Sylhet Engineering College

COURSE REQUIREMENTS FOR UNDERGRADUATE COMPUTER SCIENCE AND ENGINEERING STUDENTS

Undergraduate students of the Department of Computer science and Engineering have to follow a particular course schedule which is given in this chapter according to semester-wise distribution of the courses:

SEMESTER-I

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 101	Introduction to Computer Systems	1.00	---	1.00	
CSE 102	Introduction to Computer Systems (Sessional)	------	3.00	1.50	
EEE 105	Introduction to Electrical Engineering	2.00	---	2.00	
EEE 106	Introduction to Electrical Engineering (Sessional)	---	3.00	1.50	
ME 100	Mechanical Engineering Drawing-I	---	3.00	1.50	
ME 101	Mechanical Engineering	2.00	---	2.00	
ME 102	Mechanical Engineering (Sessional)	--	3.00	1.50	
MATH 101	Differential Calculus and Co-ordinate Geometry	3.00	---	3.00	
PHY 101	Physics (Heat and Thermodynamics, Structure of Matter, Waves and Oscillations, and Physical Optics)	3.00	---	3.00	
PHY 102	Physics (Sessional)	---	3.00	1.50	
SS 101	Social Studies	2.00	---	2.00	
	Total	**13.00**	**15.00**	**20.50**	

SEMESTER-II

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 201	Structured Programming Language	3.00	---	3.00	
CSE 202	Structured Programming Language (Sessional)	---	3.00	1.50	
CSE 203	Discrete Mathematics	3.00	---	3.00	
MATH 201	Integral Calculus, Differential Equations and Series	3.00	----	3.00	
CHEM 201	Chemistry	3.00	---	3.00	
CHEM 202	Chemistry (Sessional)	---	3.00	1.50	
ENG 201	English Language	2.00	---	2.00	
ENG 202	Communication in English (Practice)	---	2.00	1.00	
SS 201	Government and Public Administration	2.00	---	2.00	
	Total	**16.00**	**8.00**	**20.00**	

SEMESTER-III

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 301	Object Oriented Programming Language	3.00	---	3.00	
CSE 302	Object Oriented Programming Language (Sessional)	---	3.00	1.50	
CSE 303	Data Structures	3.00	---	3.00	
CSE 304	Data Structures (Sessional)	---	3.00	1.50	
CSE 305	Digital Logic Design	3.00	---	3.00	
CSE 306	Digital Logic Design (Sessional)	---	3.00	1.50	
EEE 309	Electronic Devices and Circuits	3.00	---	3.00	
EEE 310	Electronic Devices and Circuits (Sessional)	---	3.00	1.50	
MATH 301	Complex Variable and Statistics	3.00	---	3.00	
	Total	**15.00**	**12.00**	**21.00**	

SEMESTER-IV

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 401	Algorithms	3.00	---	3.00	
CSE 402	Algorithms (Sessional)	---	3.00	1.50	
CSE 403	Digital Electronics and Pulse Techniques	3.00	---	3.00	
CSE 404	Digital Electronics and pulse Techniques (Sessional)	---	3.00	1.50	
CSE 405	Theory of Computation	2.00	---	2.00	
EEE 407	Electrical Drives and Instrumentation	3.00	---	3.00	
EEE 408	Electrical Drives and Instrumentation (Sessional)	---	3.00	1.50	
MATH 401	Matrices, Vectors, Fourier Analysis, Laplace's Transforms	3.00	---	3.00	
SS 401	Managerial Economics	2.00	--	2.00	
	Total	**16.00**	**9.00**	**20.50**	

SEMESTER-V

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 501	Database Management System	3.00	---	3.00	
CSE 502	Database Management System (Sessional)	---	3.00	1.50	
CSE 503	Computer Architecture	3.00	---	3.00	
CSE 505	Microprocessors and Microcontrollers	3.00	---	3.00	
CSE 506	Microprocessors and Microcontrollers (Sessional)	---	3.00	1.50	
CSE 507	Operating System	3.00	---	3.00	
CSE 508	Operating System (Sessional)	---	3.00	1.50	
CSE 509	Communication-I	3.00	---	3.00	
SS 501	Project Planning and Management	2.00	---	2.00	
	Total	**17.00**	**9.00**	**21.50**	

SEMESTER-VI

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 601	Mathematical Analysis for Computer Science	3.00	---	3.00	
CSE 603	Compiler	3.00	---	3.00	
CSE 604	Compiler (Sessional)	---	3.00	1.50	
CSE 605	Software Engineering and Information System Design	3.00	---	3.00	
CSE 607	Numerical Methods	3.00	---	3.00	
CSE 608	Numerical Methods (Sessional)	---	3.00	1.50	
CSE 609	Computer Networks	3.00	---	3.00	
CSE 610	Computer Networks (Sessional)	---	3.00	1.50	
CSE 612	Software Development	---	3.00	1.50	
	Total	**15.00**	**12.00**	**21.00**	

SEMESTER-VII

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 700	Project and Thesis	---	6.00	3.00	
CSE 701	Artificial Intelligence	3.00	---	3.00	
CSE 702	Artificial Intelligence (Sessional)	---	3.00	1.50	
CSE 703	Peripheral and Interfacing	3.00	---	3.00	
CSE 704	Peripheral and Interfacing (Sessional)	---	3.00	1.50	
IPE 701	Industrial Management	2.00	---	2.00	
SS 703	Sociology and Industrial Law	2.00	---	2.00	
SS 705	Financial Management & Accounting	3.00	---	3.00	
CSE 705	Simulation and Modeling	3.00	---	3.00	
	Or				
CSE 707	Basic Graph Theory	3.00	---	3.00	
	Or				
CSE 709	Fault Tolerant Systems	3.00	---	3.00	
	Or				
CSE 711	Digital Image Processing	3.00	---	3.00	
	Or				
CSE 713	Basic Multimedia Theory	3.00	---	3.00	
	Total	**16.00**	**12.00**	**22.00**	

SEMESTER-VIII

Course Number	Course Title	Hours/Week		Credit	Pre-requisite
		Theory	Practical/ Sessional		
CSE 800	Project and Thesis	---	6.00	3.00	
CSE 801	Computer Graphics	3.00	---	3.00	
CSE 802	Computer Graphics (Sessional)	---	3.00	1.50	
CSE 803	Introduction to Distributed Computing	3.00	---	3.00	
Network and Communications group One subject from the following groups (depending on availability of Resources) :					
CSE 807	Communication-II	3.00		3.00	
CSE 808	Communication-II (Seasonal)		3.00	1.50	
Or					
CSE 809	Wireless & Mobile Communication	3.00		3.00	
CSE 810	Wireless & Mobile Communication (Sessional)		3.00	1.50	
Theoretical Computer Science group One subject from the following groups (depending on availability of Resources) :					
CSE 811	Advanced Algorithm Engineering	3.00		3.00	
CSE 812	Advanced Algorithm Engineering (Sessional)		3.00	1.50	
Or					
CSE 813	Computational Geometry	3.00		3.00	
CSE 814	Computational Geometry (Sessional)		3.00	1.50	
Or					
CSE 819	VLSI Design	3.00		3.00	
CSE 820	VLSI Design (Sessional)		3.00	1.50	
Artificial Intelligence group One subject from the following groups (depending on availability of Resources) :					
CSE 815	Machine Learning	3.00		3.00	
CSE 816	Machine Learning (Sessional)		3.00	1.50	
Or					
CSE 817	Pattern Recognition	3.00		3.00	
CSE 818	Pattern Recognition (Sessional)		3.00	1.50	
	Total	**9.00**	**12.00**	**15.00**	

Summary

Semester	Hours/Week		Credit	Pre-requisite
	Theory	Sessional		
Semester-1	13.00	15.00	20.50	
Semester-2	16.00	8.00	20.00	
Semester-3	15.00	12.00	21.00	
Semester-4	16.00	9.00	20.50	
Semester-5	17.00	9.00	21.50	
Semester-6	15.00	12.00	21.00	
Semester-7	16.00	12.00	22.00	
Semester-8	9.00	12.00	15.00	
Total	**117.00**	**89.00**	**161.50**	

Departmental subjects	:	105.00	credits
Science and other subjects	:	56.50	credits
Total	:	161.50	credits

DETAIL OUTLINE OF UNDERGRADUATE
COURSES OFFERED BY THE DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

SEMESTER-I

CSE 101 Introduction to Computer Systems
1 hour in a week, 1.00 Credit

Introduction to computations; Early history of computing devices; Computers; Major components of a computer; Hardware: processor, memory, I/O devices; Software: Operating system, application software; Basic architecture of a computer; Basic Information Technology; The Internet; Number system: binary, octal, hexadecimal, binary arithmetic; Basic programming concepts; Program development stages: flow charts; Programming constructs: data types, operators, expressions, statements, control statements, functions, array.

CSE 102 Introduction to Computer systems (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 101

EEE 105 Introduction to Electrical Engineering
2 hours in a week, 2.00 Credit

Fundamental electrical concepts and measuring units. Direct current: voltage, current, resistance and power. Laws of electrical circuits and methods of network analysis; Introduction to magnetic circuits. Alternating current: instantaneous and r.m.s. current, voltage and power, average power for various combinations of R,L and C circuits, phasor representation of sinusoidal quantities.

EEE 106 Introduction to Electrical Engineering (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on EEE 105.

ME 100 Mechanical Engineering Drawing- 1
3 hours in a week, 1.50 Credit

Introduction; Instruments and their uses; First and third angle projections; Orthographic drawings; Isometric views; Missing lines and views; Sectional views and conventional practices; Auxiliary views.

ME 101 Basic Mechanical Engineering
2 hours in a week, 2.00 Credit

Sources of energy: conventional and renewable; Introduction to IC engines, Refrigeration and Air conditioning systems.
Statics of particles and rigid bodies; Forces in trusses and frames; Relative motion; Kinematics of particles: Newton's Second Law of Motion; Kinematics of rigid bodies.
Introduction to Robotics; Plane, rotational and spatial motion with applications to manipulators; Geometric configurations: structural elements, linkage, arms and grippers; Motion characteristics.

ME 102 Basic Mechanical Engineering (Sessional)
3 hours in a week, 1.50 Credit

Study of workshop hand tools; Safety tools equipment used in a workshop; Different parts of a Lathe, Bench Drilling Machine, Milling Machine, Surface Grinding Machine.

MATH 101 Differential Calculus and Co-ordinate Geometry
3 hours in a week, 3.00 Credit

Differential Calculus: Limits, continuity and differentiability; Successive differentiation of various types of functions; Leibniz's Theorem; Rolle's Theorem; Mean value Theorem in finite and infinite forms; Lagrange's form of remainders; Cauchy's form of remainder; Expansion of functions; Evaluation of indeterminate forms by L' Hospital's : ule; Partial differentiation; Euler's Theorem; Tangent and Normal, Sub tangent and subnormal in Cartesian and polar co-ordinates; Maximum and minimum values of functions of single variable; Points of inflexion; Curvature, radius of curvature, center of curvature; Asymptotes, curve tracing.
Co-ordinate Geometry : Transformation of co-ordinates axes and its uses: Equation of conics and its reduction to standard forms; Pair of straight lines; Homogeneous equations of second degree: Angle between a pair of straight lines; Pair of lines joining the origin to the point of intersection of two given curves, circles; System of circles; Orthogonal circles; Radical axis, radical center, properties of radical axes; Coaxial circles and limiting points; Equations of parabola; ellipse and hyperbola in Cartesian and polar co-ordinates; Tangents and normals, pair of tangents; Chord of contact; Chord in terms of its middle points; Pole and polar parametric co-ordinates; Diameters; conjugate diameters and their properties; Director circles and asymptotes.

PHY 101 Physics
(Heat and Thermodynamics, Structure of Matter, Waves and Oscillations, and Physical Optics)
3 hours in a week, 3.00 Credit

Heat and Thermodynamics : Principle of temperature measurements: platinum resistance thermometer, thermo-electric thermometer, pyrometer; Kinetic theory of gases: Maxwell's distribution of molecular speeds, mean free path, equipartition of energy, Brownian motion, Van der Waal's Equation of state, review of the First Law of thermodynamics and its application, reversible and irreversible processes, Second Law of thermodynamics, Carnot cycle; Efficiency of heat engines, Carnot's Theorem, entropy and disorder, thermodynamic functions, Maxwell relations, Clausius-Clapeyron Equation, Gibbs Phase Rule, Third Law of thermodynamics.
Structure of Matter : Crystalline and non-crystalline solids, single crystal and polycrystalline solids, unit cell, crystal systems, co-ordinations number, crystal planes and directions, sodium chloride and CsCl structure, packing factor, Miller indices, relation between inter-planar spacing and Miller indices, Bragg's Law, methods of determination of inter-planar spacing from diffraction patterns; Defects in solids: point defects, line defects; Bonds in solids, inter-atomic distances, calculation of cohesive and bonding energy; Introduction to band theory: distinction between metal, semiconductor and insulator.
Waves and Oscillations : Differential equation of a simple harmonic oscillator, total energy and average energy, combination of simple harmonic oscillations, Lissajous figures, spring-mass system, calculation of time period of torsional pendulum, damped oscillation, determination of damping co-efficient, forced oscillation, resonance, two-body oscillations, Reduced mass, differential equation of a progressive wave, power and intensity of wave motion, stationary wave, group velocity and phase velocity, architectural acoustics, reverberation and Sabine's formula.
Physical Optics : Theories of light; Interference of light, Young's double slit experiment; Displacements of fringes and its uses; Fresnel Bi-prism, interference at wedge shaped films, Newton's rings, interferometers; Diffraction of light: Fresnel and Fraunhoffer diffraction, diffraction by single slit, diffraction from a circular aperture, resolving power of optical instruments, diffraction at double slit & N-slits-diffraction grating; Polarization: production and analysis of polarized light, Brewster's law, Malus law, Polarization by double refraction, retardation plates, Nicol prism, optical activity, polarimeters, Polaroid.

PHY 102 Physics (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on PHY 101.

SS Social Studies
2 hours in a week, 2.00 Credit

Anthropological background of Bangladesh & evolution of Bangla literature, archaeological heritage of Bangladesh, history & culture of Bangladesh, social structure of Bangladesh, Bangladesh profile.

SEMESTER-II

CSE 201 Structured Programming Language
3 hours in a week, 3.00 Credit

Structured programming language: data types, operators, expressions, control structures; Functions and program structure: parameter passing conventions, scope rules and storage classes, recursion; Header files; Preprocessor; Pointers and arrays; Strings; Multidimensional array; User defined data types: structures, unions, enumerations; Input and Output: standard input and output, formatted input and output, file access; Variable length argument list; Command line parameters; Error Handling; Graphics; Linking; Library functions.
Reference language: C

CSE 202 Structured Programming Language (Sessional)
3 hours in a week. 1.50 Credit

Laboratory works based on CSE 201.

CSE 203 Discrete Mathematics
3 hours in a week, 3.00 Credit

Set theory; Relations; Functions; Graph theory; Propositional calculus and predicate calculus; Mathematical reasoning: induction, contradiction and recursion; counting; Principles of inclusion and exclusion; Recurrence relations; Algebraic structures: rings and groups.

MATH 201 Integral Calculus, Ordinary and Partial Differential Equations, and Series Solutions
3 hours in a week, 3.00 Credit

Integral Calculus: Definitions of integration; Integration by the method of substitutions; Integration by parts; Standard integrals; Integration by the method of successive reduction; Definite integrals and its properties and use in summing series; Walli's formula, Improper integrals, Beta function and Gamma function; Area under a plane curve in Cartesian and polar co-ordinates; Area of the region enclosed by two curves in Cartesian and polar co-ordinates; Trapezoidal rule, Simpson's rule. Arc lengths of curves in Cartesian and polar co-ordinates, parametic and pedal equations; Intrinsic equation; Volume of solids of revolution; Volume of hollow solids of revolution by shell method. Area of surface of revolution; Jacobian, multiple integrals and their application.
Ordinary Differential Equation (ODE): Degree and order of ordinary differential equations; Formation of differential equations; Solution of first order differential equations by various methods; Solution of first order but higher degree ordinary differential equations; Solution of General linear equations of second and higher orders with constant coefficients; Solution of homogeneous linear - equations and its applications; Solution of differential equations of higher order when dependent and independent variables are absent; Solution of differential equation by the method based on factorization of operators.
Partial Differential Equations (PDE): Four rules for solving simultaneous equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$
Lagrange's method of solving PDE of order one; Integral surfaces passing through a given curve; Nonlinear PDE of order one (complete, particular, singular and general integrals): standard forms $f(p,q) = 0$, $z = px + qy + f(p,q)$, $f(p,q.z) = 0$, $f_1(x,p) = f_2(v,$ q); Charpit's method; Second order PDE: its nomenclature and classifications to canonical (standard)-parabolic, elliptic, hyperbolic; Solution by separation of variables. Linear PDE with constant coefficients.
Series Solution: Solution of differential equations in series by the method of Frobenius; Bessel's functions, Legendre's polynomials and their properties.

CHEM 201 Chemistry
3 hours in a week, 3.00 Credit

Atomic structure, quantum numbers, electronic configuration, periodic table; Properties and uses of noble gases; Different types of chemical bonds and their properties; Molecular structure of compounds; Selective organic reactions; Different types of solutions and their compositions; Phase rule, phase diagram of monocomponent system; Properties of dilute solutions; Thermochemistry, chemical kinetics, chemical equilibria; Ionization of water and pH concept; Electrical properties of Solution.

CHEM 202 Chemistry (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CHEM 201.

ENG 201 English Language
2 hours in a week, 2.00 Credit

English phonetics: the places and manners of articulation of the English sounds; Vocabulary; English grammar: construction of sentences, some grammatical problems; Comprehension; Paragraph writing; Precis writing; Amplification; Report writing; Business communication and tenders; Short stories written by some well-known classic writers.

ENG 202 Communication in English (Practice)
2 hours in a week, 1.00 Credit

Grammar: Tense, article, preposition, subject-verb agreement, clause, conditional and sentence structure.
Vocabulary building: Correct and precise diction, affixes,. level of appropriateness. Colloquial and standard. informal and formal.
Developing reading skill: Strategies of reading - skimming. scanning, predicting. inferring; analyzing and interpreting variety of texts; practicing comprehension from literary and nonliterary texts.
Developing writing skill: Sentences, sentence variety, generating sentences; clarity and correctness of sentences, linking sentences to form paragraphs, writing paragraphs, essays, reports, formal and informal letters.
Listening skill and note taking: Listening to recorded texts and class lectures and learning to take useful notes based on listening,
Developing speaking skill.: Oral skills including communicative expressions for personal identification, life at home, giving advice and opinion, instruction and directions, requests, complaints, apologies, describing people and places, narrating events.

SS 201 Government and Public Administration
2 hours in a week, 2 Credit

Constitution of Bangladesh, fundamental rights as enunciated in Bangladesh constitution, forms of government of Bangladesh, organs of government : a) legislative assembly: composition, powers and functions, b) judiciary-composition, powers and functions, c) executive public administration, role of government, good governance, accountability and transparency of the public servant, local government, human resource management and planning.

SEMESTER -III

CSE 301 Object Oriented Programming Language
3 hours in a week, 3.00 Credit

Philosophy of Object Oriented Programming (OOP); Advantages of OOP over structured programming; Encapsulation, classes and objects, access specifiers, static and non-static members; Constructors, destructors and copy constructors; Array of objects, object pointers, and object references; Inheritance: single and multiple inheritance; Polymorphism: overloading, abstract classes, virtual functions and overriding; Exceptions: Object Oriented I/O; Template functions and classes; Multi-threaded Programming. Reference languages: C++ and Java.

CSE 302 Object Oriented Programming Language (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 301.

CSE 303 Data Structures
3 hours in a week, 3.00 Credit

Internal data representation; Abstract data types; Elementary data structures: arrays, lists, stacks, queues, trees, graphs; Advanced data Structures: heaps, Fibonacci heaps, B-trees; Recursion, sorting, searching, hashing, storage management.

CSE 304 Data Structures (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 303.

CSE 305 Digital Logic Design
3 hours in a week, 3 Credit

Digital logic: Boolean algebra, De Morgan's Theorems, logic gates and their truth tables, canonical forms, combinational logic circuits, minimization techniques; Arithmetic and data handling logic circuits, decoders and encoders, multiplexers and demultiplexers; Combinational circuit design; Flip-flops, race around problems; Counters: asynchronous counters, synchronous counters and their applications; PLA design; Synchronous and asynchronous logic design; State diagram, Mealy and Moore machines; State minimizations and assignments; Pulse mode logic; Fundamental mode design.

CSE 306 Digital Logic Design (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 305.

EEE 309 Electronic Devices and Circuits
3 hours in a week, 3.00 Credit

Introduction to semiconductors, p-type and n-type semiconductors; p-n junction diode characteristics; Diode applications: half and full wave rectifiers, clipping and clamping circuits, regulated power supply using zener diode.
Bipolar Junction Transistor (BJT): principle of operation, I-V characteristics; Transistor circuit configurations (CE, CB, CC), BJT biasing, load lines; BJTs at low frequencies; Hybrid model, -h parameters, simplified hybrid model; Small-signal analysis of single and multi-stage amplifiers, frequency response of BJT amplifier.
Field Effect Transistors (FET): principle of operation of JFET and MOSFET; Depletion and enhancement type NMOS and PMOS; biasing of FETs; Low and high frequency models of FETs, Switching circuits using FETs; Introduction to CMOS.
Operational Amplifiers (OPAMP): linear applications of OPAMPs, gain, input and output impedances, active filters, frequency response and noise.
Introduction to feedback, Oscillators, Silicon Controlled Rectifiers (SCR), TRIAC, DIAC and UJT: characteristics and applications; Introduction to IC fabrication processes.

EEE 310 Electronic Devices and Circuits (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on EEE 309.

MATH 301 Complex Variable and Statistics
3 hours in a week, 3.00 Credit

Complex Variable: Complex number system; General functions of a complex variable; Limits and continuity of a function of complex variable and related theorems; Complex differentiation and the Cauchy-Riemann Equations; Mapping by elementary functions; Line integral of a complex function; Cauchy's Integral Theorem; Cauchy's Integral Formula; Liouville's Theorem; Taylor's Theorem and Laurent's Theorem. Singular points; Residue; Cauchy's Residue Theorem. Evaluation of residues; Contour integration; Conformal mapping.

Statistics: Frequency distribution; Mean, median, mode and other measures of central tendency; Standard deviation and other measures of dispersion; Moments, skewness and kurtosis; Elementary probability theory and discontinuous probability distribution, (binomial, Poisson and negative binomial); Characteristics of distributions; Elementary sampling theory; Estimation; Hypothesis testing and regression analysis.

SEMESTER -IV

CSE 401 Algorithms
3 hours in a week, 3 Credit

Techniques for analysis of algorithms; Methods for the design of efficient algorithms: divide and conquer. greedy method, dynamic programming, back tracking, branch and bound; Basic search and traversal techniques; Topological sorting: Connected components, spanning trees, shortest paths; Flow algorithms; Approximation algorithms: Parallel algorithms: Algebraic simplification and transformations; Lower bound theory; NP-completeness, NP-hard and NP-complete problems.

CSE 402 Algorithms (Sessional)
3 hours in a week, 1.50 Credit

Laboratory work based on CSE 401.

CSE 403 Digital Electronics and Pulse Techniques
3 hours in a week, 3 Credit

Diode logic gates, transistor switches, transistor gates, MOS gates; Logic Families: TTL, ECL, IlL and CMOS logic with operation details Propagation delay, product and noise immunity; Open collector and high impedance gates; Electronic circuits for flip-flops, counters and register, memory systems, PLAs; A/D and D/A converters with applications; S/H circuits, LED, LCD and optically coupled oscillators; Non-linear applications of OP AMPs; Analog switches. Linear wave shaping: diode wave shaping techniques, clipping and clamping circuits. comparator circuits, switching circuits; Pulse transformers, pulse transmission, pulse generation; monostable, bistable and astable tnultivibrators, Schmitt trigger, blocking oscillators and time-base circuit; Timing circuits; Simple voltage sweeps, linear current sweeps.

CSE, 404 Digital Electronics and Pulse Techniques (Sessiona)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 403.

CSE: 405 Theory of Computation
2 hours in a week, 2 Credit

Language theory; Finite automata: deterministic finite automata, nondeterministic (finite automata, equivalence and conversion of deterministic and nondeterministic. finite automata, pushdown automata; Context free languages; Context free grammars; Turing Machines: basic machines, configuration, computing with Turing machines, combining Turing machines; Undesirability.

EEE 407 Electrical Drives and Instrumentation
3 hours in a week, 3.00 Credit

Introduction to three phase circuits, alternators and transformers; Principles of operation of DC, synchronous, induction, universal, and stepper motors; Thyristor and microprocessor based speed control of motors.
Instrumentation amplifiers: differential, logarithmic and chopper amplifiers; Frequency and voltage measurements using digital techniques: Recorders and display devices, spectrum analyzers and logic analyzers: Data acquisition and interfacing to microprocessor based systems: Transducers: terminology, types, principles and application of photovoltaic, piezoelectric, thermoelectric, variable reactance and opto-electronic transducers; Noise reduction in instrumentation.

FEE 408 Electrical Drives and Instrumentation (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on EEE 407.

MATH 401 Matrices, Vectors, Fourier Analysis, and Laplace Transforms
3 hours in a week, 3.00 Credit

Matrices: Definition of matrix; Different types of matrices; Algebra of matrices; Adjoint and inverse of a matrix; Elementary transformations of matrices; Matrix polynomials; Calay-Hamilton theory with uses of rank and nullity; Normal and canonical forms; Solution of linear equations; Eigenvalues and eigenvectors.
Vector Spaces: Definition and properties, subspaces, basis and dimension, change of basis; Linear Transformation (LT): definition and properties, linear operator matrix, geometry of LT, standard plane LT.
Vector Algebra: Scalars and vectors, equality of vectors; Addition and subtraction of vectors; Multiplication of vectors by scalars; Scalar and vector product of two vectors and their geometrical interpretation; Triple products and multiple products; Linear dependence and independence of vectors.
Vector Calculus: Differentiation and integration of vectors together with elementary applications; Definition of line, surface and volume integrals; Gradient, divergence and curl of point functions, various formulae, Gauss's theorem, Stoke's theorem, Green's theorem.
Fourier Analysis: Real and complex form of Fourier series; Finite transform; Fourier Integral; Fourier transforms and their uses in solving boundary value problems of wave equations.
Laplace Transforms: Definition; Laplace transforms of some elementary functions; Sufficient conditions for existence of Laplace transforms; Inverse Laplace transforms; Laplace transforms of derivatives. The unit step function; Periodic function; Some special theorems on Laplace transforms; Partial fraction; Solutions of differential equations by Laplace transforms; Evaluation of improper integrals.

SS 401 Managerial Economics
2 hours in a week, 2.00 Credit

Micro and macro economics, market economy, GDP, GNP, NNP with reference to Bangladesh, globalization, world trade organization and Bangladesh economy, sustainable development, disaster management in Bangladesh, gender: concept and issues.

SEMESTER -V

CSE 501 Database Management System
3 hours in a week, 3.00 Credit

Concepts of database systems; Models: Entity-Relationship model, Relational model; Relational algebra; SQL; Integrity constraint; Relational database design; File organization and retrieval, file indexing; Transaction. manager; Concurrency controller; Recovery manager; Security system; Database administration; Advanced database management systems: distributed, multimedia, objectoriented, object-relational; Some applications using SQL.

CSE 502 Database Management System (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 501.

CSE 503 Computer Architecture
3 hours in a week, 3.00 Credit

Information representation; Measuring performance; Instructions and data access methods: operations and operands of computer hardware, representing. instruction, addressing styles; Arithmetic Logic Unit (ALU) operations, floating point operations, designing ALU; Processor design: datapaths - single cycle and multicycle implementations; Control Unit design - hardwared and microprogrammed; Hazards; Exceptions; Pipeline: pipelined datapath and control, superscalar and dynamic pipelining; Memory organization: cache, virtual memory, channels; DMA and Interrupts: Buses; Multiprocessors: types of multiprocessors, performance, single bus multiprocessors, multiprocessors connected by network, clusters.

CSE 505 Microprocessors and Microcontrollers
3 hours in a week, 3.00 Credit

Introduction to 8-bit, 16-bit, and 32-bit microprocessors: architecture, addressing modes, instruction set, interrupts, multi-tasking and virtual memory; Memory interface; Bus interface; Arithmetic co-processor; Microcontrollers; Integrating microprocessor with interfacing chips.

CSE 506 Microprocessors mid Microcontrollers (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 505.

CSE 507 Operating System
3 hours in a week, 3.00 Credit

Operating System: its role in computer systems; Operating system concepts; Operating system structure; Process: process model and implementation, Inter-Process Communication (1PC), classical IPC problems, process scheduling, multiprocessing and time-sharing; Memory management: swapping, paging, segmentation, virtual memory; Input/Output: hardware, software, disk, terminals, clocks; Deadlock: resource allocation and deadlock, deadlock detection, prevention and recovery; File Systems: files, directories, security, protection; Case study of some operating systems.

CSE 508 Operating System (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 507.

CSE 509 Communication-I
3 hours in a week, 3.00 Credit

Signal and random processes; Review of ,Fourier Transform; Hilbert Transform, continuous wave modulation: AM, PM, FM; Sampling theorem; Pulse modulation: -PAM, PDM, PPM, PCM, companding, delta modulation, differential PCM; Multiple access techniques: TDM, FDM; Digital modulation: ASK, PSK, BPSK, QPSK; FSK, MSK, constellation, bit error rate (BER); Noise; Echo cancellation; Intersymbol Interference; Concept of channel coding and capacity.

SS 501 Project Planning and Management
2 hours in a week, 2.00 Credit

Definition of project, program, project objectives, why project management, Function of project management; Importance & objectives of project planning; Project organization structure, Matrix organizational design, project conflict resolution and project negotiation; benefit of project planning; project life cycle; project identification, project evaluation (social, technical and financial);
Project Implementation: Pricing and cost estimation, project scheduling, CPM, PERT, project management inforation system, project monitoring, evaluation and control; project termination: terminating the project, project audit, project final report; Case study.

SEMESTER -VI

CSE 601 Mathematical Analysis for Computer Science
3 hours in a week, 3.00 Credit

Recurrent problems; Manipulation of sums; Number theory; Special numbers; Generating functions. Random variables; Stochastic process; Markov chains: discrete parameter, continuous parameter, birth-death process; Queuing models: birth-death model, Markovian model, open and closed queuing network; Application of queuing models.

CSE 603 Compiler
3 hours in a week, 3.00 Credit

Introduction to compiling; Basic issues; Lexical analysis; Syntax analysis; Syntax-directed translation; Semantic analysis: type-checking; Run-time environments; Intermediate code generation; Code generation; Code optimization.

CSE 604 Compiler (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 603 and project works using some lexical analyzer and parser designing tools.

CSE 605 Software Engineering and Information System Design
3 hours in a week, 3.00 Credit

Concepts of Software Engineering, Software Engineering paradigms, Different phases of software System Development, Different types of information, qualities of information. Project Management Concepts, Software process and project Metrics, Software Project Planning, Risk Analysis and management, Project Scheduling and Tracking.
Analysis Concepts and principles: requirement analysis, Analysis modeling, data modeling.
Design concepts and principles, Architectural design, User Interface design, Object Oriented software development and design: Iterative Development and the Unified Process. Sequential waterfall life cycles, Inception. Use case model for requirement writing, Elaboration using System Sequence Diagram, Domain Model. Visualizing concept classes. UML diagrams, Interaction and Collaboration Diagram for designing Software. Designing Objects with responsibilities. GRASP patterns with General Principles in assigning responsibilities: Information expert, Creator, Low Coupling and High Cohesion, Creating design class diagrams and mapping design to codes. Advanced GRASP patterns: Polymorphism, Pure Fabrication, Indirection, Project Variation. GoF Design Patterns: Adapter, Factory, Singleton, Strategy, Composite, Facade, and Observer. Software Testing: White Box and Black Box testing. Basis Path Testing. Testing for specialized environment. Software testing strategies: Unit Testing, Integration Testing, Validation Testing, System Testing, Art of debugging. Analysis of System Maintenance and upgrading: Software repair, downtime, error and faults, specification and correction, Maintenance cost models, documentation. Software Quality Assurance, Quality factors. Software quality measures. Cost Impact of Software defects. Concepts of Software reliability, availability and safety. Function based metrics and bang metrics. Metrics for analysis and design model. Metrics for sourer code, testing and maintenance.

CSE 607 Numerical Methods
3 hours in a week, 3 Credit

Introduction; Solution of algebraic and transcendental equations: method of iteration, False Position method, Newton-Rhapson method; Solution of simultaneous linear equations: Cramer's rule, Iteration method, Gauss-Jordan Elimination method, Choleski's process; Interpolation: diagonal and horizontal difference, differences of a polynomial, Newton's formula for forward' and backward i nterpolation, Spline interpolation: Numerical differentiation and integration; Solution of ordinary differential equations: Euler's method, Picard's method, Milne's method, Taylor's series method, Runge-Kutta method; Least squares approximation of functions: linear and polynomial regression, fitting exponential and trigonornetric functions.

CSE 608 Numerical Methods (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 607

CSE 609 Computer Networks
3 hours in a week, 3.00 Credit

Protocol hierarchies; Data link control: HLDC; DLL- in Internet; DLL of ATM; LAN Protocols: Standards IEEE 802.*; Hubs, Bridges, and Switches, FDDI, Fast Ethernet; Routing algorithm; Congestion control; Internetworking, WAN; Fragmentation; Firewalls; IPV4, IPV6, ARP, RARP, Mobile IP, Network layer of ATM; Transport protocols; Transmission control protocol: connection management, transmission policy, congestion control, timer management; UDP; AAL of ATM; Network security: Cryptography, DES, IDEA, public key algorithm; Authentication; Digital signatures; Gigabit Ethernet; Domain Name System: Name servers; Email and its privacy; SNMP; HTTP; World Wide Web.

CSE 610 Computer Networks (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 609.

CSE 612 Software Developments
3 hours in a week, 1.50 Credit

Term project of making software on some practical problems with sound software engineering practices.

SEMESTER -VII

CSE 700 Project and Thesis
6 hours in a week, 3.00 Credit

Study of problems in the field of Computer Science and Engineering.

CSE 701 Artificial Intelligence
3 hours in a week, 3.00 Credit

Introduction to old and new Al techniques; Knowledge representation; Propositional and first order logic, inference in first order logic; Frame problem; Search techniques in Al; Game playing; Planning; Probabilistic reasoning; Learning in symbolic and non-symbolic representation; Natural language processing. Introduction to expert system.

CSE 702 Artificial Intelligence (Sessional)
3 hours in alternate week, 1.50 Credit

Laboratory works based on CSE 701.

CSE 703 Peripheral and Interfacing
3 hours in a week, 3.00 Credit

Designing I/O system; I/O devices; Designing Microprocessor based system with interfacing chips; Programmable peripheral interface (interface to AID and D/A converter); Keyboard/display interface; Programmable timer; Programmable interrupt controller, DMA controller; Design using MSI and LSI components; Design of. memory subsystem using SRAM and DRAM; Design of various components of a computer: ALU, memory and control unit - hardwired and micro programmed; Microprocessor based designs; Computer BUS Standards; Design special purpose controllers.

CSE 704 Peripheral and Interfacing (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 703.

IPE 701 Industrial Management
2 hours in a week, 2.00 Credit

Introduction, evolution, management function, organization and environment.
Organization: Theory and structure; Coordination; Span of control; Authority delegation; Groups; Committee and task force; Manpower planning.
Personnel Management: Scope; Importance; Need hierarchy; Motivation; Job redesign; Leadership; Participative management; Training; Performance appraisal; Wages and incentives; Informal groups; Organizational change and conflict.
Cost and Financial Management: Elements of costs of products depreciation; Break-even analysis; Investment analysis; Benefit cost analysis.
Management Accounting: Cost planning and control; Budget and budgetary control; Development planning process.
Marketing Management: Concepts; Strategy; Sales promotion; Patent laws.
Technology Management: Management of innovation and changes; Technology life cycle: Case studies.

SS 703 Sociology and Industrial Law
2 hours in a week, 2.00 Credit

Sociological perspective: definition, nature, scope and importance of sociology; Sociology and scientific approach: methods of social research, stages of social research; Primary concepts of sociology: society, community, association, institution, group; Social evolution: stages in the evolution of human civilization; Culture: definition, characteristics, culture contents (material and non-material), cultural lag, culture and civilization: Industrial revolution: the growth of capitalism, features and social consequences, socialism; Social organization: family, forms and functions of family, functions of family in modern industrial society, marriage, forms of marriage, functions of marriage; Social stratification: main types of social stratification - slavery-caste and social class and status, social stratification and social mobility; Social control: religion and morality, custom and public opinion, taboo-law, state and education; Social change: changeevolution-progress-development, factors in social change; Society and population: human migration, population and resources; Some current social problems: crime, deviance, juvenile delinquency, youth unrest;

Technology and society: effects of technological factors on social life.
Principles of law of contracts; Company law: law regarding formation, incorporation, management and winding up of companies; Labor law: law in relation to wages hours, health, safety and other condition to work; The trade union legislation arbitration, the policy of the state in relation to labor; The Factory Act (1965); The Law of compensation (1965).

SS 705 Financial Management & Accounting
3 hours in a week, 3.00 Credit

Budgetary system (Revenue), Budgetary System (ADP), Drawing and disbursing activities, financial powers, public procurement rules/act, store management, accounting, auditing system : a) audit procedure, objection, reply and settlement, b) performance and accounts audit.

CSE 705 Simulation and Modeling
3 hours in a week, 3.00 Credit

Simulation modeling basics: systems, models and simulation; Classification *of* simulation models; Steps in a simulation study; Concepts in discrete-event simulation: event-scheduling vs. process interaction approaches, time-advance mechanism, organization of a discrete-event simulation model; Continuous simulation models; Combined discreet-continuous models; Monte Carlo simulation; Simulation *of* queuing systems.
Building valid and credible simulation models: validation principles and techniques, statistical procedures for comparing real-world observations and simulated outputs, input modeling; Generating random numbers and random variates; Output analysis.
Simulation languages; Analysis and modeling *of* some practical systems.

OR

CSE 707 Basic Graph Theory
3 hours in a week, 3.00 Credit

Graphs: simple graphs, digraphs, subgraphs, vertex-degrees, walks, paths and cycles; Trees, spanning trees in graphs, distance in graphs; Complementary graphs, cut-vertices, bridges and blocks, k-connected graphs; Euler tours, Hamiltonian cycles, Chinese Postman Problem, Traveling Salesman Problem; Chromatic number, chromatic polynomials, chromatic index, Vizing's theorem, planar graphs, perfect graphs.

OR

CSE 709 Fault Tolerant Systems
3 hours in a week, 3.00 Credit

Introduction of Fault Tolerant Systems and architectures; Fault detection and location in combinational and sequential circuits; Fault test generation for combinational and sequential circuits; Digital simulation as a diagnostic tool; Automatic test pattern generator; Fault modeling; Automatic test equipment, faults in memory, memory test pattern and reliability; Performance monitoring, self checking circuits, burst error correction and triple modular redundancy; Maintenance processors.

OR

CSE 711 Digital Image Processing
3 hours in a week, 3.00 Credit

Introduction; Digitization of images and its properties; Data structures for image analysis; Image processing; Segmentation: detection of discontinuities, edge linking and boundary detection, thresholding, region oriented segmentation, use of motion in segmentation; Image transforms: Z-transform, 2D Fourier transform, discrete cosine transform, Hadamard transform, Walsh transform, Slant transform; Image compression: run-length coding, transform coding, standards.

OR

CSE 713 Basic Multimedia Theory
3 hours in a week, 3.00 Credit

Multimedia systems - introduction; Coding and compression standards; Architecture issues in multimedia; Operating systems issues in multimedia - real-time OS issues, synchronization, interrupt handling; Database issues in multimedia - indexing and storing multimedia data, disk placement, disk scheduling, searching for a multimedia document; Networking issues in multimedia - Quality-of-service guarantees, resource reservation, traffic specification, shaping; and monitoring, admission control; Multicasting issues; Session directories; Protocols for controlling sessions: Security issues in multimedia - digital watermarking, partial encryption schemes for video streams; Multimedia applications - audio and video conferencing, video on demand, voice over IP.

SEMESTER -VII1

CSE 800 Project and Thesis
6 hours in a week, 3.00 Credit

Study of problems in the field of Computer Science and Engineering.

CSE 801 Computer Graphics
3 hours in a week, 3.00 Credit

Graphics hardware: display devices, input devices etc; Basic raster graphics algorithms for drawing 2D primitives; Two-dimensional and three-dimensional viewing, clipping and transformations; Threedimensional object representations: polygon surface, B-Splinc curves and surfaces, BSP trees, Octrees, Fractal-Geometry methods; Visible surface detection methods: Z-buffer method, BSP tree method, Ray casting method; Illumination models; Surface rendering methods: polygon rendering, ray tracing, terrain visualization with height mapping, modeling surface details with texture mapping; Color models; Computer animation.

CSE 802 Computer Graphics (Sessional)
3 hours in alternate week, 1.50 Credit

Laboratory works based on CSE 801.

CSE 803 Introduction to Distributed Computing
3 hours in a week, 3.00 Credit

Introduction to Parallel and Distributed Systems: Architecture, Challenges, principle and paradigm, Middleware: Introduction to Erlang, Communication: Synchronous and asynchronous communication abstraction and model, message passing and shared memory. Replication & Consistency: Control replication, data replication, consistency model and protocols. Distributed Shared Memory: Design issue, Implementation issue, consistency issue, Shared Memory model, MPI, LINDA, ORCA, case study: Trademark, JACKAL, Distributed Objects: Introduction, remote objects, CORBA, Distributed Shared object, Globe. Synchronization & Coordination: Distributed algorithms, time and clocks, Local state, Global State, consistency protocols, coordination elections, distributed transactions management. Fault Tolerance: Failure model, Faults, Process Resilience, reliable communication, Recovery, Checkpoints and checkpoint algorithms, Rollback recovery algorithms, Security: Threats and attacks, policy and mechanism, Design issue, design of cryptographic algorithms, cryptographic protocols, Key distribution, authentication, secure communication, auditing. Naming: Basic concept, Naming Services, DNS, Attribute based naming, X.500 and LDAP, Distributed File Systems: Client perspective, Server perspective, NFS, Coda, Google File System (GFS), Parallel Programming: parallel computing, parallel programming structure, Planet Lab, Grid: Grid model, Grid Middleware, Globus toolkit, Planet Lab Overview.

CSE 807 Communication II
3 hours in a week, 3.00 Credit

Synchronous and asynchronous communications; Hardware interfaces, multiplexers, concentrators and buffers; Communication mediums and their characteristics; Data communication services: SMDS and ATM; Error control codes: linear block codes, cyclic codes, MLDC codes, convolution codes, Trellis code modulation; Digital switching: space and time division switching; Radio system design; Fiber optics communication: transmitter, receivers, network components, WDM; Line coding, trunks, multiplexing, switching, ATM switches; Satellite communications: frequency bands and characteristics, types of satellites, transmission impairments, capacity allocation; Multiple access techniques.

CSE 808 Communication II (Sessional)
3 hours in alternate week, 1.50 Credit

Laboratory works based on CSE 807.

CSE 809 Wireless & Mobile Communication
3 hours in a week, 3.00 Credit

Cellular concepts: frequency reuse, handoff strategies, interference and system capacity, grade of service, improving capacity and coverage, call blocking probability; Propagation effects: outdoor propagation models, indoor propagation models, power control, Doppler's effect, small and large scale fades; Wireless LAN Technology; IEEE 802.11:

standard, protocol architecture, physical layer and media access control; Mobile IP; Wireless Application Protocol; IEEE 802.16 Broadband Wireless Access; Brief review of 2^{d} and 3$^{`d}$ generation wireless: GSM, GPRS, CDMA; Cordless system; Wireless local loop; Bluetooth: overview and base band specifications.

CSE 810 Wireless & Mobile Communication (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 809.

CSE 811 Advanced Algorithm Engineering
3 hours in a week, 3.00 Credit

Computational complexity, Parameterized complexity, Algorithms for combinatorial optimization, practical computing and heuristics, Approximation algorithms, LP based approximation algorithms, randomized algorithms, Experimental algorithmic, Algorithms in state of-the-art fields like Bioinformatics, Grid Computing, VLSI design etc.

CS1; 812 Advanced Algorithm Engineering (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 811.

CSE 813 Computational Geometry
3 hours in a week, 3.00 Credit

Algorithm and complexity of fundamental geometric objects: polygon triangulations and art gallery theorem, polygon partitioning, convex hulls in 2-dimension.
Proximity: Voronoi diagrams and Delaunary triangulations. .
Graph Drawing: drawing styles and applications, drawing of rooted trees, straight line drawing of planar graphs.

CSE 814 Computational Geometry (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 813.

CSE 815 Machine Learning
3 hours in a week, 3.00 Credit

Introduction to machine learning; Learning algorithms: supervised, unsupervised, reinforcement, attribute based, neural network based, relational supervised and negative correlation; Genetic algorithm,
genetic programming and evolutionary programming; Practical application of machine learning.

CSE 816 Machine Learning (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 815.

CSE 817 Pattern Recognition
3 hours in a week, 3.00 Credit

Pattern Recognition: introduction, importance; Statistical and Neural Pattern Recognition: Bayesian classifier, Bayes decision theory, discriminant functions and decision surfaces; Bayesian classifier for normal distributions: Linear classifiers: discriminant functions and decision hyperplanes, Perceptron algorithm and its variants, Kessler's construction; Nonlinear classifiers: two and. three layer perceptions, backpropagation algorithm and its variants; Template matching: optimal path searching techniques, dynamic programming methods, correlation based matching and 2D log search algorithm for image matching; Context dependent classification: Viterbi algorithm, channel equalization, observable and hidden Markov models, three problems of HMM and their application in speech recognition; Syntactic Pattern Recognition: introduction to Syntactic Pattern Recognition, grammar based approach, parsing, graph-based approach; Unsupervised classification: basic concepts of clustering, proximity measures, categories of clustering algorithms, sequential clustering algorithms.

CSE 818 Pattern Recognition (Sessional)
3 hours in a week, 1.50 Credit

Introduction to MATLAB; Laboratory works based on CSE 817 and using MATLAB: Bayesian classifier, linear classifier, nonlinear classifier, image matching, speech recognition, context dependent classification.

CSE 819 VLSI Design
3 hours in a week, 3.00 Credit

VLSI design methodology: top-down design approach, technology trends and design automation algorithms; Introduction to CMOS inverters and basic gates; Brief overview of CMOS fabrication process: layout and design rules; Basic CMOS circuit characteristics and performance estimation; Buffer circuit design; Complex CMOS gates, CMOS building blocks: adder, multiplier; data path and memory structures.
Hardware modeling: hardware modeling languages, logic networks, state diagrams, data-flow and sequencing graphs, behavioral . optimization.
Architectural Synthesis: circuit specification, strategies for architectural optimization, data-path synthesis, control unit synthesis and synthesis of pipelined circuits.
ASIC design using FPGA and PLDs.

CSE 820 VLSI Design (Sessional)
3 hours in a week, 1.50 Credit

Laboratory works based on CSE 819.