

UNIVERSITY OF JAMMU

(NAAC ACCREDITED A + GRADE UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

NOTIFICATION

(22/Nov/Adp/74)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of the revised Syllabi and Courses of Studies in **Bachelor of Engineering (Electrical Engineering)** for Semester I & II under the **Credit Based System** as per the model curriculum of the AICTE (as given in the Annexure) for the candidates of (Govt./Pvt.) **Engineering Colleges affiliated with the University of Jammu** for the Examinations to be held in the years indicated against each Semester as under:-

Branch	Semester	For the Examination to be held in the years
Electrical	Semester-I	December 2022, 2023, 2024 and 2025
	Semester-II	May 2023, 2024, 2025 and 2026

The Syllabi of the course is available on the University Website: www.jammuuniversity.in.

Sd/-
DEAN ACADEMIC AFFAIRS

No. F.Acd/III/22/9985-9993

Dated: 22 /11/2022

Copy for information & necessary action to:-

1. Dean Faculty of Engineering
2. Principal, GCET/MBSCET/BCET/YCET
3. C.A to the Controller of Examinations
4. Deputy/Assistant Registrar (Exams/Confidential)
5. Incharge University Website

Sumitasharma
Deputy Registrar (Academic)
22/11/22
22/11/22
22/11/22

UNIVERSITY OF JAMMU

Annexure –I

COURSE SCHEME

B.E. 1st Semester Electrical Engineering

Examination to be held in the year Dec-2022, 2023, 2024, 2025

Contact Hours: 27

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	% change
			L	T	P	Internal	External			
BST1101	Basic Science Theory	Engineering Mathematics -I	2	1	0	50	100	150	3	100%
BST1103	Basic Science Theory	Applied Engineering Physics	2	1	0	50	100	150	3	100%
EET2101	Engineering Science Theory	Principles of Electrical Engineering	2	1	0	50	100	150	3	100%
MET5102	Engineering Science Theory	Engineering Graphics	3	0	0	50	100	150	3	100%
ECT1101	Engineering Science Theory	Basic Electronics Engineering	2	1	0	50	100	150	3	100%
HMT1102	Basic Science Theory	Universal Human Values	2	1	0	50	100	150	3	100%
MEP5112	Engineering Science Practical	Workshop Technology	0	0	3	50		50	1.5	100%
BSP1113	Basic Science Practical	Applied Engineering Physics Lab.	0	0	2	50		50	1	100%
EEP2111	Engineering Science Practical	Principles of Electrical Engineering Lab	0	0	2	50		50	1	100%
ECP1111	Engineering Science Practical	Basic Electronics Engineering Lab	0	0	2	50		50	1	100%
Total			13	5	9	500	600	1100	22.5	

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Examination to be held in the year Dec-2022, 2023, 2024, 2025

BRANCH: COMPUTER/CSE/IT/CIVIL/ECE/ELECTRICAL/MECHANICAL ENGINEERING

CREDITS: 3

CLASS: B.E. 1st SEMESTER

COURSE TITLE: ENGINEERING MATHEMATICS –I

COURSE NO: BST1101

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks	
L	T	P	Internal	External
2	1	0	50	100

Course Outcomes: At the end of the course the students will be able to	
CO 1	Learn general theorems of calculus, find maximum and minimum value of functions of two variables.
CO2	Understand the concept of definite integrals.
CO3	Learn basic concepts of complex trigonometry.
CO 4	Find the rank, eigen values/ vectors of matrices.

SECTION-A

UNIT-I: DIFFERENTIAL CALCULUS

Partial differentiation, Euler's theorem on homogeneous functions, Rolle's theorem, Mean value theorem, Taylor's and Maclaurin's series with remainder, Taylor's series in two variables, Maxima and Minima of functions of two variables, Method of Lagrange's multipliers. **(12 hours)**

UNIT-II: INTEGRAL CALCULUS

Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, double and triple integrals with simple problems. **(8 hours)**

SECTION-B

UNIT-III: COMPLEX TRIGONOMETRY

Hyperbolic functions of a complex variable, Inverse Hyperbolic functions, Logarithmic function of a complex variable; Summation of series by C+iS method. **(8 hours)**

UNIT-IV: MATRICES

Introduction, Rank of a matrix, Elementary transformations, Elementary matrices, Inverse using elementary transformation, Normal form of a matrix, Eigen values and Eigen vector, Properties of Eigen value, Cayley Hamilton Theorem, Diagonalization of matrix. **(14 hours)**

BOOKS RECOMMENDED:

- | | | |
|----|--------------------------------|--|
| 1 | Calculus and Analytic Geometry | Thomas and Finney, 9 th Edition, Pearson, 2002. |
| 2. | Differential Calculus | S. Narayan and P.K. Mittal, S.Chand, New Delhi. |
| 3. | Higher Engineering Mathematics | B.S Grewal, Khanna Publishers, New Delhi |
| 4. | Engineering Mathematics-I | Dr. Bhopinder Singh |
| 5. | Engineering Mathematics-II | Dr. Bhopinder Singh |

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

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Examination to be held in the year Dec-2022, 2023, 2024, 2025

CLASS: B.E 1ST SEMESTER

BRANCH: COMPUTER/CSE/IT/ECE/ELECTRICAL ENGINEERING

COURSE TITLE: APPLIED ENGINEERING PHYSICS

COURSE No: BST1103

CREDITS: 3

DURATION OF EXAM: 3 HRS

Hours/ Week			Marks	
L	T	P	Internal	External
2	1	0	50	100

Course Outcomes (CO): At the end of the course the Student will be able to -

CO1	Understand the significance of vector calculus and Maxwell's equations as the basis of Electromagnetic theory.
CO2	Acquire the basic principles of laser physics, quantum mechanics and their applications.
CO3	Acquire knowledge of semiconductor physics along with different aspects of applied optics & their applications.
CO4	Understand the working principle of optical fibres with their applications in various fields.

Section-A

UNIT I: ELECTROMAGNETIC FIELDS AND WAVES

Concepts of Del Operator- gradient, divergence, curl and their physical significances, Displacement Current. Maxwell's equations in integral and differential form, Poynting vector and Poynting theorem, Electromagnetic wave propagation in free space (e m wave equations for electric & magnetic fields for free space) & their solutions (plane wave solution), velocity of E M waves, Relation between E_0 & B_0 .

(08 hours)

UNIT-II: LASER PHYSICS

Concept and principle of Laser action, Spontaneous and Stimulated emission, Einstein's Co-efficient and relations, three and four level laser system, coherence and characteristics of laser light, Ruby, He -Ne and CO₂ Lasers, Applications of lasers

(05 hours)

UNIT -III: QUANTUM MECHANICS

Need of quantum mechanics, Compton effect, concept of wave function, Eigen function and Eigen values, operators in quantum mechanics, Expectation values, Schrodinger's wave equation (Steady-state and Time-dependent) for one- dimensional case, Applications of Schrodinger's equation (Time independent) to: Particle in a one-dimensional box of infinite height and concept of zero point energy

(08 hours)

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Section – B

UNIT-IV: SEMICONDUCTOR PHYSICS

Structure of Atoms, Energy band diagram, Metal, Insulator and Semiconductor, Intrinsic and Extrinsic semiconductors, Direct & Indirect semiconductors (E-k diagrams), Electron and hole concentration in intrinsic semiconductors, Charge densities in semiconductor, Generation & Recombination of charge carrier, Law of mobility & conductivity, Current densities in semiconductors, Fermi levels, Mass action law, Drift & Diffusion current and Einstein relation for p-n junction, Hall effect, Hall co-efficient & its applications.

(09 hours)

UNIT –V: APPLIED OPTICS

Thin films, Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected & transmitted light, Determination of wavelength and refractive index of monochromatic light by Newton's rings theory, Plane diffraction grating & its theory for secondary maxima & minima, polarized and unpolarized light, Nicol Prism as a Polarizer and Analyzer

(07 hours)

UNIT VI: FIBRE OPTICS

Optical Fibre, Physical structure and basic theory, Propagation of Light in Optical fibres, critical angle, Acceptance angle & acceptance cone, Numerical Aperture, Single mode & Multimode Fibres, Characteristics and General applications of Optical fibres.

(05 hours)

Books Recommended

1. Fundamentals of Electricity & Magnetism
2. Lasers Fundamentals and applications
3. Semiconductor Physics and Devices
4. Optics
5. Fibre Optics
6. Quantum Mechanics

Duggal & Chabbra
A. K. Ghatak
Donald A. Neamen
Brijlal & Subramaniam
Ghatak, Tyagrajan
N. Zettili

NOTE: There shall be total eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

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Examination to be held in the year Dec-2022, 2023, 2024, 2025

CLASS: B.E. 1st SEMESTER
BRANCH: ELECTRICAL/ CIVIL ENGINEERING
COURSE CODE: EET 2101

Credit-3

**TITLE: PRINCIPLES OF ELECTRICAL
ENGINEERING**
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks	
L	T	P	Internal	External
2	1	0	50	100

COURSE OUTCOMES: students will be able to understand and analyse	
CO.1	The basic concepts of electric circuit terminology, Kirchhoff's and Ohm's laws.
CO.2	The circuits using electrical theorems
CO.3	The basic terminologies in AC and star-delta circuits
CO.4	The working principle of single phase transformer.

SECTION-A

Unit-1

Electric Circuit Laws & Energy Sources: Basic electric circuit terminology, Ohm's law, Kirchhoff's laws, Circuit parameters (Resistance, inductance & capacitance), series & parallel combination of resistance, inductance & capacitance. ideal & practical voltage and current sources and their transformation, dependent voltage sources and dependent current sources.

(08 hours)

Unit-2

D.C. Circuit Analysis: Power and energy relations, analysis of series parallel D.C. circuits, Mesh & Nodal methods, Star- Delta transformation, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity Theorem.

(10 hours)

SECTION-B

Unit-3

A.C. Circuit: Introduction, Average and effective values of periodic functions, instantaneous and average power, Phasor and complex number representation. Solution of sinusoidally excited R, L, C circuits, Resonance in series and parallel circuits, quality factor. Concept of 3-phase-voltage and current in Wye (y), Delta circuits and their relationship.

(10 hours)

Unit-4

Transformers

Construction, principle operation of single phase transformer, ideal and practical transformer (no-load & on-load phasor diagrams), equivalent circuit, losses in transformers, transformer test (open circuit & short circuit), regulation and efficiency, auto transformer.

(08 hours)

RECOMMENDED BOOKS:

- | | |
|--|-----------------|
| 1. Electrical Engineering Fundamentals | V. Del toro |
| 2. Electrical Technology | H.Cotton |
| 3. Electrical Technology | E.Hughes |
| 4. Basic Electrical Engineering | A.K.Chakrabarti |
| 5. Basic Electrical Engineering | J.B Gupta |

NOTE : There shall be total eight questions, each question will be of 20 marks four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

Examination to be held in the year Dec-2022, 2023, 2024, 2025

CLASS: B.E. 1st SEMESTER

BRANCH: COMPUTER/CSE/IT/E&C/ELECTRICAL ENGINEERING

COURSE TITLE: ENGINEERING GRAPHICS

Credit: 3

COURSE NO: MET5102

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks	
L	T	P	Internal	External
3	0	0	50	100

COURSE OUTCOMES: Students will be able to:

CO1	Understand and use engineering scales with accuracy and interpret missing views.
CO2	Work with zeal of Industrial practices and standards.
CO3	Convert sketches to engineering drawings.
CO4	Fundamentally understand and perform Two and Three dimensional drawings.
CO5	Draw and understand orthographic projections of sections.

SECTION -A

Engineering Curves: Conventional lines and signs used in Engineering Drawing, Printing and Lettering, Curves used in Engineering Practice: Cycloidals, Involutes, Spirals and Hellices, Locus of a point on simple mechanisms.

Projection of Planes: Projections of a plane w.r.t. the principle planes in simple and inclined positions. Rotation method and the Auxiliary plane method.

Projection of Solids: Classification and main features-Prisms and Pyramids. Projection of solids inclined to both the reference planes by (I) Rotation Method, and (II) Auxiliary plane method. Projection of solids in combination (Co-axial) in simple and inclined positions.

Sectioning of Solids: Object of sectioning, Types of cutting planes, True shape of section, Auxiliary views of sections of multiple co-axial solids in simple and titled conditions. (20 hrs.)

SECTION -B

Interpenetration of Solids and Intersection of Surface: Intersection of geometrical solids/hollow sections, Tracing of lines of intersection by line method and by section method.

Development of Surfaces: Classification of surfaces, Methods of development-Straight line method and Radial line method, Development of solids and hollow sections in full or part development of transition pieces.

Orthographic Projections: Orthographic projection of simple blocks (First & Third angles), to draw the third view from given two views. Missing lines in projection. Introduction to Auto CAD. Basic Commands and Basic Drawing Practices. (21 hrs.)

RECOMMENDED BOOKS:

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|---------------------------------------|-----------------------------|
| 1. Engineering Drawing | P.S Gill |
| 2. Practical Geometry | V. Laxminarayan & GEV |
| 3. Engineering Graphics | K.L. Narayanan & P. Kamaish |
| 4. Principles of Engineering Graphics | P.E Giesecks |
| 5. Engineering Graphics | Frederic & Michelle. |

NOTE: There shall be total eight questions, four from each section. Five questions will have to be attempted selecting at least two from each section. Use of calculator is allowed.

Examination to be held in the year Dec-2022, 2023, 2024, 2025

CLASS: B.E. 1ST SEMESTER

BRANCH: COMPUTER /CSE/IT/ELECTRICAL ENGINEERING

Credits: 3

COURSE NO: ECT1101

TITLE: BASIC ELECTRONICS ENGG

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks	
L	T	P	Internal	External
2	1	0	50	100

COURSE OUTCOMES: After learning this course students will be able to:

CO1	To understand the fundamentals of semiconductor Physics.
CO2	To introduce the concepts of semiconductor devices with applications.
CO3	To enable the students to understand the working and applications of transistor
CO4	To understand the basics of communication systems.

SECTION-A

Unit-I: Semi-Conductors and Diodes: Introduction, Insulators, Semiconductors and Metals, Mobility and Conductivity, Intrinsic and Extrinsic Semiconductors, Charge Density, Current Components in Semiconductors, Continuity Equation, Introduction, Insulators, Semiconductors and Metals, Mobility and Conductivity. PN Junction Diode- Volt ampere characteristics, Diode capacitances, Static & dynamic resistances; Types of Diodes- Zener Diode, its breakdown phenomenon and its applications, Photodiodes, LED, Varactor Diode, Tunnel Diodes, Schottky diode. (10 Hrs)

Unit-II: Diode Applications: Rectifiers and Filter Circuit: Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier and their Analysis, LC and Pi Filters; Series and Shunt Diode Clippers, Clipping at Two Independent Levels, Clamping Operation, Clamping Circuit, Practical Clamping Circuits. (10 Hrs)

SECTION-B

Unit-III: Bipolar Junction Transistors: Symbol, Construction, and Characteristics of BJT, reach through phenomenon and Base width modulation, Transistor Configuration: CB, CE, CC Configuration with necessary current equations. Transistor as an amplifier and switch, Derivation related to Transistor Biasing and Bias Compensation Techniques. (10 Hrs)

Unit-IV: Basics of Communication System: Introduction to Analog and Digital Communication Systems, Block Diagram Representation of Communication System, the Basic idea of Transmitter and Receiver used for radio communication, Various Frequency bands used for Communication, Need of Modulation and Introduction to Cellular Communication. (8 Hrs)

BOOKS RECOMMENDED:

1. Integrated Electronics by J. Millman and C.C. Halkias, McGraw Hill Education, India.
2. Electronics Devices and Circuit Theory by R. Boylestad and L. Nashelsky, Pearson India.
3. Electronics Devices and Circuits-I by U. A. Bakshi and A. P. Godse, Technical Publications.
4. Electronic principles by L. Malvino, Tata McGraw Hill Education.
5. Electronic Communication Systems by G. Kennedy, McGraw Hill Education, India.

NOTE: There shall be total of eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

