Scheme and Syllabus
of
Bachelor of Technology
Computer Science & Engineering

4-YEAR PROGRAMME

Choice Based Credit System
with
Learning Outcomes based Curricular Framework
w.e.f. 2026-2027

Department of Computer Science & Engineering
Faculty of Engineering and Technology
Chaudhary Bansi Lal University
Prem Nagar, Bhiwani-127031

General course structure and credit distribution amongst various components of the curriculum

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
2 Hours Practical (P) per week	1 Credit

B. Range of Credits:

In the light of the fact that a typical Model Four-year Under Graduate degree program in Engineering has around 163 credits, the total number of credits proposed for the four-year B.Tech. Computer Science and Engineering shall be kept around 163.

C. Structure of UG Program in CSE:

The structure of UG program in Computer Science and Engineering shall have essentially the following categories of courses with the breakup of credits as given:

S. No.	Category	Breakup of Credits
1.	Humanities & Social Science Courses	
2.	Basic Science Courses	
3.	Engineering Science Courses	
4.	Program Core Courses (Branch specific)	
5.	Professional Elective Courses (Branch specific)	
6.	Open Elective Courses (from Humanities, Technical Emerging or other Subjects)	
7.	Project work, Seminar and Internship in Industry or elsewhere	
8.	Mandatory Courses [Induction Program, Environmental Sciences, Indian Constitution]	(non-credit)
	TOTAL CREDIT	**165***

**Minor variation is allowed as per need of the respective disciplines.*

D. Course code and definition:

Course code	Definitions
HSMC	Humanities & Social Science Mandatory Courses
BSC	Basic Science Courses
ESC	Engineering Science Courses
PC	Program Core Courses
PE	Program Elective Courses
OE	Open Elective Courses
MC	Mandatory Courses
EEC	Employment Enhancement Courses (Project/Summer Internship/Seminar, etc.)

E. Category-wise Courses

E.1 HUMANITIES & SOCIAL SCIENCES COURSES [HSMC]

(i) Number of Humanities & Social Science Courses: 01
(ii) Credits: 03

#	Course Code	Course Title	Hours per week		Credits
			Lecture	Practical	
1	*26HSMC201-T	Communication Skills	3	-	-
2				-	-
3					
4					
				Total Credits	03

E.2 BASIC SCIENCE COURSES [BSC]

(i) Number of Basic Sciences Courses: 07
(ii) Credits: 20

#	Course Code	Course Title	Hours per week		Credit
			Lecture	Practical	
1	26BSC101-T	Mathematics-I	4	-	4
2	26BSC102-T	Physics-I (Semiconductor Physics)	3	-	3
3	26BSC102-P	Physics-I (Semiconductor Physics) Lab	-	2	1
3	26BSC201-T	Mathematics-II	4	-	4
4	26BSC202-T	Chemistry-I	3	-	3
6	26BSC202-P	Chemistry-I Lab	-	2	1
7	26BSC301-T	Mathematics-III	4	-	4
			Total Credits		20

E.3 ENGINEERING SCIENCE COURSES [ESC]

(i) Number of Engineering Sciences Courses: 08
(ii) Credits: 21

#	Course Code	Course Title	Hours per week		Credits
			Lecture	Practical	
1	26ESC101-T	Computer Fundamentals	3	-	3
2	26ESC102-T	Basic of Electronics Engineering	3	-	3
3	26ESC102-P	Basic of Electronics Engineering Lab	-	2	1
4	26ESC103-T	Programming for Problem Solving using C	4	-	4
5	26ESC103-P	Programming for Problem Solving using C Lab	-	4	2
6	26ESC201-T	Python Programming	3	-	3
7	26ESC201-P	Python Programming Lab	-	4	2
8	26ESC202-T	Mathematical Foundation of Artificial Intelligence	3	-	3
				Total Credits	**21**

E.4 PROGRAM CORE COURSES [PC]

(i) Number of Program Core Courses:
(ii) Credits:

#	CourseCode	Course Title	Hours per week		Credits
			Lecture	Practical	
1	26PC101-T	Introduction of Artificial Intelligence	4	-	4
2	26PC201-T	Database Concepts	3	-	3
3	26PC201-P	Database Concepts Lab (SQL)	-	4	2
4					
5					
6					
7					
				Total Credit	

E.5 PROGRAM ELECTIVE COURSES [PE]

(i) Number of Program Elective Courses:
(ii) Credits:

#	Course Code	Course Title	Hours per week		Total Credits
			Lecture	Practical	
1					
2					

E.6 OPEN ELECTIVE COURSES [OE]

(i) Number of Open Elective Courses:
(ii) Credits:

#	Course Code	Course Title	Hours per week		Total Credits
			Lecture	Practical	
1					
2					
				Total Credits	

E.7 EMPLOYABILITY ENHANCEMENT COURSES (EEC) PROJECT WORK, SEMINAR AND INTERNSHIP IN INDUSTRY OR ELSEWHERE

#	Course Code	Course Title	Hours per week		Total Credits
			Lecture	Practical	
1					
2					
				Total Credits	

E.8 MANDATORY COURSES [MC]

#	Course Code	Course Title	Hours per week		Total Credits
			Lecture	Practical	
1	26MC101-T	Environmental Sciences	3	-	3
2	*26MC102	Induction Training (As per AICTE Guidelines)	-	-	-
3	26MC201-T	Indian Constitution	3	-	-
				Total Credits	-

Note: These are mandatory non-CGPA courses.

*The Essence and Details of Induction program can also be understood from the 'DetailedGuide on Student Induction program', as available on AICTE Portal, (Link:https://www.aicteindia.org/sites/default/files/Detailed%20Guide%20on%20Student%20Induction%20program.pdf).

Induction program (mandatory)	Three-week duration
Induction program for students to be offered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch & Innovations

F. Mandatory Visits/ Workshop/Expert Lectures:

a. It is mandatory to arrange one industrial visit every semester for the students ofeach branch.

b. It is mandatory to conduct a One-week workshop during the winter break afterfifth semester on professional/ industry/ entrepreneurial orientation.

c. It is mandatory to organize at least one expert lecture per semester for eachbranch by inviting resource persons from domain specific industry.

G. Evaluation Scheme:

a. **For Theory Courses:**
(The total marks will be 100 in which the weightage of internal assessment is 30% and for End Semester Exam is 70%)

b. **For Practical Courses:**
(The total marks will be 50 in which weightage of internal assessment is 25% and for End Semester Exam is 25%)

c. **For Summer Internship / Projects / Seminar etc.**
Evaluation is based on work done, quality of report, performance in viva-voce, presentation etc.

H. Mapping of Marks to Grades

Absolute marks will be mapped to grades as per University ordinances.

B.Tech. (CSE) 1st Semester

Total Credits: 28 **Maximum Marks- 800**

Sr. No.	Category	Course Code	Course Title	Hours per Week			Course Credits			Marks			
										Theory		Practical /Field Survey	
				L	T	P	Th	P	Total	External	Internal	External	Internal
1	Basic Science Course	26BSC101-T	Mathematics-I	3	1	0	4	0	4	70	30	--	--
2	Basic Science Course	26BSC102-T	Physics-I (Semiconductor Physics)	3	0	0	3	0	3	70	30	--	--
3		26BSC102-P	Physics-I (Semiconductor Physics) Lab	0	0	2	0	1	1	--	--	25	25
4	Engineering Science Course	26ESC101-T	Computer Fundamentals	3	0	0	3	0	3	70	30	--	--
5	Engineering Science Course	26ESC102-T	Basic of Electronics Engineering	3	0	0	3	0	3	70	30	--	--
6		26ESC102-P	Basic of Electronics Engineering Lab	0	0	2	0	1	1	--	--	25	25
7	Engineering Science Course	26ESC103-T	Programming for Problem Solving using C	3	1	0	4	0	4	70	30	--	--
8		26ESC103-P	Programming for Problem Solving using C Lab	0	0	4	0	2	2	--	--	25	25
9	Program Core Course	26PC101-T	Introduction of Artificial Intelligence	3	1	0	4	0	4	70	30	--	--
10	Mandatory Course	26MC101-T	Environmental Sciences	2	1	0	3	0	3	--	--	--	50
11	Mandatory Course	*26MC102	Induction Training (As per AICTE Guidelines)	0	0	0	0	0	0	--	--	--	--
12	Bridge Course	*26BMTH-101	Mathematics (Bridge Course)**	2	1	0	3	0	3	35	15	--	--
Total				23	4	8	21	4	28/31**	420	180	75	125

***Non-CGPA Paper and Non-University Examination**

**** Applicable for students not studied Mathematics in Senior Secondary Level**

Semester-I						
Name of the Course	Mathematics-I				Course Code	26BSC101-T
Scheme and Credits	L	T	P	Credits	Category	Basic Science Course
	3	1	0	4		
Maximum Marks	External: 70 Marks (Theory) Internal: 30 Marks (20 Marks of Minor Test, 05 Marks of Assignment and 05 Marks of Attendance)				Time of Examination	3 Hours

Note:
The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of seven short answer type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives:
1. To help students comprehend and use the mathematical skills from linear algebra and calculus that are necessary to solve engineering problems.
2. To acquaint students with fundamental calculus ideas like curvature, special functions, Taylor and Maclaurin series, and mean value theorems.
3. To provide students a solid grasp of matrix algebra so they can manage systems of linear equations.
4. To evaluate linear transformations and their matrix representations by comprehending the structure of vector spaces, subspaces, base, and dimension.
5. To acquaint pupils with ideas like inner product spaces, eigenvectors, and eigenvalues.

Course Outcomes (CO):
After completion of course, students would be able to:
1. Describe the terms and ideas used in calculus and linear algebra, such as curvature, matrices, rank of matrix, normal form, vector spaces, linear transformation, inner product spaces, eigenvalues, eigenvectors, etc.
2. Understand the significance and contribution of various theorems and methods such as Rolle's Theorem, Lagrange's mean value Theorem, Cauchy's mean value theorem, Taylor's and Maclaurin's Theorems, Gauss elimination method, Rank Nullity Theorem, Gram-Schmidt orthogonalization process, etc.
3. Apply the ideas of differential and integral calculus to notions of evolutes, maxima, minima, volume and surface area of solid of revolution.
4. Examine and assess the linear equation system's solution.
5. Analyse matrix eigenvalues, eigenvectors, basis, vector space dimensions, and inner product spaces.

Unit-I

Calculus: Indeterminate forms and L' Hospital's rule, Maxima and Minima of single variable function, Rolle's Theorem, Lagrange's mean value Theorem, Cauchy's mean value Theorem, Taylor's and Maclaurin's Theorems with remainder, Taylor and Maclaurin series, Curvature, Evolutes and Involutes, Beta and Gamma functions and their properties, Applications of definite integrals to evaluate surface areas and volumes of solid of revolutions.

Unit-II

Matrices: Matrices, Vectors: addition and scalar multiplication, Matrix multiplication, Determinants, Elementary transformations, Inverse of a matrix, Rank of a matrix, Normal form, Echelon form, Linear systems of equations, Linear Independence, Cramer's Rule, Gauss elimination and Gauss-Jordan elimination

Unit-III

Vector spaces I: Vector Space, Subspaces, Linear span of set, Linear dependence of vectors, Basis, Dimension, Linear transformations (maps), Range and kernel of a linear map, Rank and nullity, Inverse of a linear transformation, Rank nullity Theorem, Matrix associated with a linear map, Composition of linear maps.

Unit-IV
Vector spaces II: Eigenvalues, Eigenvectors, Symmetric, Skew-symmetric and Orthogonal Matrices, Eigen bases, Diagonalization, Inner product spaces, Orthogonal set, Orthogonal complement, Orthonormal set of vectors, Gram-Schmidt orthogonalization.

Text/Reference Books:

1. Reena Garg, AICTE's Prescribed Textbook: Mathematics-I (Calculus and Linear Algebra), Khanna Book Publishing Co.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson Education.
3. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley &Sons.
4. D. Poole, Linear Algebra: A Modern Introduction, Brooks Cole.
5. Ramana B.V., Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Limited.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
8. V. Krishnamurthy, V.P. Mainra and J. L. Arora, An introduction to Linear Algebra, Affiliated East–West Press Private limited.

<table>
<tr><td colspan="6">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="4">Physics-I (Semiconductor Physics)</td><td>Course Code</td><td>26BSC102-T</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Basic Science Course</td></tr>
<tr><td>3</td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>Maximum Marks</td><td colspan="4">External: 70 Marks (Theory)
Internal: 30 Marks (20 Marks of Minor Test, 05 Marks of Assignment and 05 Marks of Attendance)</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="6">Note:
The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of seven short answer type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.</td></tr>
<tr><td colspan="6">Course Objectives:
1. To impart understanding of the foundations of quantum physics and the limitations of classical mechanics.
2. To instruct students on the genesis of energy bands in various electrical materials and solids.
3. To present semiconducting devices to the pupils.
4. To gain a fundamental understanding of lasers and optical fibers and how they are used in medical, optoelectronic, and communication applications.</td></tr>
<tr><td colspan="6">Course Outcomes (CO):
After completion of course, students would be able to:
1. To examine how classical and quantum mechanical phenomena vary from one another. will understand the basic equation of motion in quantum mechanics as well as the dual nature of matter.
2. Analyze the distinctions between various electrical material kinds and comprehend the source of energy bands in solids.
3. Gain an understanding of semiconducting material physics and applications. understanding of how charge carriers move thru semiconductors and optoelectronic devices.
4. Recognize population inversion, optical pumping, spontaneous and triggered radiation emission, and three- and four-level lasers. Details of the ruby, He-Ne laser and its uses.</td></tr>
<tr><td colspan="6">Unit-I
Introduction to Quantum Mechanics: Limitations of classical mechanics, Black body radiation phenomenon and Planck's radiation law, Photoelectric effect, Compton effect, Wave-particle duality, de- Broglie's hypothesis, Uncertainty principle, time-dependent and time-independent Schrodinger wave equation, Physical significance of Wave function ψ, Particle in a 1-D box problem.</td></tr>
<tr><td colspan="6">Unit-II
Electronic Materials: Free electron theory, Drude model, Kronig-Penny model (to introduce origin of band gap), Energy bands in solids, E-k diagram, Direct and indirect band gaps, types of electronic materials: metals, semiconductors and insulators, Density of states, Occupation probability, Fermi level, Effective mass, Phonons.</td></tr>
<tr><td colspan="6">Unit-III
Semiconductors: Intrinsic and extrinsic semiconductors, dependence of Fermi level on carrier-concentration and temperature, carrier transport: diffusion and drift, p-n junction, heterojunctions (Qualitative), metal-semiconductor junction (Ohmic and Schottky), photoconductivity and photovoltaic effect, optoelectronics devices like photoconductive cell, photodiode, Solar cell and LED.</td></tr>
<tr><td colspan="6">Unit-IV
Lasers: Einstein's theory of matter radiation interaction: absorption, spontaneous and stimulated emission of radiation, relation between A and B coefficients, population inversion, pumping, two,</td></tr>
</table>

three and four level laser systems, characteristics of laser beam, different types of lasers: gas laser (He-Ne), solid-state laser (Ruby), semiconductor laser, applications of lasers.
Text/Reference Books: 1. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw HillInc. (1995). 2. B.E.A.Salehand M.C.Teich, Fundamentals of Photonics, John Wiley & Sons, Inc., (2007). 3. S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley (2008). 4. A.Yarivand P.Yeh, Photonics: Optical Electronics in Modern Communications, Oxford University Press, New York(2007). 5. P. Bhattacharya, Semiconductor Optoelectronic Devices, Prentice Hall of India (1997). 6. Online course: "Semiconductor Optoelectronics" by M R Shenoy on NPTEL. 7. Online course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Gupta on NPTEL

<table>
<tr><td colspan="6">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="3">Physics-I
(Semiconductor Physics) Lab</td><td>Course Code</td><td>26BSC102-P</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Basic Science Course</td></tr>
<tr><td>0</td><td>0</td><td>2</td><td>1</td></tr>
<tr><td>Maximum Marks</td><td colspan="3">External: 25 Marks
Internal: 25 Marks</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="6">Course Objectives:
1. To impart practical understanding of the foundations of quantum physics and the limitations of classical mechanics.
2. To instruct students on the genesis of energy bands in various electrical materials and solids thorough practical.
3. To gain a practical understanding of lasers and optical fibers and how they are used in medical, optoelectronic, and communication applications.</td></tr>
<tr><td colspan="6">Course Outcomes (CO):
After completion of course, students would be able to:
1. Students will get hands-on experience organizing and carrying out physics experiments. This involves using and managing a variety of tools and equipment used in laboratories.
2. Gain an understanding of measurement errors and learn how to analyze them.
3. Link the concepts of theoretical physics to real-world applications and useful experiments.
4. Students will be able to measure accurately, analyze data from experiments, and interpret findings to make insightful deductions.</td></tr>
<tr><td colspan="6">Unit-I
1. To determine the least count of the vernier caliper and measure the thickness of any object using it.
2. To determine the least count of screw gauge and measure the diameter of the wire.
3. To measure the least count of the Spherometer and calculate the radius of curvature of a convex surface using it.
4. To test and do measurements on various electronic devices using a multimeter.
5. To study the Hall effect in semiconductors and measure the Hall coefficient.
6. To find the frequency of the AC mains using a sonometer.
7. To study the magnetic properties of materials using the B-H curve.
8. To study the Curie temperature of materials using the Dielectric set-up.
9. To verify the inverse square law with the help of a photovoltaic cell.
10. To determine Planck's constant using a photocell.
11. To study the characteristics of a Solar cell and find out the fill factor.
12. To measure the e/m of an electron using the helical method.
13. To find the temperature coefficient of platinum using the Griffith bridge.
14. To study the forward and reverse characteristics of the P-N junction diode.
15. To study the reverse characteristics of the Zener diode and voltage regulation using the Zener Diode
16. To determine the unknown resistance using a Post office box.
17. To study the variation of the magnetic field along the axis of a circular coil carrying current.
18. To determine the unknown capacitance using flashing and quenching of Ne/Ar bulb.
19. To compare the capacitance of two capacitors using De Sauty's Bridge.

Note: Students have to perform at least eight experiments in total. More experiments may be added from time to time as per requirement.</td></tr>
<tr><td colspan="6">Text/Reference Books:
1. Advanced Practical Physics for students, B. L. Flint and H. T. Workshop, 1971, Asia Publishing House.
2. Engineering Practical Physics, S. Panigrahi and B. Mallick, 2015, Cengage Learning</td></tr>
</table>

India Pvt. Ltd.
3. Practical Physics, G. L. Squires, 2015, 4/e, Cambridge University Press.
4. A Text Book of Practical Physics, Vol I, Prakash and Ramakrishna, 11/e, 2011, Kitab Mahal.

Semester-I						
Name of the Course	Computer Fundamentals				Course Code	26ESC101-T
Scheme and Credits	L	T	P	Credits	Category	Engineering Science Course
	3	0	0	3		
Maximum Marks	External: 70 Marks (Theory) Internal: 30 Marks (20 Marks of Minor Test, 05 Marks of Assignment and 05 Marks of Attendance)				Time of Examination	3 Hours

Note:
The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of seven short answer type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.

Course Objectives: The objective of the course is to give basic competencies for application of a computer to everyday tasks using standard packages.

Course Outcomes (CO):
After completion of course, students would be able to:

1. Describe how a computer processor is structured and functions.
2. Recognize the role of computer specifications, peripherals, and primary and secondary memory.
3. Describe how information and data are represented in computer systems.
4. Examine how ordinary Word, spreadsheets, graphic design software, and database systems are used.

Unit-I

Definition, characteristics of computers, application of computers, evolution of computers.
Block diagram of computer, its components and their functions, Types of computer based on different criteria like processing power, hardware generation and functions.

Unit-II

Non positional number system, positional number system, number system conversion, fractional number. Binary Arithmetic: Addition, Subtraction, Multiplication, Division.
Boolean Algebra and Logic Circuits: Boolean Algebra, Boolean Function. Logic Gates, Logic Circuits, Minimization of Boolean expressions.
Computer Codes: BCD Code, EBCDIC code, ASCII, Collating Sequence.

Unit-III

Secondary Storage Devices: Sequential and Direct Access Devices, Punched Paper Tape, Magnetic Tape, Magnetic Disk, Floppy Disk, Winchester Disk, Magnetic Drum, Mass Storage, Optical Disk, Magnetic Bubble Memory, Storage Hierarchy.
Input-Output Devices: Punched Hole Devices, Magnetic media devices, printers, keyboard devices, Scanners, Other devices, Offline Data Entry Devices.

Unit-IV

Computer languages and computer software: Levels/generations of computer languages and their advantages and disadvantages, types of computer languages and their application areas/domains, software and its types, software packages.

Text/Reference Books:

1. Priti Sinha, Pradeep K., Sinha, "Computer Fundamentals: Concepts, Systems & Applications", BPB Publications.
2. V. Rajaraman, "Fundamentals of Computers", PHI.
3. V. Rajaraman, "Introduction to Information Technology", PHI
4. R.K. Taxali, "Introduction to Software Packages", Galgotia Publications.

<table>
<tr><td colspan="6">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="4">Basic of Electronics Engineering</td><td>Course Code</td><td>26ESC102-T</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Engineering Science Course</td></tr>
<tr><td>3</td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>Maximum Marks</td><td colspan="4">External: 70 Marks (Theory)
Internal: 30 Marks (20 Marks of Minor Test, 05 Marks of Assignment and 05 Marks of Attendance)</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="6">Note:
The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of seven short answer type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.</td></tr>
<tr><td colspan="6">Course Objectives: To introduce the basic concepts of electrical and electronics engineering.</td></tr>
<tr><td colspan="6">Course Outcomes (CO):
After completion of course, students would be able to:
1. Use a variety of network theorems and principles to solve DC circuits.
2. Calculate various ac values using phasor representations of electric circuits, compute Boolean expressions, and use logic gates for implementation.
3. Recognize the design, operation, and uses of electrical machines, diodes, and transistors.
4. Recognize the basic ideas and methods of digital electronics.</td></tr>
<tr><td colspan="6">Unit-I
Semiconductor Physics: Basic concepts, Intrinsic and extrinsic semiconductors, diffusion and drift currents, p-n junction under open-circuit, reverse bias and forward-bias conditions, p-n junction in the breakdown region, Ideal diode, terminal characteristics of junction diode.
Amplifiers: Introduction of different types of amplifiers and their characteristics, Principle of amplification, Frequency response of RC coupled amplifiers, amplifier bandwidth and Concept of Cascaded Amplifiers, Feedback amplifiers, Effect of positive and negative feedback on amplifier gain and bandwidth.</td></tr>
<tr><td colspan="6">Unit-II
Oscillators: Criteria for oscillations, Qualitative analysis of LC, RC and Crystal Oscillators, Study of Wein Bridge Oscillators; Operational Amplifiers: Op-amps, its characteristics and its applications.
Power Suppliers: Introduction and Working of Switched Mode Power Supply (SMPS), Voltage Regulator, Introduction to Inverters and UPS.</td></tr>
<tr><td colspan="6">Unit-III
Digital Electronics: Binary, Octal and Hexadecimal number systems and conversions, Boolean Algebra, Truth tables of logic gates (AND, OR, NOT), NAND, NOR as universal gates, Difference between combinational circuits and sequential circuits, Introduction to flip-flops (S-R & J-K).
Electronics Instruments: Role, importance and applications of general-purpose test instruments viz Multimeter Digital & Analog, Cathode Ray Oscilloscope (CRO), Function/Signal Generator.</td></tr>
<tr><td colspan="6">Unit-IV
Displays: Seven segment display, Fourteen segment display, Dot matrix display
LED Display: Introduction, Construction, Advantage of LEDs in electronics display
LCD Display: Introduction; Types of LCD display:- Dynamic scattering and field effect type; Types of liquid crystal cells :- Transmitting type and reflective type; Advantage & disadvantage of LCD display common applications.</td></tr>
<tr><td colspan="6">Text/Reference Books:
1. B.L Theraja, "Electrical Technology-1", S Chand.
2. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
3. Boylestad, R.L. and Nashelsky, L., Electronic Devices & Circuit Theory, Perason (2009).</td></tr>
</table>

4. Mano M. M. and Ciletti, M.D., Digital Design, Pearson, Prentice Hall, (2013).
5. Tocci R J and Widmer N S, "Digital Systems – Principles and Applications", 8th Ed., Pearson Education India, New Delhi (2001).

SEMESTER-I						
Name of the Course	Basic of Electronics Engineering Lab				Course Code	26ESC102-P
Scheme and Credits	L	T	P	Credits	Category	Engineering Science Course
	0	0	2	1		
Maximum Marks	External: 25 Marks Internal: 25 Marks				Time of Examination	3 Hours

Course Objectives: To introduce the basic concepts of electrical and electronics engineering.

Course Outcomes (CO):

After completion of course, students would be able to:

1. Learn about typical electrical and electronic parts and their ratings.
2. Use cables with the proper ratings to make electrical connections.
3. Recognize how typical electrical and electronic measurement devices are used.
4. Recognize the fundamental properties of transformers, electrical devices, diodes, and BJTs.

LIST OF EXPERIMENTS: -

1. Basic safety precautions. Introduction and use of measuring instruments–voltmeter, ammeter, multi-meter, oscilloscope. Practical resistors, capacitors and inductors.
2. To verify KCL and KVL.
3. To verify Thevenin's and Norton theorems.
4. To verify Superposition theorems.
5. To perform O.C. and S.C. tests of a transformer.
6. Measuring the response of R-L, R-C, and R-L-C circuits to a step change in voltage. Sinusoidal steady state response of R-L, and R-C circuits – impedance calculation and verification.
7. Observation of phase differences between current and voltage.
8. Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor)
9. To verify the truth table of basic gates.
10. To verify truth table of universal gates.
11. To verify the truth table of boolean expression using basic gates
12. To implement the basic gates using transistor
13. To verify diode characteristics.
14. To verify BJT Common Emitter characteristics.
15. To verify BJT Common base characteristics.
16. To study the MOSFET characteristics
17. To plot and study the input and output characteristics of BJT in common-emitter configuration
18. To find frequency response of a given amplifier and calculate its bandwidth
19. To assemble and test 5V/9 V DC regulated power supply and find its line-regulation and loand-regulation

Note: At least 10 experiments are to be performed by the students.

Text/Reference Books:

1. B.L Theraja, "Electrical Technology-1", S Chand.
2. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
3. Boylestad, R.L. and Nashelsky, L., Electronic Devices & Circuit Theory, Perason (2009).
4. Mano M. M. and Ciletti, M.D., Digital Design, Pearson, Prentice Hall, (2013).

<table>
<tr><td colspan="6">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="3">Programming for Problem Solving using C</td><td>Course Code</td><td>26ESC103-T</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Engineering Science Course</td></tr>
<tr><td>3</td><td>1</td><td>0</td><td>4</td></tr>
<tr><td>Maximum Marks</td><td colspan="3">External: 70 Marks (Theory)
Internal: 30 Marks (20 Marks of Minor Test, 05 Marks of Assignment and 05 Marks of Attendance)</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="6">Note:
The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of seven short answer type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.</td></tr>
<tr><td colspan="6">Course Objectives: This course develops basic knowledge of computers and programming, enhances problem-solving skills, and enables students to design simple solutions using C language and modern tools while encouraging continuous learning.</td></tr>
<tr><td colspan="6">Course Outcomes (CO):
After completion of course, students would be able to:
1. Explain the fundamental parts, operations, categories, and restrictions of computers, including number systems and memory structure.
2. To answer basic logical and numerical problems, use structured problem-solving methods including algorithms, flowcharts, and pseudo-codes.
3. Create C programs that address real-world issues by utilizing basic programming features including control statements, arrays, strings, functions, and recursion.
4. To write effective programs, use sophisticated programming ideas like pointers, structures, unions, file handling, and dynamic memory management in C.</td></tr>
<tr><td colspan="6">Unit-I
Introduction to Programming; Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart, Pseudocode with examples. From algorithms to programs; source code, memory locations, Syntax and Logical Errors in compilation, object and executable code, Language translator, Interpreter, Assembler, Compiler, Compiling and executing process.</td></tr>
<tr><td colspan="6">Unit-II
Fundamentals of C Language: characters set, Whitespace characters or escape sequences, Format specifiers, Tokens in C, Keywords, Variables, Constant, Identifiers, Special symbols, Header files, Data types, Type casting, Operators and Expressions, Precedence and associativity of operators in C.

Decision-making Statements: Conditional and Unconditional decision-making statements, Roots of a quadratic equation, Loops, Arrays, 1-D arrays, Multidimensional array, String, Standard inbuilt string functions.</td></tr>
<tr><td colspan="6">Unit-III
Searching- Linear Search and Binary Search, Sorting Algorithms- Bubble Sort.
Function- Need of the function, Types of function, Call by value, Call by reference, The Console Input-output Functions, Preprocessor, Storage classes in C, Recursion, use recursion for finding the factorial of a number, Fibonacci series, Ackermann function.</td></tr>
<tr><td colspan="6">Unit-IV
Structures, defining structures and Array of Structures, Passing structure in a function, Union.
Pointers, Idea of pointers, Defining pointers, Use of Pointers in self-referential structures. Pointer Arithmetic.</td></tr>
</table>

File Handling in C, Operations on file through the inbuilt functions, Dynamic memory allocate: malloc(), calloc(), free(). Realloc(), Basic of Time and Space Complexity of an algorithm.
Text/Reference Books: 1. Yashavant Kanetkar, Let Us C, BPB Publication. 2. Dr. Kamaldeep, Programming for Problem-solving with C, BPB Publication. 3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill. 4. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill. 5. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.

<table>
<tr><td colspan="6">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="3">Programming for Problem Solving using C Lab</td><td>Course Code</td><td>26ESC103-P</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Engineering Science Course</td></tr>
<tr><td>0</td><td>0</td><td>4</td><td>2</td></tr>
<tr><td>Maximum Marks</td><td colspan="3">External: 25 Marks
Internal: 25 Marks</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="6">Course Objectives:
This laboratory course in C language will enable students to tackle basic computational issues by applying their basic programming skills in this lab course. It boosts knowledge of computer systems and memory management, improves problem-solving skills, encourages the actual application of programming tools and techniques, and cultivates cooperation, communication, and a continuous learning attitude.</td></tr>
<tr><td colspan="6">Course Outcomes (CO):
After completion of course, students would be able to:
1. Recognize and exhibit knowledge of programming environments, computer components, and the fundamental grammar of the C language.
2. Use operators, loops, arrays, strings, and functions—basic programming concepts—to resolve simple computational issues.
3. Use sophisticated C programming tools like pointers, structures, file handling, and dynamic memory management to create and implement modular solutions.
4. Use recursive, conditional, and iterative logic to analyze and build well-structured programs to solve computational problems in real time.</td></tr>
<tr><td colspan="6">LIST OF EXPERIMENTS-
1. To formulate simple algorithms for arithmetic and logical problems.
2. Familiarization with programming environment
3. Simple computational problems using operators
4. Problems involving loops and conditional statements
5. Roots of a quadratic equation
6. Iterative problems e.g., sum of series
7. 1D and Multi-D Array manipulation
8. Matrix problems, String operations
9. Simple functions and Recursive problems
10. Pointers and structures
11. File operations
12. File handling in C, Operations on file through the inbuilt functions,
13. Dynamic memory allocate: malloc(), calloc(), free(). Realloc()

Note: At least 10 experiments are to be performed by the students</td></tr>
<tr><td colspan="6">Text/Reference Books:
1. Yashavant Kanetkar, Let Us C, BPB Publication.
2. Dr. Kamaldeep, Programming for Problem-solving with C, BPB Publication.
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
4. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
5. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.</td></tr>
</table>

<table>
<tr><td colspan="6">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="4">Introduction of Artificial Intelligence</td><td>Course Code</td><td>26PC101-T</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Program Core Course</td></tr>
<tr><td>3</td><td>1</td><td>0</td><td>4</td></tr>
<tr><td>Maximum Marks</td><td colspan="4">External: 70 Marks (Theory)
Internal: 30 Marks (20 Marks of Minor Test, 05 Marks of Assignment and 05 Marks of Attendance)</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="6">Note:
The Final-Term examination shall cover the whole content of the course. The total number of questions shall be nine. Question number one will be compulsory and will be consisting of seven short answer type questions from the complete syllabus. In addition to the compulsory first question, there shall be four units in the question paper each consisting of two questions. The student will attempt one question from each unit in addition to the compulsory question. All questions will carry equal marks.</td></tr>
<tr><td colspan="6">Course Objectives:
The course covers a wide variety of approaches, including Supervised Learning, Neural Nets and Deep Learning, Reinforcement Learning, Expert Systems, Bayesian Learning, Fuzzy Rules, and Genetic Algorithms.</td></tr>
<tr><td colspan="6">Course Outcomes (CO):
After completion of course, students would be able to:
1. Gain an understanding of artificial intelligence.
2. Learn about knowledge-based AI techniques and systems.
3. Use the probabilistic approach to AI and recognize NLP and neural networks while creating AI models.
4. Understand machine learning ideas and its deterministic tools.</td></tr>
<tr><td colspan="6">Unit-I
History of artificial intelligence, The birth of artificial intelligence, AI Winters, Todays' AI, Historical milestones in the development of AI, Great contributors, People who have influenced AI , Differences between strong AI and weak AI, Artificial Intelligence definitions, Emergence of AI – Technological advances.</td></tr>
<tr><td colspan="6">Unit-II
Functions of AI, Characteristics of artificial intelligence, Applications of AI, AI in health care, Industry 4.0, AI in manufacturing, AI in education sector, AI in business, AI in Finance Sector, AI in Law, AI in society, Cognitive science and AI, Cognition and process of Cognition, Disciplines in Cognitive science, Multidisciplinary subject, Linguistics, Artificial intelligence as Cognitive science, Methods in Cognitive science, Watson.</td></tr>
<tr><td colspan="6">Unit-III
Introduction to knowledge representation systems, Knowledge representation using logic, Propositional logic, Semantics of propositional logic, Properties of propositional logic statements, Tautologies and logical implication, Resolution, Conjunctive normal form, Resolution is valid, Resolution algorithm, Knowledgebase systems, Structure of a knowledge based system, Recap of artificial intelligence.</td></tr>
<tr><td colspan="6">Unit-IV
Components of expert systems, Expert systems development, Wumpus world, Logic, A simple knowledge base, Exploring the Wumpus world, Semantic net, Inference in semantic networks, Semantic networks: Types and components, Types of relationships in semantic network, Frames, Frames: Some examples, Non-monotonic logic, Circumscription, Default logic, Artificial Neural Network, Natural language processing, Classical NLP.</td></tr>
<tr><td colspan="6">Text/Reference Books:
1. Gersting, J. L. Mathematical Structures for Computer Science. 7th edition, Computer Science Press, New York, 2020.</td></tr>
</table>

2. Markiewicz, M. and Zheng, J. Getting Started with Artificial Intelligence: A Practical Guide to Building Enterprise. Ist edition, Shroff/O'Reilly, 2019.
3. Theobald, O. Machine Learning: Make Your Own Recommender System. Scatterplot Press, 2018.
4. Flasinski, M. Introduction to Artificial Intelligence. Springer, 2017.

<table>
<tr><th colspan="7">Semester-I</th></tr>
<tr><td>Name of the Course</td><td colspan="4">Environmental Sciences</td><td>Course Code</td><td>26MC101-T</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Mandatory Course</td></tr>
<tr><td>2</td><td>1</td><td>0</td><td>3</td></tr>
<tr><td>Maximum Marks</td><td colspan="4">Internal: 50 Marks (Practical)</td><td>Time of Examination</td><td>3 Hours</td></tr>
<tr><td colspan="7">Course Objectives: The objectives of this course is to study the concept of environmental studies, sustainable development and ecosystem.</td></tr>
<tr><td colspan="7">Course Outcomes (CO):
After completion of course, students would be able to:
1. Understand the concept of environmental studies, sustainable development and ecosystem.
2. Learn about the various natural resources and about biodiversity and its conservation.
3. Know about the types of pollution, solid waste management, global environmental issues and environmental laws.
4. Understand the concept of population growth and its impacts on environment and disaster management.</td></tr>
<tr><td colspan="7">Unit-I
Introduction to Environmental Sciences- Multidisciplinary nature of environmental science; Scope and importance; Concept of sustainability and sustainable development. Ecosystems: Definition, structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs, Major ecosystems types: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystem (lakes, rivers, oceans).</td></tr>
<tr><td colspan="7">Unit-II
Natural resources: Renewable and Non-Renewable Resources: Land resources: Land degradation and soil erosion. Forest resources: Importance of forests, deforestation: causes and impacts on environment. Water resources: Use and over-exploitation of surface and ground water. Energy resources: Renewable and non- renewable energy sources.
Biodiversity and Conservation: Definition and its types, Endangered and endemic species of India. Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation biodiversity: In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and informational values.</td></tr>
<tr><td colspan="7">Unit-III
Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution.
Solid waste management: Sources, methods of disposal: Landfill, incineration and composting, Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.
Environmental Policies & Practices: Environmental laws, Environment (Protection) Act, 1986, Air (Prevention & Control of Pollution) Act, 1981, Water (Prevention and control of Pollution) Act, 1974.</td></tr>
<tr><td colspan="7">Unit-IV
Human Communities and the Environment: Human population growth, Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected person.
Disaster management: floods, earthquake, cyclones, landslides and drought.
Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

Note- Students must complete a mandatory field survey to document local environmental assets or issues.
Common Survey Assignments • Ecosystem Documentation: Visit a local area to document river, forest, grassland, or hill features.
* Pollution Assessment: Study polluted sites like urban waste dumps, industrial zones, or contaminated water bodies.
* Biodiversity Logging: Identify and document local flora and fauna species in a specific habitat.</td></tr>
</table>

* Socio-Environmental Studies: Conduct surveys on public health, water scarcity, or civic waste habits.

Fieldwork Deliverables • Field notes taken during site visits.
* Photographic or video evidence of the location.
* Data tables compiling observations.
* Preliminary analysis of environmental threats.

The project and field survey components are typically evaluated out of a set internal score
1. Project Report Structure (Marks: 30)
* Introduction: Clear definition of the chosen environmental topic or problem.
* Methodology: Tools, survey questionnaires, or scientific tests used to gather data.
* Data Analysis: Interpretation of results using charts, graphs, and statistics.
* Conclusion: Feasible solutions, mitigation plans, and personal learnings.

2. Viva-Voce / Oral Examination (Marks: 20)
* Viva conducted by an internal or external subject examiner.
* Evaluation of the student's understanding of their chosen project.
* Ability to defend findings and propose solutions.

Text/Reference Books:

1. Kaushik, A & Kaushik, C.P. 2022. Perspectives in Environmental Studies. New Age International Pvt. Ltd, New Delhi.
2. Bharucha, E. 2021. A Textbook of Environmental Studies for Undergraduate Courses, Orient Blackswan Pvt Ltd.
3. Goswami, P., Mandal, J. & Singh, S. 2022. A Textbook on Environmental Studies, Ashok book stall, Assam.
4. Joshi, P.C. & Joshi, N. 2009. A Text Book of Environmental Science. APH Publishing Corporation. Basu, Press.
5. M. & Xavier Savarimuthu, S.J. 2017. Fundamentals of Environmental Studies. Cambridge University.
6. Singh, R.P. & Islam, Z. 2012. Environmental Studies. Concept Publishing Company.

<table>
<tr><td colspan="7">Semester-I</td></tr>
<tr><td>Name of the Course</td><td colspan="4">Mathematics (Bridge Course)</td><td>Course Code</td><td>26BMTH-101</td></tr>
<tr><td rowspan="2">Scheme and Credits</td><td>L</td><td>T</td><td>P</td><td>Credits</td><td rowspan="2">Category</td><td rowspan="2">Bridge Course (Applicable for students not studied Mathematics in Senior Secondary Level)</td></tr>
<tr><td>2</td><td>1</td><td>0</td><td>3
Non-CGPA Paper and Non-University Examination</td></tr>
<tr><td>Maximum Marks</td><td colspan="4">External: 35 Marks
Internal: 15 Marks</td><td>Time of Examination</td><td>1.5 Hours</td></tr>
<tr><td colspan="7">Note:
The question paper will consist of two parts. Part-A will have two long-answer type questions of 10 marks each, and student are required to attempt one question from Part-A. Part-B will have seven short-answer type questions of 5 marks each and students are required to attempt any five questions from Part-B. Thus, the examination will carry a total of 35 marks.</td></tr>
<tr><td colspan="7">Course Objectives:
1. To understand the concepts of Sets, Relations and Functions.
2. To understand the solution of differential equations.
3. To understand the concepts of matrices.
4. To understand the concept of vectors, Probability and Statistics.</td></tr>
<tr><td colspan="7">Course Outcomes (CO):
After completion of course, students would be able to:
1. Ability to understand and apply the use of Sets, Relations and Functions.
2. Ability to understand and apply the ordinary differential equations.
3. Ability to use matrices to solve system of linear equations.
4. Ability to apply the concepts of measure of Dispersion.</td></tr>
<tr><td colspan="7">Unit-I
Set Theory: Definition and representation, types of sets- Subsets, proper subsets, power set and universal set, Operations on sets: union, intersection, difference, symmetric difference and complement, Venn diagrams, partition of a set and principle of inclusion–exclusion, Cartesian product.
Relations: Definition, Domain and range of a relation,
Types of relations: reflexive, reflexive, symmetric, asymmetric, antisymmetric and transitive, Partial order and equivalence relations.
Functions: Definition, domain, codomain and range, Types of functions: one-to-one (into), many-to-one, onto and bijective, Composition and inverse of functions.</td></tr>
<tr><td colspan="7">Unit-II
Matrices and Determinants- Definition and types of matrices, Matrix operations, Determinants and their properties, Minors and cofactors, Adjoint and inverse of a square matrix, Rank of a matrix, Elementary row and column operations, Solution of System of linear equations.

Complex Numbers- Complex numbers and their algebraic properties, Representation of complex numbers, Real and imaginary parts, Modulus and conjugate, Polar representation of complex numbers, Algebra of complex numbers, Complex functions, Domain and range of complex functions, Limit and continuity of complex functions, Basic properties and applications of complex numbers.</td></tr>
<tr><td colspan="7">Unit-III
Differential Equations- Formation of differential equations, First-order differential equations, Special forms of first-order differential equations, Methods of solving first-order differential equations, Initial value problems, Existence and uniqueness of solutions, Conditions for existence and uniqueness, Applications of first-order differential equations
Analytical Geometry and Vector Algebra- Polar coordinates, Relation between Cartesian and polar coordinates, Polar equations of conics, Curves in polar coordinates, Differential Operators in Vector Calculus- Gradient, Directional derivatives, divergence and curl along with their physical interpretation, Double and triple integrals: Change of order of integration, Surface and volume integrals, Cylindrical and spherical coordinate systems,</td></tr>
</table>

Evaluation of multiple integrals in different coordinate systems.

Unit-IV

Trigonometry- Measurement of angles: degree, radian and centesimal measure, Trigonometric ratios and functions, Unit-circle representation, Signs of trigonometric functions in different quadrants, Fundamental trigonometric identities, Standard values of trigonometric functions, Compound angles, Multiple and sub-multiple angles,

Probability- Basic concepts of probability, Sample space and events, Types of events, Probability of an event, Addition and multiplication laws of probability, Conditional probability, Independent events, Bayes' Theorem, Measures of central tendency- Arithmetic mean, Median, Mode, Measures of dispersion- Range, Mean deviation and Standard deviation.

Text/Reference Books:

1. Lecture Based Modules for Bridge Course in Mathematics, AICTE, New Delhi (Prepared by IIT, BHU)
2. B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers.