

Summary of Courses

1st Year 2nd Semester

Sl. No.	Course No.	Course Title	Theory hrs/week	Sessional hrs/week	Credits
1	CSE-1121	Structured Programming Language	4	0	4.00
2	CSE-1122	Structured Programming Language Sessional	0	3	1.50
3	CSE-1823	Digital Logic Design	3	0	3.00
4	CSE-1824	Digital Logic Design Sessional	0	3/2	0.75
5	CSE-1124	Drawing & CAD Project Sessional	0	3/2	0.75
6	Math-1421	Mathematics – II	4	0	4.00
7	Ph-1423	Physics – II	4	0	4.00
8	Ph-1424	Physics – II Sessional	0	3/2	0.75
9	Hum-1427	English and Economics	3	0	3.00
Total			18	7.5	21.75

Contact Hours: $18T + 7.5 S = 25.50$ hrs/week

Total credits: 21.75

No. of Theory Courses: 5

No. of Lab / Sessional courses: 4

Detailed Syllabus

CSE-1121 Structured Programming Language

4 Hours/week

4.00 Credits

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 – 1122 Structured Programming Language Sessional

3 Hours/week

1.50 Credits

Sessional based on Structured Programming Language (CSE – 1121)

CSE-1823 Digital Logic Design

3 Hours/week

3.00 Credits

Digital logic, Boolean algebra, Boolean function, canonical forms, minimization of Boolean functions, logic gates and their truth tables, combinational logic design, arithmetic and data handling logic circuits. Decoders, encoders, multiplexers, demultiplexers, flip-flops, counters, and registers.

Review of set theory, reliable design and fault diagnosis hazards, fault detection in combinational circuits, fault location experiments, threshold logic. Synchronous sequential circuits and iterative networks, sequential machine state equivalence and machine minimization, asynchronous sequential circuits, finite state recognizer-regular expressions, transition graphs.

CSE-1824 Digital Logic Design Sessional

3/2 Hours/ week

0.75 Credits

Sessional based on Digital Logic Design (CSE-1823).

CSE – 1124 Drawing and CAD Sessional

3/2 Hours/ week

0.75 Credits

Introduction, scale drawing, sectional view, isometric views, missing line, auxiliary view, detail and assembly drawing, project on Engineering drawing and CAD using AutoCAD or contemporary packages instructed by the teachers.

Math – 1421 Mathematics – II

4 Hours/ week

4.00 Credits

Differential Calculus: Limit, continuity and differentiability, differentiation of explicit and implicit function and parametric equations, significance of derivatives, differential co-efficient, successive differentiation of various types of functions. Leibnitz's theorem, Rolle's theorem, mean value theorem, Taylor's theorem in finite and infinite forms, Maclaurin's theorem in finite and infinite forms. Langrange's form of remainder's, Cauchy's form of remainder. Expansion of functions by differentiation, partial differentiation, Euler's theorem, tangent, normal, subtangent and subnormal in cartesian and polar coordinates, determination of maximum and minimum values of functions and Points of inflection, Applications, Evaluation of indeterminate forms by L. Hospital's rule, Curvature, center of curvature and chord of curvature, Evolute and involute, Asymptotes, Envelopes, Curve tracing.

Integral Calculus: Definitions of integration, Integration by method of substitution. Integration by parts, Standard integrals, Integration by the method of successive reduction. Definite integrals, its properties and use in summing series. Wallis's formulae. 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. Lengths of curves in

Cartesian and Polar co-ordinates, parametric and pedal equations. Intrinsic equation. Volumes of solids of revolution. Volume of hollow solids of revolution. Volume of hollow solids of revolution by shell method. Area of surface of revolution.

Ph – 1423 Physics – II

4 Hours/ week

4.00 Credits

Oscillations and Waves: Oscillations; The simple harmonic wave equation and its solution, Composition of simple harmonic motion- Lissajou's figures, Damped harmonic motion and its solution, Forced oscillation and resonance, *Wave motion*; Types of wave motion, Expression for plane progressive wave, Energy calculation of stationary and progressive wave, Interference of sound wave, Beats, Doppler effect.

Optics: Interference; Huygen's principle, Young's experiment, Coherent sources and its production methods, Analytical treatment of Interference, Interference from thin films, Newton's rings, *Diffraction*; Fresnel and Fraunhofer diffraction, Fraunhofer diffraction by single and double slit, Plane diffraction grating, Resolving and dispersive power of a grating, *Polarization*; Polarization by reflection, Refraction, Double refraction, Brewster's law and Malus law, Elliptical and circular polarization of light.

Structure of Solid: Crystal structure; Crystalline and amorphous solids, Different types of bonds in crystal and cohesive energy, Different types of crystal structure, Simple cubic, Body centered cubic and Face centered cubic crystal structure, Packing fraction, Miller indices and crystal plane. Defects in solids, Band theory of solids.

Modern Physics: Relativity; Postulates of special theory of Relativity, Galilean and Lorentz transformation equations, Length contraction, Time dilation, Twin paradox, Variation of mass with velocity, Einstein mass energy relation, *Particle properties of wave*; Quantum theory of light, Photoelectric effect, Compton effect, Pair production, Gravitational red shift. *Wave properties of particle*; Concept of de-Broglie wave, Phase velocity and group velocity, Heisenberg's Uncertainty principle and its application, *Atomic Structure*; Atom models, Electron orbits, Energy levels and spectral series of Hydrogen atom, Bohr's correspondence principle, *The LASER*,

Ph – 1424 Physics – II Sessional

3/2 Hours/ week

0.75 Credits

Sessional based on Physics – II (Ph – 1423)

Hum – 1427 English & Economics

3 Hours/ week

3.00 Credits

English: Sentence structure, Construction of paragraphs on scientific and other themes, Technical and Scientific vocabulary, Rules of syntax, Grammatical principles and structures, Comprehension, Correction of errors, Transformation of sentences, Phrases and Idioms, Prefixes and suffixes. Precis writing, Technical and official correspondence, Technical report writing, Research paper writing, Tender notice, Free composition.

Economics: Nature of the economics theory, applicability of economic theories to the problem of developing countries. Some basic concepts – supply, demand and their elasticity. The relationship among average, margin and total and their derivation. Equilibrium – stable, straight and dynamic equilibrium. Consumer's equilibrium-indifference curve, producer's equilibrium-isoquant. Production-factors of production, production possibility curve-equilibrium of a firm, fixed cost and variable cost, the short run and the long run. The cost curves and supply curves, law of returns, internal and external economics and diseconomics. Economics of development and planning, basic concept-saving, investment, GNP, NNP, per-capita income, growth rate, policy instruments of development. Fiscal policy, monetary policy and trade policy, their relative application in Bangladesh, some planning tools-capital output ration, input analysis, planning in Bangladesh-five year plans of Bangladesh, development problems related to agriculture, industry and population of Bangladesh.