMS : BEETE405T

CO1: The concept of this subject enable you to understand how signals, systems and inference combine in prototypical tasks of communication, control and signal processing.

ENVIRONMENTAL STUDIES : BEETE406T

CO1: Increase understanding of how the world as a bio-physical system works, foster awareness of the earth's vital signs, and sharpen the ability of students to understand the nature and results of science.

CO2: Encourage a critical understanding of the various historical, political, economic, ethical, and religious forces that have shaped and continue to shape our world.

CO3: Nurture an ecological frame of mind which is willing and able to see things whole and thus resist the narrow specialization that can blind us to the connections between disciplines and bodies of knowledge.

CO4: Cultivate people who have sufficient knowledge, care, and practical competence to live in an ecologically responsible way.

CO5: Provide opportunities for students to explore the connections between environmental issues and different religious and philosophical traditions, and to encourage students who are Christian to reflect on their faith and its vision of shalom

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VI SEM

Telecommunication Switching Systems: BEETE601T

CO1: To study the latest development of Telecommunication systems.
CO2: To study the architecture and major design issues related to switching systems.

Digital Signal Processing: BEETE602T

CO1: To study the basic concepts of digital signal processing.
CO2: To study analysis and processing of signals for different kind of applications and retrieval of information from signals.
CO3: To understand the physical significance of circular convolution and its relation with linear convolution.

CO4: To study designing of digital filters and its realization.
CO5: To study analysis of signals using the discrete Fourier transform (DFT) and Z-Transform.
CO6: To study behavior of discrete time systems using Z-Transform.

Control System Engineering : BEETE603T

CO1: To study the fundamental concepts of Control systems and mathematical modelling of the system

CO2: To study the concept of time response and frequency response of the system.
CO3: To study controllers & compensators.
CO4: To study the basics of stability analysis of the system.

Digital Communication: BEETE604T

: To study basic components of digital communication systems.
CO2: To understand the designing aspects of optimum receivers for digital modulation techniques.
CO3: To study the analysis of error performance of digital modulation techniques.
CO4: To study the designing of digital communication systems under given power, spectral and error performance constraint.

Functional English : BEETE604T

CO1: Functional Grammar
CO2: English for Competitive Exams & Interview Techniques
CO3: Formal Correspondence, Analytical comprehension
CO4: Technical & Scientific Writing

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VIII SEM

Computer Communication Network: BEETE801T

CO1: To explain the basic concept of computer communication network.

CO2: To explain the computer network layer.

CO3: To explain IP addressing scheme.

CO4: To explain network process.

CO5: To study Hardware aspect of network communication.

CO6: To make selection of IEEE IAN standards..

CO7: To explain network security & administration

Microwave and Radar Engineering: BEETE802T

CO1: To understand the principles of the advanced microwave engineering

CO2: To design of passive and active microwave components and microwave circuits including:

micro strip line, guided wave device

CO3: To study Klystron amplifier and oscillator.

CO4: To learn working principle of Radar system.

CO5: To understand the radio wave propagation and interference in mobile communications..

CO6: To get knowledge and relate different components in Radar and use them in projects.

Wireless & Mobile Communication: BEETE803T

CO1: To impart the fundamental concept of mobile communication system.

CO2: To give the student the idea about cellular communication theory & technology.

CO3: To introduce various technology and protocol involved in mobile communication.

CO4: To provide the student with an understanding the cellular concept.

Elective II: Embedded Systems: BEETE804T

CO1: To give sufficient background for understanding embedded systems design.

CO2: To give knowledge of RISC processor.

CO3: To understand connections of various peripherals with microcontroller based system

CO4: To study of embedded system design aspects.

Elective-II Digital Image Processing: BEETE804T

CO1: Provide the student with the fundamentals of digital image processing.

CO2: Introduce the students to some advanced topics in digital image processing.

CO3: Give the students a useful skill base that would allow them to carry out further study in the

field of Image processing.

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Elective II - ARTIFICIAL INTELLIGENCE :BEECE804T/ BEETE804T

CO1: understand the history, development and various applications of artificial intelligence;

CO2: .familiarize with propositional and predicate logic and their roles in logic programming;

CO3: understand the programming language Prolog and write programs in declarative programming style.

CO4: learn the knowledge representation and reasoning techniques in rule-based systems, case-based systems, and model-based systems.

CO5: understand how uncertainty is being tackled in the knowledge representation and reasoning process, in particular, techniques based on probability theory and possibility theory (fuzzy logic);

CO6: master the skills and techniques in machine learning, such as decision tree induction, artificial neural networks, and genetic algorithm.

CO7: apply and integrate various artificial intelligence techniques in intelligent system development as well as understand the importance of maintaining intelligent systems.

Elective II- WIRELESS SENSOR NETWORK : BEECE804T/ BEETE804T

CO1: Demonstrate advanced knowledge and understanding of the engineering principle of sensor design, signal processing, established digital communications techniques, embedded hardware and software, sensor network architecture, sensor networking principles and protocols.

CO2: Demonstrate a computing science approach, in terms of software techniques, for wireless sensor networking with emphasis on tiny sensors, sensor specific programming languages, RFID technology, embedded architectures, software program design and associated hardware, data fusion.

CO3: Demonstrate knowledge of the associated business, legislative, safety and commercial issues; future technological advances and the way these will impact on the engineering product enterprise process.

Elective III- CMOS VLSI DESIGN: BEETE805T

CO1: Design PMOS and NMOS transistor.

CO2: Implementation different combinational logic circuits.

CO3: Design layout for various circuits.

CO4: Design CMOS transistor.

CO5: Experiment on CMOS logic design.

CO5: Detect and correct errors in VLSI Design.

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Elective III- SATELLITE COMMUNICATION BEECE805T/ BEETE805T

CO1: Do research with capabilities in the design, development and manufacture of satellite Communication systems used in a wide spectrum of applications.

CO2: Experience real world experience from household appliances to sophisticated satellite communication, from electronic ignition to neural networks and signal processing chips & to integrate academic discipline with project-based engineering applications, classroom learning theory

CO3: Able for Acquisition of technical competence in specialized areas of Satellite Communication engineering.

CO4: Able to identify, formulate and model problems and find Satellite Communication engineering solutions based on a system approach.

Elective III- ROBOTICS & AUTOMATION BEECE805T/ BEETE805T

CO1: Explore 8051 microcontroller architecture

CO2: Effectively utilize instruction set for assembly language programming

CO3: Interface different on & off chip peripherals with 8051 using C language

CO4: Basics of 8051 can be used for robotic applications

Elective III- RANDOM SIGNAL THEORY BEECE805T/ BEETE805T

Year of Study 2017-2018

CO1: Apply theory of probability in identifying and solving relevant problems.

CO2: Define and differentiate random variables and vector through the use of cumulative distribution function (CDF), probability density function (PDF), probability mass function (PMF) as well as joint, marginal and conditional CDF, PDF and PMF.

CO3: Show probability and expectation computations using important discrete and continuous random variable types.

CO4: Define and specify random processes and determine whether a given process is stationary or wide sense stationary.

Department of Electrical Engineering

POST Graduate –Ist Sem

ADVANCED POWER ELECTRONICS: PGPEPS101T

CO 1: Develop in depth knowledge of advanced power electronics devices.
CO 2: Study, design and analyze the ac to ac converters.
CO 3: Understand and analyze various resonant and soft switching techniques for converters. Study, design and analyze the dc to ac converters.
CO 4: Understand the operation of modern power converters and multilevel inverters.
CO 5: Understand the basic principles of power electronics in drives and its control, types of drives and basic requirements placed by mechanical systems on electric drives.
CO 6: Understand the operation of 1ϕ & 3ϕ converter drives for separately excited & series DC motors.
CO 7: Learn speed control of induction motor drives in an energy efficient manner using power electronics.

POWER SYSTEM MODELLING: PGPEPS102T

CO 1: Understand the operational behaviour and problems of two machine and multi-machine power system for stability study
CO 2: To obtain the equivalent circuit, its parameters and simulation model for various components including loads in power system for static and dynamic stability studies.
CO 3: Simulation and analysis of Dynamics of synchronous generator connected to infinite bus or multi machine power system.
CO 4: To develop analytical approach and program tools for testing transition processes in power system.
CO 5: Find equivalent pi model, sending and receiving end power using circle diagram, efficiency & regulation of long transmission line and compare the same with medium and short transmission lines.
CO6: Find effective inductance under open and short circuit condition, draw per phase equivalent circuit of three-phase transformers and compare complex ideal transformers with simple ideal transformer.
CO 7: Analyze three phase armature currents, field current and different reactance's in d-q frame at different operating conditions.
CO 8: Compare the static and dynamic loads and their performance at different frequencies and voltages.

ADVANCED CONTROL THEORY: PGPEPS103T

CO 1: Develop mathematical models of physical systems.
CO 2: Design optimal controllers for physical systems including power electronic and power systems.
CO 3: Analyze the issues related to the stability of automatic control systems.
CO 4: Design complex nonlinear systems by linearizing them.

POWER SYSTEM DYNAMICS & CONTROL: PGPEPS104T

CO 1: To understand short circuit and stability studies of components of power system.
CO 2: To understand controls for improvement in transient stability.
CO 3: To analyze the effects of various faults for multi machine systems.
CO 4: To understand the role of advanced technologies to improve transient stability.
CO 5: To study and analyze the Augmentation of stability.

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APPLICATION OF MICROCONTROLLER IN ELECTRICAL SYSTEM: PGPEPS104T

CO 1: Understand the causes, effects and remedies of power quality problems.
CO 2: To design a system, component or process as per needs and specifications
CO 3: To Write Assembly language program for 8051 Microcontroller to achieve solution to given Task.
CO 4: To learn functioning of Signal conditioning using specific circuits/ transducers and to measure electrical ornon electrical quantities using processor.
CO 5: To apply applications of microcontroller in various engineering fields.

MICRO & SMART GRID: PGPEPS104T

CO 1: Microgrid concepts, Power Electronics interface in AC & DC microgrids, Communication infrastructure, modes of operation and control, Protection and islanding issues, etc
CO 2: Power quality issues in microgrids like modeling and stability analysis, regulatory standards and economics and basic smart grid concepts
CO 3: Load and generation Power flow analysis, economic dispatch and unit commitment problems and various verticals of smart grid
CO 4: Smart grid communication and measurement technologies like Phasor Measurement Unit(PMU),Smart meters, Wide Area Monitoring system(WAMS) etc
CO 5: Penetration of Renewable Energy Sources in smart grid and associated issues and their applications in Electric vehicles etc

ARTIFICIAL INTELLIGENCE: PGOPEN105T

CO 1: Design and implement key components of intelligent agents and expert systems.
CO 2: To apply knowledge representation techniques and problem solving strategies to common AI applications.
CO 3: Apply and integrate various artificial intelligence techniques in intelligent system
CO 4: Development as well as understand the importance of maintaining intelligent systems.
CO 5: Build rule-based and other knowledge-intensive problem solvers.

UTILIZATION OF ELECTRICAL ENERGY: PGOPEN105T

CO 1: To select their electric drive system based on application and availability of power source.
CO 2: Apply power electronics technology in efficient utilization of electrical heating
CO 3: Apply power electronics technology in efficient utilization of electrical welding Create lighting system using illumination fundamentals and various illumination Technologies.
CO 4: Analyze effective utilization of Power Electronic technologies in Electrical Traction.

II   SEM

HVDC & FACTS: PGPEPS201T
CO 1: Describe types of topology and multi terminal HVDC System
CO 2: Describe converter operation in various modes. •Describe converter control modes
CO 3: Describe the application of filters to eliminates harmonics
CO 4: Analyse the fault in HVDC system and provide proper protection.
CO 5: Apply knowledge of FACTS controller to AC transmission system
CO 6: Apply shunt, series and their combination for compensation. Identify, formulate and solve network problems with FACTS controller.
CO 7: Understand the basic requirements in AC transmission and limitations of AC transmission systems.
CO 8: Understand the role of voltage, angle and impedance as important factors in AC power

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flow.
CO 9: Understand the operating characteristic of various FACTS controllers and their role on enhancing maximum power transfer capacity of power transmission systems.
CO [10]: Understand the various methods of controlling voltage, angle and impedance in AC transmission system.
CO [11]: Establish skill to model and analyze FACTS devices in power transmission system operation. Understand the causes, effects and remedies of power quality problems.

POWER QUALITY: PGPEPS202T

CO 1: Identify the various power quality events like short and long duration variations, Waveform distortion, Unbalance, Transients, Power factor etc.
CO 2: Analyze the power quality issues using the Power quality indices.
CO 3: Suggest suitable mitigation strategies for some of the power quality issues.
CO 4: Provide solution for the mitigation of power quality issues like waveform distortion, unbalance, and poor power factor.
CO 5: Analyze various power quality issues as sag, flicker, waveform distortion, unbalance, transients, etc. •Suggest suitable mitigation strategies for some of the power quality issues
CO6: Provide solution for the mitigation of power quality issues like harmonic distortion, unbalance, poor power factor.

ADVANCED ELECTRICAL DRIVES: PGPEPS203T

CO 1: Select the suitable drive for drive system such as phase angle controlled, chopper-controlled dc drive depending upon its rating.

ENERGY AUDIT & MANAGEMENT: PGPEPS204T

CO 1: An ability to develop in depth knowledge for energy balance and understand the various acts for the same
CO 2: To carry out energy audits for optimal use of energy.
CO 3: An ability to understand billing process for various industrial applications and selection of the factors for better utilization of energy.
CO 4: Understand energy conservation in thermal power station.
CO 5: Carry out performance analysis of electrical appliances and related case studies for improvement.

CONVERTERS FOR NON CONVENTIONAL ENERGY SOURCES: PGPEPS204T

CO 1: An ability to develop in depth knowledge for WEC and PV based system.
CO 2: An ability to develop in depth knowledge for analysis of grid connected WEC and PV system.
CO 3: Able to understand the various power electronic converter topologies.
CO 4: Able to use the basics of various converter topologies in the photovoltaic system operation.
CO 5: Able to use the basics of various converter topologies in the wind energy conversion system.

POWER SYSTEM PLANNING: PGPEPS204T
CO 1: Understanding some advanced concepts of power planning.
CO 2: Able to use the basics of load forecasting generation planning that will be useful for engineering professional practice in the power sector operation.
CO 3: Able to use the basics of transmission planning that will be useful for engineering professional practice in the power sector operation

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CO 4: Understanding concepts of power system reliability that will be useful for engineering professional practice in the power sector operation and planning.
CO 5: Able to understand the System Operation & Environmental Aspects in planning that will be useful for engineering professional practice in the power sector.

RESEARCH METHODOLOGY: PGFD205T

CO 1: Knowledge on various kinds of research questions and research designs
CO 2: Formulate research problems (task) and develop a sufficiently coherent research design
CO 3: Assess the appropriateness of different kinds of research designs knowledge on qualitative, quantitative and mixed methods of research, as well as relevant ethical and philosophical considerations
CO 4: Develop independent thinking for critically analyzing research reports

III   **SEM**

PLC & SCADA: PGOPEN301T

CO 1: Students will take part in all sorts of PLC system.
CO 2: Students will be in condition to deal with the problems of PLC programming.
CO 3: They will find out the real time schedule of operation of advanced PLC function.
CO 4: Students will be in condition to deal with various PLC applications.
CO 5: They will handle the problems related with automation and SCADA.
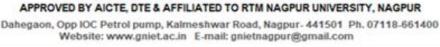
DIGITAL CONTROL SYSTEM: PGFD302T

CO 1: Students will be able to derive and design various stability techniques for improving performance of the system
CO 2: Students will be able to analyze continuous time system using state space technique.
CO 3: Students will be able to derive and describe pole placement by state variable technique and condition for controllability and observability of the system
CO 4: Students will be in condition to deal with various Digital control system applications.

PROJECT PLANNING & MEASUREMENT: PGFD302T

CO 1: Establish measures of success
CO 2: Quantify value commensurate with cost
CO 3: Optimize use of organizational resources
CO 4: Incorporate quality principles

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DEPARTMENT OF ELECTRICAL ENGINEERING

UNDER GRADUATES

III SEM

MATHEMATICS III: BEELE301T

CO [1]: Study of Laplace transform.
CO [2]: Study of Fourier series & Fourier transform.
CO [3]: Study of calculus of variations.
CO [4]: Study of functions of complex variable.
CO [5]: Study of partial differential equations.
CO [6]: Study of matrices.

NON CONVENTIONAL ENERGY SOURCES III: BEELE302T

CO [1]: Learn fundamentals of solar radiation geometry, application of solar energy.
CO [2]: To analyze the motions of mechanisms, design mechanisms to give desired motions, Selection of sites for wind farm, different types of wind generators.
CO [3]: Understand the basic of small hydro, ocean & wave energy.
CO [4]: Understand the basic of other non conventional energy sources.
CO [5]: Understand the basic of BIO Mass and Geothermal Energy.

ELECTRICAL MEASUREMENT AND INSTRUMENTATION III: BEELE303T

CO [1]: Student has understood the details of different electrical instrument used for electrical measurement And Instrumentation.
CO [2]: Students has understood the details of different Bridges used for measurement of R, L and C.
CO [3]: Students have understood the details of different types of potentiometers and CT and PT.
CO [4] The basic idea about transducer and Measurement of acceleration, velocity Measurement of angular velocity, Torque and Power measurement Torque meter.
CO [5]: The basic idea about Measurement of temperature using thermistor, RTD and thermocouple and Two colour pyrometers, Optical pyrometer.

NETWORK ANALYSIS: BEELE304T

CO [1]: Apply node and loop (mesh) analysis.
CO [2]: Apply phasor analysis to AC circuits in sinusoidal steady state.
CO [3]: Use various network theorems for analysis and design of electric circuit.
CO [4]: Analyze periodic inputs to electric circuits using Fourier series and their response.
CO [5]: Compute initial and final conditions for current and m voltage in first and second order circuits.
CO [6]: Determine the response of a circuit excited by a waveform composed of various step and ramp components.
CO [7]: Characterize two – port networks by z, y, t and h parameters.

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ELECTRONIC DEVICES & CIRCUITS: BEELE305T

CO [1]: Principle & working of basic semiconductor devices, Transistors, amplifiers, FET & MOSFETS.
CO [2]: Conversion of numbers from one code to other code.
CO [3]: Logic gates and truth tables of digital circuits.

V SEM

ELECTRICAL POWER SYSTEM-I: BEELE501T

CO [1]: Modeling and representation of the system components used in power system.
CO [2]: Concept of designing transmission line parameters.
CO [3]: The basic concept of load flow analysis.

UTILIZATION OF ELECTRICAL ENERGY: BEELE502T

CO[1]: Understand applications for heating, welding, illumination using electric power.
CO[2]: Understand applications for fan, lowers, compressor, pumps and refrigeration using electric power.

ELECTRICAL MACHINE DESIGN: BEELE503T

CO [1]: Select proper material for design of a machine.
CO [2]: Design a overall transformer and estimates its performance characteristics as per requirement and Constraints specified.
CO [3]: Design rotor core of Induction motor.
CO [4]: Design overall dimensions of synchronous machines.

MICROPROCESSOR & INTERFACING: BEELE504T
CO [1]: VLSI circuit concept.
CO [2]: Introduction to Intel 8085A architecture.
CO [3]: Programming instructions.
CO [4]: Interrupts.
CO [5]: Methods of data transfer.
CO [6]: Hardware and Interface.

ELECTRICAL MACHINE-II: BEELE505T

CO [1]: The student has understood principle, construction, laying of armature and field windings, types, generation emf of synchronous generators.
CO [2]: The student has understood steady state and transient behaviour of synchronous generators.
CO [3]: The student has understood synchronization and parallel operation of synchronous generators.
CO [4]: The student has understood principle, construction, methods of starting of synchronous motor, its operation with variable load, operation with variable excitation, performance evaluation.
CO [5]: The student has understood special motors, like Repulsion, Hysteresis, Reluctance, Universal and Schrage motors.
CO [6]: The Student has understands the MATLAB based Synchronous machine operation.

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VII   **SEM**

CONTROL SYSTEM-II: BEELE701T

CO [1]: Analyze the practical system for the desired specifications through classical and state variable approach.
CO [2]: Design the optimal control with and without constraints.
CO [3]: Analyze non-linear and work with digital system and their further research.

ELECTRICAL POWER SYSTEM-II: BEELE702T

CO [1]: Understand the basics of power system.
CO [2]: Analyze and solve problems on symmetrical & Unsymmetrical fault, stability.
CO [3]: Understand economy of operation and get familiar with types of grounding.

I.T. & ITS APPLICATIONS IN
POWER SYSTEM CONTROL: BEELE703T

CO [1]: Understand the communication used for automation.
CO [2]: Understand the various aspects of energy auditing in industry
CO [3]: Do the networking of communication in industry with instrumentation and microprocessors.

FUZZY LOGIC & NEURAL NETWORK: BEELE703T
CO [1]: Understand the fundamentals of fuzzy logic and ANN.
CO [2]: Learn different neural networks
CO [3]: Learn concepts of Associative memories and self organizing network.

FLEXIBLE AC TRANSMISSION SYSTEMS: BEELE703T
CO [1]: Ability to understand and identify the problems and constraints with stability of large interconnected System.
CO [2]: Ability to understand different types of converters, regulators and compensator.

ENERGY MANAGEMENT & AUDIT: BEELE703T

CO [1]: Know Present energy scenario with need of energy audit and energy conservation.
CO [2]: Understand various aspects of energy audit such as planning, monitoring and implementation.
CO [3]: Manage electric and thermal energy in the industry.

HIGH VOLTAGE ENGINEERING: BEELE704T

CO [1]: Students has understood breakdown mechanism in solid liquid and gaseous medium.
CO [2]: Students has understood lightening and switching over-voltages
CO [3]: Students has understood insulation coordination. And related methodology.
CO [4]: Students have knowledge of different methods of generation of high voltage and currents in laboratory.
CO [5]: Students have knowledge of different methods of measurement of high voltage and currents in laboratory
CO [6]: Students have knowledge different methods of non destructive and High Voltage testing of apparatus.

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ELECTRICAL INSTALLATION DESIGN: BEELE704T

CO [1]: The students will understand concept of load forecasting, solve problems based on regression analysis.
CO [2]: The students will be able to draw single line diagrams with specifications for electrical distribution networks for residential and commercial installations.
CO [3]: The students will be able to draw single line diagrams with specifications for distribution networks, motor and power control centres for industrial installations and design reactive power compensation.
CO [4]: Students shall be able to understand procedure for receipt, storage, testing and commissioning of transformers along with its accessories viz OTI, WTI, Silica Gel Breather, MOG, Buchholz relay etc .
CO [5]: Students shall be able to design 11kV and 33 kV substations for utility and industrial installations and specify the ratings and specifications of apparatus used

EVEN SEM

IV SEM

MATHEMATICS-IV: BEELE401T
CO [1]: Study of mathematical modelling and transfer function.
CO [2]: Study of z-transform.
CO [3]: Study of fuzzy sets and fuzzy logic.
CO [4]: Study of numerical methods-i.
CO [5]: Study of numerical methods-ii.
CO [6]: Study of theory of probability.

ELEMENTS OF ELECTROMAGNETICS: BEELE402T

CO [1]: To study the fundamentals of mechanical engineering such as machine tools and metal is cutting.
CO [2]: Apply various laws in the analysis of electromagnetic systems.
CO [3]:Understand the physical basis for the functioning of circuit elements
CO [4]: Apply Electromagnetic boundary conditions.
CO [5]: Be familiar with the four Maxwell's equations used to study time varying electromagnetic or dynamic fields.
CO [6]: Understand the concept of uniform plane-wave propagation and electromagnetic power density flow in lossless medium.

DIGITAL & LINEAR ELECTRONIC CIRCUIT: BEELE403T
CO [1]: Basic fundamentals of logic gates, Flip flops, timers.
CO [2]: Basic Operational amplifier circuits.
CO [3]: Simple linear circuit.
CO [4]: Applications of Operational amplifier.
CO [5]: Study of Linear ICS.

ELECTRICAL MACHINE-I: BEELE404T

CO[1]: Principle, construction, connections, vector grouping, operation and testing of 3-phase transformer.
CO[2]: Conversion of 3-phasse supply to 2-phase supply, parallel operation of 3-ph. Transformers.
CO[3]: Principle, armature and field construction, types, operation characteristics, armature reaction, commutation, methods to improve commutation in dc generators.
CO[4]: Principle, types, voltage build up, performance characteristics, torque evaluation in dc motors

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CO[5]: Principle, construction, types, torque development, performance characteristics, tests to determine performance indices & parameters of equivalent circuit of 3-phase and double cage induction motors, methods of starting, speed control and braking of induction motors.
CO [6]: Revolving and cross field theories, operation, characteristics, types, equivalent circuit & tests.

COMPUTER PROGRAMMING: BEELE405T

CO[1]: Create awareness about economics terminology and business organization General information of computers and operating systems
CO[2]: Structure of "C" program, Data types, Storage class, variables, expressions and Operators
CO[3]: Use of arrays and sorting techniques
CO[4]: Pointers and structures.
CO[5]: Basics of strings and arrays
CO[6]: C++ concepts
CO[7]: Matrix operation using programming.
CO[8]: Use of graphic tools for presentation

ENVIRONMENTAL STUDIES: BEELE406T

CO [1]: To Understand the Ecosystem.
CO [2]: To Understand the Environmental issues related with social and human population.
CO [3]: To Understand the Biodiversity and its conversion.

VI SEM

POWER STATION PRACTICES: BEELE601T

CO [1]: TO understand the basic parameters of power plant Engineering.
CO [2]: To understand the Thermal power Plant.
CO [3]: To understand Hydro power plant.
CO [4]: To understand Nuclear power plant.
CO [5]: To calculate the tariff for different customers.
CO [6]: To understand co- generation and capacitive power generation.

ENGINEERING ECONOMICS & INDUSTRIAL MANAGEMENT: BEELE602T

CO[1]: After the completion of course the students will be able to manage the thing economically
CO [2]: To understand the different depreciation method.
CO [3]: To understand the management function such as planning, organizing, directing, controlling and communicating.
Co[4]: To understand the budget and their importance.

ELECTRICAL DRIVES & THEIR CONTROL: BEELE603T

CO [1]: To solve numerical on starting, speed control and braking.
CO [2]: To solve numerical on heating and cooling of motors.
CO [3]: It will lay the foundation for studying the advanced subject
Power Semiconductor based drives to be studied in 8th semester
CO [4]: To work on the drives used in the Industry.
CO [5]: Transient stability by using Euler's, Modified Euler's & RK-4th order differential method work with PLC's in the Industry
CO [6]: Will gain an insight in the working of drives used in traction.

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ELECTRICAL WORKSHOP:

CO [1]: To have Knowledge of Basic Circuits Symbol in Electrical Workshop.
CO [2]: To Determine Total Load of any Residential building.
CO [3]: To Determine Total Load of any Commercial building
CO [4]: To Estimate the basics requirement of earthling. .
CO [5]: To Understand Basic Construction and Operation of Various Laboratory Equipments.
CO [6]: To Perform basic maintenance and Troubleshooting of house hold equipment , energy saving etc.

POWER ELECTRONICS: BEELE604T

CO [1]: Understand basic operation of various power semiconductor devices.
CO [2]: Understand the basic principle of switching circuits.
CO [3]: Analyze and design an AC/DC rectifier circuit.
CO [4]: Analyze and design DC/DC converter circuits.
CO [5]: Analyze DC/AC inverter circuit.
CO [6]: Understand the role power electronics play in the improvement of energy usage efficiency and the development of renewable energy technologies.

CONTROL SYSTEM-I: BEELE605T

CO [1]: Model the linear systems and study the control system components specifications through classical and state variable approach.
CO [2]: Understand the time response and time response specifications.
CO [3]: Analyze the absolute stability
CO [4]: Analyse the relative stability through root locus method.
CO [5]: Frequency response tools like bode plot and nyquist plot.
CO [6]: Understand the introductory concepts of state variable approach.

VIII   SEM

ENTREPRENEURSHIP DEVELOPMENT: BEELE801T

CO [1]: Ability to Understand Discrete time signals and system.
CO [2]: Ability to Understand Use of Fourier and z-transform in analysis of discrete signals.
CO [3]: Ability to Understand the Various filter design techniques use for discrete variables and discrete Fourier transform.

POWER QUALITY: BEELE801T

CO[1]: Ability to Understand Power quality standards for voltage sag, swell, distortions, flickers etc
CO[2]: Ability to Understand Approach for power quality monitoring, assessment and mitigation.
CO[3]: Ability to Understand the State variable model and harmonic estimation.

EHV AC & HVDC TRANSMISSION: BEELE801T
CO[1]: Ability to Understand to demonstrate the knowledge of Power handling capacity of different Transmission systems.
CO [2]: Ability to Understand Electrostatic and electromagnetic fields and corona in EHVAC lines.
CO[3]: Ability to Understand the Electrostatic and electromagnetic fields and corona in EHVAC lines.
Co[4]: Ability to Understand the Voltage control and current control systems for power flow controls in HVDC system.

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CO[5]: Ability to Understand the knowledge of design parameters of AC filters as well as DC filters and Reactive power compensation Overall knowledge about the HVDC system such as MTDC, protection and substation layout of HVDC power plant.

ADVANCED MICROPROCESSOR & PERIPHERALS: BEELE802T

CO [1]: Ability to Understand to Microprocessor and microcontrollers with its architecture.
CO [2]: Ability to Understand Interfacing of microprocessor and microcontroller with its peripherals.
CO [3]: Ability to Understand the Concept of virtual memory and DoS structure.

POWER SEMICONDUCTOR BASED DRIVES: BEELE802T
CO [1]: work with confidence on the various drives used in the Industry.
CO[2]: The students can carry research on the newer Switched Reluctance motor and Brushless DC motor.
CO [3]: Understands the traction drives with ac and dc motors.

ELECTRICAL DISTRIBUTION SYSTEM: BEELE802T

CO [1]: Calculate different distribution factors.
CO [2]: Understand classification of load, types of load curves.
CO [3]: Control of voltage and reactive power in distribution system.
CO [4]: Understand distribution automation
CO [5]: Understand distribution substation layout with associated equipments.

SWITCH GEAR & PROTECTION: BEELE803T

CO [1]: Theory & application of main components used in power system protection
CO [2]: Protection systems used for electric machines, transformers, bus bars, transmission lines.
CO [3]: Theory, construction, and applications of main types of circuit breakers.
CO [4]: Design the protection systems needed for each main part of a power system.
CO [5]: To Understand relay Characteristics Different relay.

COMPUTER APPLICATIONS IN POWER SYSTEM: BEELE804T

CO [1]: Determine Bus Impedance & Admittance matrix (required for Load flow & Short circuit Studies) by graphically, Inspection & building algorithm.
CO [2]: Load flow study of a power system by Newton-Raphson & Gauss-Seidal Iterative Method.
CO [3]: Short circuit studies.
CO [4]: Transient stability by using Euler's, Modified Euler's & RK-4th order differential method.

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MTECH (CSE)

SEMESTER:I

High Performance Computer Architecture (PGCSE101T)

CO1: Use various addressing modes and Instructions for solving engineering proble s.

CO2: Use various addressing modes and Instructions for solving engineering problems.

CO3: Analyze the control unit organization and various hazards in pipelining.

CO4: Analyze the memory organization and IPC mechanisms.

CO5: Understand the concepts in file system and security.

Advance in Operating system Design (PGCSE102T)

CO1: Understand the design approaches of advanced operating systems

CO2:Analyze the design issues of distributed operating systems.

CO3: Evaluate design issues of multi processor operating systems.

CO4: Identify the requirements of database operating systems.

CO5:Formulate the solutions to schedule the real time applications.

Data Science (PGCSE103T)

CO1:To will demonstrate proficiency with statistical analysis of data.

CO2: Will develop the ability to build and assess data-based models.

CO3:Will execute statistical analyses with professional statistical software.

CO4:Will demonstrate skill in data management.

CO5:Will apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively

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Elective–I-AI & Expert System Design (PGCSE104T)

CO1: Understand the theoretical base of the expert system and its development process.

CO2: Differentiate between different knowledge representation techniques and describe methods of knowledge acquisition and extraction.

CO3: Describe various learning and planning techniques for different types of expert systems such as neural, fuzzy and real expert system

CO4: Analyze the development process of expert system

CO5: Develop expert systems using various available tools.

Elective –II-Advance data Mining
&Big data Analysis (PGCSE105T)

CO1: Use data pre-processing techniques to build data warehouse

CO2: Analyze transaction databases for association rules.

CO3: Use classification methods and prediction techniques on transaction databases.

CO4: Understand various clustering techniques for categorizing data.

CO5: Understand methods for outlier analysis.

SEMESTER-III

Advance Database System (PGCSE301T)

CO1: Understand Distributed Database Process, Architecture, and Design Principles.

CO2:Apply Distributed Query Optimization Techniques and Algorithms

CO3: Analyze and apply Concurrency Control and Reliability Techniques.

CO4:Characterize Parallel Databases and Distributed Object Databases

CO5: Acquire inquisitive attitude towards research topics in databases

Foundation Course-II-Project Planning
& Management(PGCSE302T)

CO1: Following this course, students will be able to describe a project life cycle, and can skill fully map each stage in the cycle

CO2: Students will identify the resources needed for each stage, including involved stakeholders, tools and supplementary materials

CO3: Students will describe the time needed to successfully complete a project, considering factors such as task dependencies and task lengths

CO4: Students will be able to provide internal stakeholders with information regarding project costs

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by considering factors such as estimated cost, variances and profits

CO5: Students will be able to develop a project scope while considering factors such as customer requirements and internal/external goals

EVEN-SEMESTER

<div align="center">

SEMESTER-II
</div>

Advance in Algorithm (PGCSE201T)

CO1: Analyze algorithms performance using a prior analysis

CO2: Analyze and apply to solve the complex problems using advanced data structures (like arrays, stacks, queues, linked lists, graphs and trees.) asymptotic notation

CO3: Ability to solve the real life problem using different algorithm design techniques

CO4: Understand the NP hard and NP complete concepts.

CO5:Ability to implement using design techniques

Advance Computer Network Security (PGCSE202T)

CO1: Understand fundamental principles of computer networking, and networking devices.

CO2: Analyze the design principles, protocols, addressing and algorithms in the link layer, network layer, transport layer, and application layer

CO3: Analyze principles and advanced networking protocols for different types of network architectures to solve complex engineering problems

Advance digital Image Processing (PGCSE203T)

CO1: Understand the basic concepts and analytical methods of analysis of digital images.

CO2: Understand the fundamental concepts of Digital Image Processing and basic relations among pixels.

CO3: Differentiate Spatial and Frequency domain concepts for image

CO4: Apply restoration process of degraded image and Multi resolution processing.

CO5: Apply Image compression and Segmentation Techniques for image processing applications.

Elective –III-Advance in Multimedia (PGCSE204T)

CO1: Understand various file formats for audio, video and text media.

CO2: Develop various Multimedia Systems applicable in real time.

CO3: To evaluate multimedia application for its optimum performance

CO4: Design interactive multimedia software

CO5: Apply various networking protocols for multimedia applications.

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Foundation Course-I-Research Methodology (PGCSE205T)

CO1: Critically analyse research methodologies identified in existing literature.

CO2: Propose and distinguish appropriate research designs and methodologies to apply to a specific research project.

CO3: Develop a comprehensive research methodology for a research question.

CO4: Apply the understanding of feasibility and practicality of research methodology for a proposed project.

CO5: Apply the understanding of feasibility and practicality of research methodology for a proposed project.
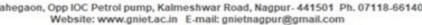
SEMESTER-IV

Project (PGCSE401P)

CO1: To enhance Practical exposure towards solving complex engineering problems in order to achieve Research and Industrial Exposure

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Department of Computer Science and Engineering
B.Tech. (Under-Graduate Courses)
III Sem

Subject: **Applied Mathematics - III**

Course Outcomes:

CO1	To understand numerical methods, matrices for the solution of linear and nonlinear equations, and the solution of differential equations, among other mathematical processes and activities.
CO2	To analyze real world scenarios to recognize when matrices and probability are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches.
CO3	To organize, manage and present data in a clear and concise manner.
CO4	To develop an ability to identify, formulate, and/or solve real world problems.
CO5	To understand the impact of scientific and engineering solutions in a global and societal context.
CO6	To create the groundwork for post-graduate courses, specialized study, and research in computational mathematics.

Subject: Operating System

Course Outcomes:

At the end of this course Student are able to:

CO1	To describe the important computer system resources and the role of operating system in their management policies and algorithms.
CO2	To understand the process management policies and scheduling of processes by CPU.
CO3	To evaluate the requirement for process synchronization and coordination handled by operating system.
CO4	To describe and analyze the memory management and its allocation policies.
CO5	To identify use and evaluate the storage management policies with respect to different storage management technologies.
CO6	To identify the need to create the special purpose operating system.

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Subject:Object Oriented Programming with Java

Course Outcomes:

At the end of this course student are able:

CO1	To identify classes, objects, members of a class and relationships among them for a specific problem
CO2	To understand and demonstrate the concepts of garbage collection, polymorphism, inheritance etc.
CO3	Todonumeric(algebraic) andstring-basedcomputation.
CO4	To understand and implement modularity as well as basic error handling techniques
CO5	Todevelop,designandimplementsmall multithreaded programs using Java language
CO6	Toapply appropriate problem-solving strategies for the implementation of small /medium scale java applications

Subject   : Computer Architecture & Digital System

Course Outcomes:

At theenofthiscourse studentareable:

CO1	To memorize and understand the basic concept of digital system which will be used to design the computer system.
CO2	To study and understand various instruction format used in computer design.
CO3	To study and understand the details working principle of basic processing unit.
CO4	To perform the arithmetic operation which is being used in the operation of computer system.
CO5	To understand wide variety of memory technologies used in computer and design the memory system.

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Subject : **Ethics in IT**

Course Outcomes:

At the end of this course Student are able:

CO1	To acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.
CO2	To articulate what makes a particular course of action ethically defensible
CO3	To identify the multiple ethical interests at stake in a real-world situation or practice
CO4	To understand and apply Intellectual Property and related law in reality.
CO5	To understood the core values that shape the ethical behavior of an engineer / IT Professional.
CO6	To develop cognitive skills in solving social problems.

Subject:**Universal Human Values**

Course Outcomes:

At the end of this course Student are able to:

CO1	To become more aware of themselves, and their surroundings (family, society, nature)
CO2	To become more responsible in life, and in handling problems with sustainable solutions, whilekeepinghumanrelationship andhumannature inmind.
CO3	They would have better critical ability.
CO4	To become sensitive to theircommitment towards what they have understood (human values, humanrelationshipandhumansociety).

Subject:**Environmental Science**

Course Outcomes:

At the end of this course student are able to:

CO1	Identify different types of air pollutions as well as explain their causes, detrimental effects on environment and effective control measures.
CO2	Recognize various sources of water pollutants and interpret their causes and design its effective control measure
CO3	Illustrate various types of pollutants and waste management
CO4	Analyze various social issues related to environment and challenges in implementation of environmental laws.

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4th Semester

Discrete Mathematics and Graph Theory

Course Name : Discrete Mathematics And Graph Theory	
At the end of course Students will be able to –	
CO1	Apply the operations of sets and use Venn diagrams to solve applied problems, Simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic.
CO2	Determine the domain and range of a discrete or non-discrete function, graph functions, identify one-to-one functions, perform the composition of functions, find and/or graph the inverse of a function, and apply the properties of functions to application.
CO3	Define the core idea of group and can apply it for coding theory and cryptography.
CO4	Define the basic concept of Ring and Lattices Evaluate Boolean functions and simplify expression using the properties of Boolean algebra; apply Boolean algebra to circuits and gating networks.
CO5	Determine that a given graph is simple or a multigraph, directed or undirected, cyclic, acyclic, and determine the connectivity of a graph.
CO6	Solve problems using recurrence relations and recursion to analyze algorithms and programs such as finding Fibonacci numbers, the Ackerman function and Tower of Hanoi problems

Course Name : Data Structures & Program Design	
At the end of course Students will be able to –	
CO1	Understand and write the need of various data structure and sorting techniques.
CO2	Understand and implement various types of linked list.
CO3	Implement stack and queue applications
CO4	Understand nonlinear data structure and implement various types of tree operation.
CO5	Design various shortest path algorithm by using graph for real life application.
CO6	Understand and solve problem of hashing techniques.

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Course Name : Theoretical Foundations of Computer Sciences

At the end of course Students will be able to –

CO1	Understand the concept of abstract machines and their power to recognize the languages.
CO2	Understand and design different types of Finite Automata for modeling and solving computing problems.
CO3	Understand, design, analyze and interpret Context Free languages, Expression and Grammars.
CO4	Understand and design different types of Push down Automata as Simple Parser
CO5	Design different types of Turing Machines as Acceptor, Verifier, Translator and Basic computing machine
CO6	Distinguish between decidability and undesirability.

Course Name : System Programming

At the end of course Students will be able to –

CO1	Understand the machine architecture, instruction format of IBM 360/37 and design of assembler.
CO2	Understand various types of macro and design microprocessor.
CO3	Understand and implement various types of loader.
CO4	Understand structure of object file and executable file.
CO5	Understand and analyze comparative study of window and UNIX device driver.
CO6	Understand basic concept of phases of compiler and role of lexical analyzer tool.

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Course Name : Database Management System	
Code : BECSE303T	
At the end of course Students will be able to –	
CO1	Identify the basic concepts and various data model used in database design ER modelling concepts and architecture use and design queries using SQL.
CO2	Apply relational database theory and be able to describe relational algebra expression, tuple and domain relation expression.
CO3	Recognize and identify the use of normalization and functional dependency, indexing and hashing technique used in database design.
CO4	Recognize and identify the purpose of query processing and optimization and also demonstrate the basic of query evaluation
CO5	Apply and relate the concept of transaction, concurrency control and recovery in database
CO6	Understand recovery system and be familiar with introduction to web database, distribute databases, data warehousing and mining.

Subject: Computer Networks

Course Outcomes:

At the end of this course Student are able to:

CO1	Describe the functions of each layer in OSI model along with basic networking concepts.
CO2	Explain physical layer functionality and its working along with transmission media with real time applications.
CO3	Describe the functions of data link layer and explain the protocols used in data link layer.
CO4	Classify the routing protocols and analyze how to map IP addresses. Identify the issues related to transport layer, congestion control
CO5	Describe Quality of Service, DNS, Application layer protocols & Network security issues.

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5th Semester

Course Name: Artificial Intelligence

Course Name : Artificial Intelligence	
Code : BECSE306T	
At the end of course Students will be able to –	
CO1	Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.
CO2	Analyze and formalize the problem as a state space, graph, design heuristics and select among different search or game based techniques to solve them.
CO3	Understand various knowledge representation techniques like first order logic,semanticnet,frames etc.
CO4	Formulate and solve problems with uncertain information using Bayesian approaches.
CO5	Understand various learning probabilistic models.
CO6	Apply concept Natural Language processing to problems leading to understanding of cognitive computing.

Course Name : Software Engineering & Project Management

Course Name : Software Engineering & Project Management	
Code : BECSE309T	
At the end of course Students will be able to –	
CO1	Understand working of different software processing model.
CO2	Understand and write various Software engineering Principles and Practice.
CO3	Understand and design various data flow model.
CO4	Understand and implement various test processes for quality improvement.
CO5	Learn various testing and maintenance measures
CO6	Apply systematic procedure for software design and deployment

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Course Name : Design Patterns	
Code : BECSE307T	
At the end of course Students will be able to –	
CO1	Understand to identify the appropriate design patterns to solve object oriented design problems.
CO2	Understand the concept of creational pattern and develop design solutions using creational patterns
CO3	Understand and apply structural patterns to solve design problems
CO4	Understand and construct design solutions by using behavioral patterns.
CO5	Understand the case study for designing a Document Editor by applying various patterns.
CO6	Understand the complexity in design pattern.

Effective Technical Communication

Course Outcomes: After completing the course, students will
1. Acquire knowledge of structure of language.
2. Be able to face competitive exams and the interview process and can become employable.
3. Develop business writing skills.
4. Become familiar with technology enabled communication and can develop technical and scientific writing skills.

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6th Semester

Subject: Compiler Design	
CO-1	Define compiler design along with phases and basic programs in LEX
CO-2	Develop programs for various kinds of Parsers
CO-3	Write simple programs related to type checking, parameter passing, and over loading
CO-4	Implement the concept of code optimization and code generation
CO-5	Provide the case studies of object oriented compilers
Subject: Internet of Things	
CO-1	Understand vision of IOT in global context
CO-2	Understand M2M to IOT basic perspective
CO-3	Uses of devices, gateways, and data management in IOT
CO-4	Understand the Internet of things privacy, security and governance
CO-5	Implement basic IOT applications on embedded platform

Course Name : Distributed Operating system	
Code : BECSE406T	
At the end of course Students will be able to –	
CO1	Learn the core concepts underlying distributed systems design, issue in the design of Distributed Operating System.
CO2	Understand and analyze different Distributed Mutual Exclusion Algorithm.
CO3	Describe Synchronization, Deadlock and different deadlock detection technique.

CO4	Understand architecture and mechanism of distributed file system and and describe Shared Memory Techniques.
CO5	Understand and write the concept of load distributing and different techniques of load distributing.
CO6	Identify the issues dealing with avoiding and recovering from failures , a concept referred to as fault-tolerance, in distributed systems

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7th Semester

Course Name : Data Warehousing & Mining	
Code : BECSE401T	
At the end of course Students will be able to –	
CO1	Describe the issues in data mining and data warehouse processing and its need.
CO2	Analyze the use of OLAP and its implementation in real life scenarios.
CO3	Build efficient techniques for frequent item set mining.
CO4	Analyze the various classification and prediction techniques and apply it to understand the applications.
CO5	Analyze the clustering methods and its use in data mining
CO6	Mine the time series data and sequence data.

Course Name : Language Processor	
Code : BECSE402T	
At the end of course Students will be able to –	
CO1	Understand and apply basic concept of phases of compiler.
CO2	Design and implement syntax analyzer, compiler parsing techniques and solve various context free grammar and build the parsing table.
CO3	Apply context free grammars, construction of abstract syntax trees, symbol tables and understands the intermediate code.
CO4	Design lexical analyzer using a finite automata along with error recovery
CO5	Apply optimization techniques to intermediate code and generate machine code for high level language program.
CO6	Understand and generate Assembly language code.

Course Name : TCP and IP (Elective - I)

Code : BECSE403T	
At the end of course Students will be able to –	
CO1	Understand reference models with layers, protocols and interfaces Recognize the different internetworking devices and their functions.
CO2	Design, calculate, and apply subnet masks and addresses to fulfill networking requirements of IPV4,get knowledge of ARP,RARP protocol.
CO3	Understand various IP Layer Protocol.
CO4	Understand various basic concept and working of TCP protocol.
CO5	Gain knowledge of various Switching technology, MPLS fundamentals, signaling protocols.
CO6	gGet a knowledge of IP security protocol and implement the concepts addressing to Internet IPv4 and their extension to IPv6.

Course Name : Mobile Computing (Elective – II)

Code : BECSE404T	
At the end of course Students will be able to –	
CO1	Understand and describe basic principles Wireless Communication and 2G communication services
CO2	Understand the Wireless cellular system and describe working of various Media Access Techniques.
CO3	Get a proper understanding of Architecture and working of GSM.
CO4	Understand and write the working of Mobile Transport layer and its various types.
CO5	Understand and describe various Adhoc routing protocol and its security mechanism.
CO6	Get a proper understanding of Wireless Application Protocol and the architecture and working of Bluetooth.

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8th Semester

Course Name : Distributed Operating system	
Code : BECSE406T	
At the end of course Students will be able to –	
CO1	Learn the core concepts underlying distributed systems design, issue in the design of Distributed Operating System.
CO2	Understand and analyze different Distributed Mutual Exclusion Algorithm.
CO3	Describe Synchronization, Deadlock and different deadlock detection technique.
CO4	Understand architecture and mechanism of distributed file system and and describe Shared Memory Techniques.
CO5	Understand and write the concept of load distributing and different techniques of load distributing.
CO6	Identify the issues dealing with avoiding and recovering from failures , a concept referred to as fault-tolerance, in distributed systems

Course Name :Information & Cyber Security	
Code : BECSE407	
At the end of course Students will be able to –	
CO1	Identify information security goals, and implement classical encryption techniques
CO2	Understand ,compare and implement different symmetric encryption techniques.
CO3	Understand, compare and implement of different Asymmetric encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
CO4	Apply different digital signature algorithms to achieve authentication and create secure applications.
CO5	Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.
CO6	Apply the knowledge of cartographic utilities and authentication mechanisms to design secure applications.

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Course Name : Clustering & Cloud Computing (Elective – III)	
Code : BECSE408T	
At the end of course Students will be able to –	
CO1	Gain insight into Cloud computing scenario and its importance
CO2	Describe the variouscloud computing services and its architecture.
CO3	Describe the role of Hadoop and MapReduce in Big Data Analysis.
CO4	Understand cloud security challenges and design some solutions for it.
CO5	Learn application development using C#.NET and design a web application.
CO6	Create cloud application using Azure.

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Department of
Master of Business Administration (MBA)

COURSE OUTCOME

ODD SEMESTER   **I SEM**

PRINCIPAL OF MANAGEMENT (MBCI-1)

CO1: Discuss and communicate the management evolution and how it will affect future managers.

CO2: Observe and evaluate the influence of historical forces on the current practice of management.

Managerial Economics (MBCI-2)

CO1: To Understand the roles of managers in firms.

CO2: To Understand the internal and external decisions to be made by managers.

Accounting For Manager (MBCI-3)

CO1: To understand and apply the essential numerical skills required for bookkeeping and accounting.

CO2: To understand and explain the relationship between the accounting equation and double-entry book keeping.

BUSINESS LAWS (MBCI-4)

CO1: Appreciate the relevance of business law to individuals and businesses and the role of law in an economic, political and social context.

CO2: Identify the fundamental legal principles behind contractual agreements.

**BUSINESS COMMUNICATION
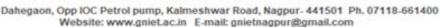& INFORMATION SYSTEM(MBCI -5)**

CO1: Apply business communication strategies and principles to prepare effective communication for domestic and international business situations.

CO2: Identify ethical, legal, cultural, and global issues affecting business communication.

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Research Methodology & Quantitative Techniques(MBCI -6)

CO1: Critically analysis research methodologies identified in existing literature.

CO2: Propose and distinguish appropriate research designs and methodologies to apply to a specific research project.

III SEM

Strategic Management(MBCIII)

CO1: Identify the forces impacting on corporate and business strategies
CO2: Be critically aware of factors involved in strategy making

Environment Management (MBFIII)

CO1: the relationship between environmental management and sustainable development
CO2: the ways in which environmental management is framed and its implications for environmental management at domestic, organizational and community levels

Project Management (MBFIII)

CO1: Manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders.
CO2: Align the project to the organization's strategic plans and business justification throughout its life cycle.

ELECTIVE / SPECIALIZATION COURSES
CORE GROUP – A – MARKETING MANAGEMENT
Sales and Distribution Management (MBEIII-11)

CO1: Recognize and demonstrate the significant responsibilities of sales person as a KEY individual.
CO2: Describe and Formulate strategies to effectively manage company's sales operations

Integrated Marketing Communication& Brand Management (MBEIII – 12)
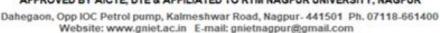
CO1: A sound understanding of such fundamentals helps students appreciate concepts of segmentation, targeting, positioning differentiating, pricing and branding strategies which are necessary to design effective marketing and branding strategies for the organization.
CO2: The course concludes with sessions on integrated communication and digital marketing which are extremely relevant in the growing e-world.

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EVEN SEMESTER

II SEM

Human Resource Management & Organizational Behaviour(MBCII−1)

CO1: Analyze individual and group behaviour, and understand the implications of organizational behaviour on the process of management.

CO2: Identify different motivational theories and evaluate motivational strategies used in a variety of organizational settings.

FINANCIAL MANAGEMENT (MBCII)

CO1: Understand both the theoretical and practical role of financial management in business corporations.

CO2: Evaluate the role and importance of shareholders within modern corporations Have a greater appreciation and understanding of the importance of

Marketing Management(MBCII-3)

CO1: State the role and functions of marketing within a range of organizations.

CO2: Describe key marketing concepts, theories and techniques for analyzing a variety of marketing situations.

Operations Management (MBCII-4)

CO1: identify the roles and responsibilities of operations managers in different organizational contexts

CO2: identify operational and administrative processes

Cost Accounting(MBCII – 5)

CO1: Explain the terminology, basic concepts and principles of cost accounting.

CO2: Prepare cost of goods manufactured statement.

Economic Environment of Business(MBCII – 6)

CO1: Discuss the supply and demand theory and its impact on insurance.

CO2: Explain the effects of government policy on the economic environment and insurance industry

IV SEM

Business Ethics & Corporate Governance(MBCIV)

CO1: Be able to explain and evaluate the part which corporate governance plays in maintaining the stability of markets and retaining public confidence in public intuitions

CO2: Be able to describe and analyze the primary parts of corporate governance frameworks

Guru Nanak Educational Society's

GURU NANAK INSTITUTE
OF ENGINEERING & TECHNOLOGY

APPROVED BY AICTE, DTE & AFFILIATED TO RTM NAGPUR UNIVERSITY, NAGPUR

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Entrepreneurship Development (MBCIV)

CO1: Have the ability to discern distinct entrepreneurial traits.

CO2: Know the parameters to assess opportunities and constraints for new business ideas.

International Business Management(MBFIV)

CO1: Conduct an environmental scan to evaluate the impact of world issues on an organization's international business opportunities.

CO2: Manage the preparation of documents and the application of procedures to support the movement of products and services in the organization's global supply chain.

Investment Environment & Wealth Management (MBEIV)

CO1: The objective is to equip students with the theory and an introduction to the practice of wealth management I n four broad areas, an introduction to the landscape of the industry, basic budgeting and the building blocks of a finance plans, appreciating asset classes and the macro environment and putting together a coherent financial plan/portfolio.

CO2: Students will gain an understanding of the industry and current practices with an Asian and Singapore focus.

Industrial Relations & Labor Laws(MBEIV)

CO1: Describe the basic structural framework of industrial relations in Canada and apply this understanding to compare/contrast the Canadian context with other countries and   assess and debate the evolution of the industrial relations framework over time.

CO2: Governing rules derived from these relationships

Consumer Buying Behavior (MBEIV)

CO1: The course will help the students take a holistic view of the buyer; it will help equip them with knowledge of various models and frameworks to help understand buyer behavior and align the knowledge with formulation of appropriate marketing strategies.

CO2: To understand of the theoretical and conceptual concepts of buyer behavior and apply them to real life marketing situations and practices.