B. Tech Electronics & Communications Engineering

Engineers, from times immemorial, have played a crucial role in contributing to the betterment of humanity and in shaping the world by creating, developing, organizing and managing complex technologies. The growing influence of technology on all functions of society has created a good demand of Engineering graduates. The primary objective is to educate men and women for leadership in the industry and educational institutions, advance the knowledge base of the engineering professionals, and to influence the future direction of engineering practices.

Eligibility Criteria: 10+2(PCM) or equivalent in any stream

To earn a B.Tech in Electronics & Communication Engineering a student has to earn a minimum of 180 credits. Min 100 credits to be earned from science subjects, minimum 40 credits to be earned from Electronics & Communication Engineering subjects and remaining can be taken from any stream

Every student has to attain a minimum of D grade in all courses; a student may however, and repeat or change any course being offered. Notwithstanding, every student must acquire the desired number of credits. The detailed course structure under different categories is given in succeeding pages. Brief description of the course content follows thereafter.

Code	Subject	Credit
4A.101	Mathematics-I	4
4A.102	English Communication I	4
4A.103	Engineering Chemistry	4
4A.104	Engineering Mechanics	4
4A.105	Elements of Electrical Engineering	4
4A.106	Elements of Civil Engineering	4
4A.107	Mathematics-II	4
4A.108	English Communication II	4
4A.109	Engineering Physics	4
4A.110	Programming In C	4
4A.111	Elements of Mechanical Engineering	4
4A.112	Engineering Graphics	4
4A.113	Environmental Studies	4
4A.201	Mathematics-III	4
4A.202	English Communication III	4
4A.203	Basic Electronics	4
4A.204	Digital Logic Design	4
4A.205	Circuit & Network	4
4A.206	Stimulations & Design Techniques	4
4A.207	Electrical Machine	4
4A.208	Mathematics-IV	4
4A.209	English Communication And Life Skill-IV	4
4A.210	Principle Of Business Management	4
4A.211	Advance Electronics	4
4A.212	Microprocessor And Interfacing	4
4A.213	Communication System	4
4A.214	Control System Engineering	4
4A.301	Power Electronics Device & Circuit	4
4A.302	Electromagnetic Theory	4
4A.303	Advance Microprocessor & Microcontroller	4
4A.304	IC Design & Application	4
4A.305	Electrical & Electronics Measurement & Instrumentation	4
4A.306	Signal & Systems	4
4A.307	Digital Signal Processing	4
4A.308	Antenna & Wave Propagation	4

4A.309	Digital Communication	4
4A.310	Data Communication & Networking	4
4A.311	Television Engineering	4
4A.321	Radar & Navigational Engineering	4
4A.322	Biomedical Electronics	4
4A.323	Satellite & Space Communication	4
4A.401	Fiber Optics Communication	4
4A.402	VLSI	4
4A.403	Microwave Engineering	4
4A.404	Mobile Communication	4
4A.421	Embedded System	4
4A.422	Image Processing	4
4A.423	Artificial Intelligence	4
4A.445	Project I	4
4A.446	Project II	4
4A.447	Project III	4

4A.101 Mathematics –I

Credit: 4

Content: Successive differentiation, Expansion of functions, Partial differentiation, Jacobian, Application of partial differentiation Matrix Eigen values And Eigen Vector

4A.102 English Communication I

Credit: 4

This course is designed for the students of Engineering and Technology who need English for specific purposes in specific situations. It aims at imparting the communication skills that are needed in their academic and professional pursuits. This is achieved through an amalgamation of traditional lecture, oriented approach of teaching with the task based skill oriented methodology of learning.

Content: English Grammar Fundamentals, Reading & Comprehension, Framing Sentences and Vocabulary, Positive Outlook and Attitude, Spoken English Skills and Body Language

4A.103 Engineering Chemistry

Credit: 4

This subject helps in developing problem-solving skills related to the nature of matter, chemical reactions, stoichiometry, energy transformations, atomic and molecular structure, quantum theory, chemical bonding, and periodic properties.

Content: Thermodynamics, concept of Entropy, Phase-Rule – Terminology, Water & its treatment, Corrosion and its prevention – Galvanic & concentration cell, Lubrication and Lubricants - Friction, mechanism of lubrication, Introduction to polymeric composites, polymerization, various types of polymerization, Analytical Methods - Thermal methods.

4A.104 Engineering Mechanics

Credit: 4

Content: Basic Concepts Force System and Equilibrium, Definition of Force, Moment and Couple, Principle of Transmissibility, Varignon's theorem, Resultant of force system Condition of static equilibrium for coplanar force system, stability of equilibrium, concept of free body diagrams, Static dry friction, simple contact friction problems, ladders, wedges, screws and belt friction, moment of inertia first moment of inertia, second moment of inertia and product moment of inertia, polar moment of inertia, radius of gyration, mass moment of inertia, Kinematics and Kinetics of Particles, work- Energy equation, Impulse – momentum, Impact – Direct central impact and oblique central impact, Kinematics and Kinetics of Rigid bodies, Plane motion,

4A.105 Elements of Electrical Engineering

Credit: 4

This subject will teach high reliability soldering, desoldering, circuitry repair, plated-thru-hole repairs, conformal coating removal, industry standards, electrostatic discharge (ESD) control, surface mount device (SMD) installation, removal and replacement using hand held systems or reflow workstations. Students will solder highly reliable connections; solder to industry standards; desolder connections; install surface mount

devices; remove surface mount devices; remove conformal coatings; repair and/or replace traces, pads, and eyelets.

Content: D.C. Circuits, Nodal and Loop methods of analysis, A.C. Circuits, Transient response of RL, RC and RLC Circuits with step input, Network Theorems, Star to Delta & Delta to Star transformation, Series and parallel A.C. circuits, Three Phase Circuits, Principle, construction & working of transformer, Introduction to. D.C. Machines, Induction motor, Synchronous machines, Measuring Instruments, Voltmeter, Ammeter, Watt meter, Energy meter.

4A.106 Elements of Civil Engineering
Credit: 4

Content: Buildings-Definition-Classification according to NBC-plinth area, Floor area, carpet area, floor space index, Buildings- Various Components and their functions, Surveying-classification, general principles of surveying – Basic terms and definitions of chain, compass and leveling surveying, Internal and external combustion systems, Solar thermal systems – Solar photovoltaic – Solar pond – wind, wave, tidal, geothermal and ocean thermal energy conversion systems, Elements of arc and gas welding, brazing and soldering.

4A.107 Mathematics II
Credit: 4

Review of the maxima & minima, point of inflexion, Asymptotes, Curve Tracing, Gamma Function & Beta Function Double and triple integral, Differential of Vector, Integration of Vector

4A.108 English Communication II
Credit: 4

English Grammar Fundamentals Ii, Reading & Comprehension II, Vocabulary Building, Confidence Building And Etiquettes, Self Management

4A.109 Engineering Physics
Credit: 4

It is designed to enable students to appreciate the role of physics in today's society and technology. Emphasis on the fundamental laws of nature on which all science is based, with some examples of interest to biologists.

Content: Interference, Division, Diffraction, dispersive and resolving powers. Polarization, Simple concepts of photo elasticity. Spontaneous and stimulated emissions, Laser action, Propagation of light in fibers, Simple concepts of Harmonic Oscillator, resonance; quality factor, E.M. wave theory ,dielectric coefficient permittivity, Special Theory of relativity, Nuclear physics.

4A.110 Programming in C
Credit: 4

Content: This Subject provides an introduction to computer programming and to software development. The first portion of the course introduces students to computer programming, using the C/C++ language, and covers fundamental topics such as flow of

control, function definition, data structures, and object-oriented design and programming. The second portion of the course provides a more holistic view of software development and introduces students to a selection of tools, and additional languages that programmers should be proficient in to become effective software developers, with an emphasis on the Python programming language. Topics in this portion include using build tools, third-party libraries, scripting languages, and data storage.

Content: An Overview of Computer System, Operating System Basics, Introduction to the basic concepts of Networks and Data Communications, Programming Languages, C Programming language, Sittings, Standard library

4A.111 Elements of Mechanical Engineering
Credit: 4

Traditionally, engineering education tries to balance the fundamentals that engineers will need during their career and the skills that they need to start functioning as engineers upon graduation. The dynamic nature of the engineering enterprise makes it impossible and unwise to attempt to teach our students everything they need to know to function during their career. To restate the obvious, their education should include a strong set of fundamentals and the recognition of the need for and the ability to continually learn.

Content: Properties of Steam & Boilers, Steam Turbines and Condensers, Classification, principles, types, compounding of turbine, I.C. Engines and Gas Turbines, Water Turbines, Pumps and Hydraulic Devices, Simple Lifting Machines, Power Transmission Methods and Devices , Stresses and Strains, Bending Moment & Shear Force

4A.112 Engineering Graphics
Credit: 4

Content: This subject is an introduction to engineering design and the related graphical tools used to communicate design concepts. Engineering design require a combination of organization, analysis, and communication skills. Engineering graphics is the primary medium for communicating design concepts and is an important tool for analyzing engineering problems. This subject aims at developing the skills needed for documenting designs using drawings and for performing graphical analysis of two dimensional and three dimensional problems. Manual and computer aided methods of graphical analysis and communication are covered. Topics include the following: visual thinking, engineering design, free-hand sketching, projection theory, pictorial sketching, solid modeling, engineering drawing standards, tolerancing, plotting, and computer-aided design.

4A.113 Environmental Studies
Credit: 4

Introduction to Environment, Ecology and Ecosystem, Ecology & Ecosystems, Environmental Pollution, Population & Natural Resources,

4A.201 Mathematics III
Credit: 4

First order ODE: Methods for solving them, homogeneous equations, exactness, methods for finding integrating factors, Linear and Bernoulli's equation, Linear differential

equations of nth order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solution of second order differential equation by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation), Series Solution and Special Functions, Laplace Transform, Periodic functions, Trigonometric series, Fourier series of period 2π , Euler's formulae, Functions having arbitrary period, Change of interval, Even and odd functions, Half range sine and cosine series

4A.202English Communication III
Credit: 4
Advanced Grammar I, Interview Management I, English Literature Prose, Self Improvement, Business Communication

4A.203Basic Electronics
Credit: 4
Content: Electronics engineering, or electronic engineering, is an engineering discipline where non-linear and active electrical components such as electron tubes, and semiconductor devices, especially transistors, diodes and integrated circuits, are utilized to design electronic circuits, devices and systems, typically also including passive electrical components and based on printed circuit boards. The term denotes a broad engineering field that covers important subfields such as analog electronics, digital electronics, consumer electronics, embedded systems and power electronics. Electronics engineering deals with implementation of applications, principles and algorithms developed within many related fields, for example solid-state physics, radio engineering, telecommunications, control systems, signal processing, systems engineering, computer engineering, instrumentation engineering, electric power control, robotics, and many others.

3.204 Digital Login Design
Credit: 4
Binary Number System, Review of Boolean algebra and Logic gates, Combinational Logic Design, Sequential Logic Design, Registers, Counters and the Memory unit, Logic Families and Semiconductor Memories, Processor Logic Design, Introduction, Processor organization, Arithmetic logic unit, Design of ALU, Status register, design of shifter, Processor subject and Design of accumulator, Control Logic Design

4A.205 Circuit & Network
Credit: 4
The subject describes the topology and general circuit methods. Response of simple networks is explained. Various types of filters are designed.
Content: Topology and general circuit methods, Circuit graph, tree, co-tree, incidence matrix, cut-set matrix, Magnetically coupled circuits, Two-port networks, characteristic impedance, propagation coefficient, Network models, Symmetrical attenuators, Transients in R-L-C circuits, Laplace transforms, Transient analysis, Filters

4A.206 Stimulations & Design Techniques

Credit: 4

This gives an overview of various designing techniques.

Content: Design of different amplifiers (current, voltage, power), design of oscillators, Filters, design of switching regulators including step-up and step-down, design of filters.

4A.207 Electrical Machine

Credit: 4

It gives engineering aspects of electric rotating machines, industrial practices of manufacture and design.

Content: Converter fed operation of DC motor, electronically commuted and permanent magnet motors, applications in electric traction, steel mill drives, etc.modelling of synchronous machines, saliency effects, steady-state and transient, brushless synchronous generators, ac motors, single phase induction motors and applications. Stepper motor and control applications in robotics.

4A.208 Mathematics IV

Credit: 4

Function of Complex variable, Complex Integration, Zeroes of transcendental and polynomial equation using Bisection method, Rate of Interpolation: Finite differences, difference tables, Newton's forward interpolation & it's problems, Newton's backward interpolation & it's problems, Newton's divided difference formula for unequal intervals & it's problems ,Lagrange's divided difference formula for unequal intervals & it's problems, Numerical integration: Trapezoidal method & it's problems method, Simpson's one third and three-eight rules & problem based on Simpson's one third and three-eight rules . Numerical Differntiation: Solution of ordinary differential equations by following methods: Euler's Method, Picard's Method and forth-order Runge- Kutta methods & it's problems

4A.209 English Communication IV

Credit: 4

Interview Management II, Presentation Skills, Writing Skills And Spoken English, Personal Development, English Literature Prose – Novel

4A.210 Principles of Business Management

This subject introduces basic management concepts, theories, and their application, and offers an overview of managerial concerns arising in modern organizations.

Content: Management: Definitions, Significance of management, Management and administration, Principles of Management, Evolution of management/various schools of thought, Pre-Scientific Management Era, Classical Management Era, Neo-Classical Management Era, Modern Management Era, Recent developments in management, Fundamentals of Planning, Steps of Planning, Forecasting and planning, Elements of Planning, Decision Making, functions of management, forecasting- definition, types, scheduling, organizing, staffing, Directing, Controlling, Leadership.

4A.211 Advance Electronics

Credit: 4

Transistors At High Frequencies, The Transistor At Low Frequencies, IC And Operational Amplifiers, Stability And Oscillators, Transducer

4A.212 Microprocessor & Interfacing

Credit: 4

Block diagram of digital computer, Classification of computer languages, High level and low level languages, introduction to microprocessor, microprocessor systems with bus organization, microprocessor architecture & operations, memory, i/o device, memory and i/o operations, programming, parallel input/output and interfacing, interrupts, programmable peripheral interface

4A.213 Communication System

Credit: 4

Introduction to Communication system, Basic block diagram, Passive Circuits, Amplitude Modulation, Angle Modulation , Radio Receivers

4A.214 Control System Engineering

Credit: 4

Introduction to Control Systems, Examples of Control Systems, Closed-loop Control versus Open-Loop Control, Mathematical Modeling of Dynamic Systems, Mathematical Modeling of Fluid Systems and Thermal systems, Transient and Steady-State Response Analyses, Root-Locus Analysis, Frequency-Response Analysis, Design and Compensation

4A.301 Power Electronics Device & Circuit

Credit: 4

This subject is to have in depth understanding of working and performance of various power electronic devices and focus on applications of power electronics as a whole.

Content: Introduction to power electronics, Controlled Rectifiers, Dual converters. Regulated D.C. power supplies, Inverters, MC-Murray-Bedford half bridge inverters, Choppers, Multi quadrant choppers, Applications, Converter and chopper control of dc motors

4A.302 Electromagnetic Theory

Credit: 4

Content: Max wells equations, displacement current, equation of continuity, boundary condition. Propagation of uniform plain waves in perfect dielectric and in glossy medium, reflection, refraction, phase and group velocities, transmission line: evaluation of line parameters, design concepts, cutoff frequency, attenuation, dispersion, power handling capacity, traveling waves, standing waves, Smith chart and matching techniques, pulse propagation, radiation concept : elementary dipole, half wave dipole, radiation patterns, gain, pattern multiplication. basic antennas.

3.303 Advance Microprocessor & Microcontroller
Credit: 4

The objective of this course is to give the students the ability to design, build and test a microprocessor-based controller system. Students will learn how a microprocessor works, and programming in assembly language.

Content: Microprocessor-Based Systems, Types of Microprocessor, Applications of Microprocessors, Software Design for a Microprocessor-Based System, Software Coding and Testing for a Microprocessor Based System, Programmable Parallel Interface, Programmable Serial Interface, Non-Programmable Parallel Interface.

4A.304 IC Design & Application
Credit: 4

Operational Amplifier Fundamentals, Op-Amps as AC Amplifiers, Op-Amps frequency response and compensation, Op-Amp Application, Other Linear IC applications

4A.305 Electrical & Electronics Measurement & Instrumentation
Credit: 4

This subject is to develop students' understanding of the concepts of measurement and test. In particular the subject is designed to develop the underpinning knowledge and skills required to perform complex measurement and test procedures.

Content: Concepts in measurement of electrical quantities data, error, accuracy, precision measuring the basic electrical quantities and the factors affecting their measurements basic principles of measurement of strain, vibration, pressure and flow in various electro-mechanical systems,

4A.306 Signal & Systems
Credit: 4

The aim of this subject is to develop analytical framework for signals and systems by introducing their mathematical description and to analyze and solve problems that arise in a broad array of applications in control and communication engineering.

Content: Frequency spectrum, energy and power signals, Sampling of continuous-time signals and sampling rate, basic system properties that are used to model many physical processes as Linear Time-Invariant (LTI) system, Time domain and frequency domain techniques, continuous and discrete-time signals, Fourier series method of representing continuous-time periodic signals, Fourier Transform and its properties, Z-transform, Discrete Fourier Transform (DFT) and Discrete Time Fourier Transform-DTFT, Fast Fourier Transform (FFT) algorithm.

3A.307 Digital Signal Processing
Credit: 4

The main objective of this subject is to understand DSP based embedded system design methodology and applications in the fields of biotechnology, telecommunications, computer science and electronic engineering.

Content: System architecture, analog to digital conversion, Analog filtering and its limitation, Sampling theorem and quantisation, Performance metrics for A/D and D/,

Fourier Transforms-FT, DFT and FFT and Z-transform, Digital filters like Windowed Sync, Moving average-FIR filter and Recursive–IIR filters, MATLAB with SIMULINK, programmable features using DSP chips as live projects for audio, development tools available for design and DSP implementation.

3A.308 Antenna & wave Propagation
Credit: 4

This subject is designed to describe the theory of radiation of antenna and propagation characteristics and their applications in communication engineering. Maxwell's Equations for simple media to study the radiation phenomenon will be studied.

Content: Electro-magnetic energy radiation, Propagation of radio waves mechanism, fundamentals of antenna parameters and radiation properties, Antenna theory, Smart, methods of antenna parameters measurement (input impedance, pattern, gain, directivity, radiation efficiency, current and polarization), Live Projects using Computer Aided Design tools, Horn, reflector, aperture, micro-strip and parabolic antennas.

4A.309 Digital Communication
Credit: 4

This subject will introduce the principles of electronic analogue and digital communication systems. It will illustrate the applications of these principles to real communication systems like Radio, TV systems for audio, video and data transmission.

Content: Boolean algebra, k-maps, Introduction to communication signals and noise, Communication signals, Frequency Bands and Radio Regulations, Analogue modulation fundamentals, Transmission lines, Analogue receivers, super hetrodyne receivers, SSB demodulation. Multiplexing of signals-TDM, FDM and WDM, Digital Modulation Fundamentals, System design, TV system design.

4A.3010 Data Communication & Networking
Credit: 4

The objectives of this subject are to establish the basic fundamental understanding of digital communication and computer networks. The transmission techniques, transmission media and transmission impairments, modulation and demodulation, coding and decoding will be discussed.

Content: Character and Packet transmission, OSI reference model, communication channels-hardwired and soft-wired, LAN, MAN, and WAN design, protocol TCP/IP architecture, IEEE 802 standards, design of various types of networks like Ethernet, Token Bus, FDDI ring, DES-Data Encryption Standard Algorithm. Digital signature concept, simple network management software-SNMP, advanced networking concept and applications of ISDN, ATM, and GSM.

4A.311 Television Engineering
Credit: 4

This subject introduces Elements of a Television system. Picture transmission, sound transmission picture reception sound reception synchronization, receiver controls, color television.

Content: Analysis and Synthesis of Television Picture's: Gross structure, image continuity, and no. of scanning lines, flicker, fine structure, tonal gradation. Signal Transmission and Channel Bandwidth. Television Signal and Applications: Television Trans-mission antennas, television receiver antennas color television antennas. Television Applications: Cable television, CCTV, picture phone and facsimile, television Via satellite, Remote Control, Digital tv88.

4A.321 Radar & Navigational Engineering
Credit: 4

This subject is to make the students understand radar system communication. It begins with a detailed introduction of radar system.

Content: Block diagram representation, frequencies used, applications, noise, losses etc. MTI and pulse radar systems, tracking techniques, Limitations of tracking accuracy, Radar equations, Propagation of radio waves over earth's surface, MTI and Pulse Radar, Radar Transmitters and Receivers, Linear power tubes, solid-state RF power sources, magnetrons CFA radar receiver and noise figure, and duplexers.

4A.322 Biomedical Electronics
Credit: 4

It introduces to Basic principles of biomedical instrumentation and techniques. Problems of interfacing biomedical, electrical and electronic equipment with living system,

Content: Measuring instruments for biosignals e.g. ECG,EMG,EEG and evoked responses. Biomedical transducers for pressure, flow and temperature. Biomagnetic measurement and imaging. Cardiac output measurement techniques. Diagnostic and therapeutic instruments. Prosthetic devices like pacemaker, hearing-aid and myoelectric arm. Functional electrical stimulation and algorithms for extremity control. Biotelemetry of biological signals, biosensors. Neonatal monitoring. Special aspects such as safety of medical electronic equipment.

4A.323 Satellite & Space Communication
Credit: 4

Content: Evolution and growth of communication satellites, Kepler's Law of Motion, orbits, altitude control; Spectrum allocation and Bandwidth considerations; Propagation Characteristics, satellite transponders and other systems; Earth station technology; Analog and Digital link design; Multiple access techniques, FDMA, TDMA, SSTDMA; Frequency reuse, satellite switched TDMA; Time slot assignment; Inter satellite links

4A.401 Fiber Optics Communication
Credit: 4

This subject introduces the learner, the fundamentals of the fibre communication system as explained with the help of a typical fibre system diagram. Electromagnetic spectrum is discussed along with the region in which the fibre communication is carried on.

Content: Optical source for fiber communication, various types of fibers, Signal degradation in optical fibers due to scattering, types of absorption losses and radiative

losses, dispersal in optical fibers, design of a fiber link, designing the link, link power budget, point-to-point digital transmission system is, coding schemes and noise effects.

4A.402 VLSI
Credit: 4

This subject aims to introduce the VLSI design methodology for ASIC design. The study of VLSI design and fabrication processes by simple concepts such as stick and symbolic diagrams is carried out rather than going into complex design rules.

Content: Bi-CMOS, NMOS and CMOS, Basic characteristics of MOS transistor, CMOS, scaling down of feature size, ASIC design options, VLSI design flow, Hardware description languages, Commercial issues surrounding VLSI circuit, Analogue and digital mixed-type VLSI system, SOC-system, digital IP cores in SOC, VLSI design processes using CAD tools and FPGA devices.

4A.403 Microwave Engineering
Credit: 4

This subject is to introduce the students the microwave devices and familiarize with their applications. Various microwave, microwave tubes and oscillators and their design principles are described.

Content: Scattering matrix representation of microwave network, Microwave Tubes, klystrons, multicavity klystron amplifiers, Solid State Microwave Devices, IMPATT, BARRIT diodes, TRAPATT diodes, Microwave Filters, Microwave Transmission Lines and Resonators, resonators, wave-guide cavity resonators, Applications of Microwave.

4A.404 Mobile Communication
Credit: 4

This gives an overview of mobile computing, wireless and mobile computation.

Content: SS7 and GSM, mobile IP, wireless mobile ATM, multicast routing protocols, location management, mobile agents, mobility management.

4A.421 Embedded System
Credit: 4

This subject explain the hardware required for embedded systems, interrupts, software architecture, design of real time operating systems and debugging techniques.

Content: Hardware Fundamentals-Basic hardware terms, Gates, Timing Diagrams, Memory, microprocessors, buses, Direct memory access, Interrupts, Interrupts Microprocessor architecture, Interrupt basics, the shared-data problem, Interrupt latency, Software Architecture: Round-Robin, Round-Robin with interrupts, Function-Queue-scheduling architecture, Selecting an architecture, Semaphores and shared data, Message queues, Mailboxes, Pipes, Timer Functions, Events, Memory management, Interrupt routines in an RTOS environment, Host and target machines, Linker/Locators for Embedded system, Getting embedded software into the target system, Testing on the host machine, Instruction set simulators.

4A.422 Image Processing

This subject introduces to characterization of images as to dimensional discrete fields.

Content: Unitary transforms DFT, HADA MARD, SLANT and COSINE transforms, compression schemes karhunen loeve compression predictive coding course image enhancement gray scale modification, edge enhancement, recursive filtering.

4A.422 Artificial Intelligence

Credit: 4

This subject will introduce various opportunities to apply a wide range of artificial intelligence and expert system techniques in acquisition, archiving, analysis, and interpretation of biological information.

Content: This subject will describe in detail ways applying artificial intelligence and expert system techniques to bioinformatics, mainly in protein structure, molecular dynamics, and genome analysis, and general data mining of biological databases. This will also help in understanding the structure, function of proteins, cells, the genome, and understanding the process of natural evolution.

4A.445 Project I

4A.446 Project II

4A.447 Project III