CHRIST COLLEGE OF ENGINEERING
IRINJALAKUDA (AUTONOMOUS)

B. Tech.

Semester – I

CURRICULUM AND SYLLABUS

2025 Scheme (GROUP - B)

B. Tech – 2025
SEMESTER – S1 (GROUP - B)
SEMESTER – S1 - CURRICULUM & SYLLABUS

FIRST SEMESTER: Electronics and Communication Engineering															
10 Days Compulsory Induction Program and Universal Human Values															
Sl. No:	**Slot**	**Course Code**	**Course Type**	**Course Category**	**Course Title (Course Name)**	**Credit Structure**				**SS**	**Total Marks**		**Credits**	**Hrs./Week**
						L	**T**	**P**	**R**		**CIA**	**ESE**		
THEORY														
1	A	G25MAT111	BSC	GC	Mathematics for Electrical Science-1	3	0	0	0	4.5	40	60	3	3
2	B	G25PYE112	BSC	GC	Physics for Electrical Science	3	0	2	0	5.5	40	60	4	5
3	C	G25EGE104	ESC	GC	Engineering Graphics and Computer Aided Drawing	2	0	2	0	4	40	60	3	4
4	D	G25EET105	ESC	GC	Introduction to Electrical & Electronics Engineering (part 1: Electrical Engineering)	2	0	0	0	3	20	30	2+2 =4	4
					(Part 2: Electronics Engineering)	2	0	0	0	3	20	30		
5	F	A25ATE106	ESC	UC	Algorithmic Thinking with Python	3	0	2	0	5.5	40	60	4	4
6	I	A25HWE108	HWP	UC	Health and Wellness	1	0	1	0	0	50	0	1	2
PRACTICALS														
7	L	G25EEP107	ES	GC	Basic Electrical and Electronics Engineering Workshop	0	0	2	0	1	50	50	1	2
MANDATORY COURSES														
8	-		MC	UC	Activity Point Programme[$]								0	-
Total										**26.5**			**20**	**24**

- L-T-P-R = Lecture – Tutorial – Practical - Project
- SS (Self Study) Hours = 1.5*L+0.5*T+0.5*P+R
- CIA = Continuous Internal Assessment, and ESE = End Semester Examination

SEMESTER S1

MATHEMATICS FOR ELECTRICAL SCIENCE AND PHYSICAL SCIENCE - 1

(Common to Groups B & C)

Course Code	G25MAT111	**CIE Marks**	40
Teaching Hours/Week (L:T:P:R)	3:0:0:0	**ESE Marks**	60
Credits	3	**Exam Hours**	2 Hrs. and 30 Mins.
Prerequisites (if any)	Basic knowledge in single variable calculus and matrix operations.	**Course Type**	Theory

Course Objective:

1. To provide a comprehensive understanding and basic techniques of matrix theory to analyze linear systems.
2. To offer advanced knowledge and practical skills in solving second-order ordinary differential equations, applying Laplace transforms, and understanding Fourier series, enabling students to analyze and model dynamic systems encountered in engineering disciplines effectively.

SYLLABUS

Module No.	Description	Contact Hours
1	Linear systems of equations: Gauss elimination, Row echelon form, Linear Independence: rank of a matrix, Solutions of linear systems: Existence, Uniqueness (without proof), The matrix Eigen Value Problem, Determining Eigen values and Eigen vector, Diagonalization of matrices.	9
2	Homogeneous linear ODEs of second order, Superposition principle, General solution, Homogeneous linear ODEs of second order with constant coefficients (Method to find general solution, solution of linear Initial Value Problem). Non homogenous ODEs (with constant coefficients) - General solution, Particular solution by the method of undetermined coefficients (Particular solutions for the functions ke^x , kx^n, kcosωx, ksinωx , ke^αxcosωx, ke^αxsinωx), Initial value Problem for Non-Homogeneous Second order linear ODE(with constant coefficients), Solution by variation of parameters (Second Order).	9

3	Laplace Transform, Inverse Laplace Transform, Linearity property, First shifting theorem, Transform of derivatives, Solution of Initial value problems by Laplace transform (Second order linear ODE with constant coefficients with initial conditions at t=0 only), Unit step function, Second shifting theorem, Dirac delta function and its transform (Initial value problems involving unit step function and Dirac delta function are excluded), Convolution theorem (without proof) and its application to finding inverse Laplace transform of products of functions.	9
4	Taylor series representation (without proof, assuming the possibility of power series expansion in appropriate domains), Maclaurin series representation, Fourier series, Euler formulas, Convergence of Fourier series (Dirichlet's conditions), Fourier series of 2π periodic functions, Fourier series of 2l periodic functions, Half range sine series expansion, Half range cosine series expansion.	9

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Assignment (Activity based)	Assignment (Activity based)	Internal Examination-I (Written)	Internal Examination-II (Written)	Internal Examination-III (Written)	Total
10	10	30	30	30	
		A total of 90 marks will be scaled to 20			**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
● 2 questions from each module. ● Total of 8 questions, each carrying 3 marks **(8 x 3 = 24 Marks)**	● Each question carries 9 marks. ● Two questions will be given from each module, out of which 1 question should be answered. ● Each question can have a maximum of 3 sub divisions. **(4 x 9 = 36 Marks)**	**60**

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Solve the system of linear equations, compute eigen values and eigenvectors and apply these concepts to real-world problems in various fields	3
CO2	Analyze different forms of linear differential equations and examine their applicability in modeling and solving problems across various scientific disciplines.	4
CO3	Apply Laplace transform and inverse Laplace transform to solve ordinary differential equations with impulsive inputs relevant to engineering problems.	3
CO4	Analyze functions using Taylor and Fourier series to select suitable representations and examine their role in modeling periodic phenomena in engineering.	4
CO5	Able to develop, analyze and make use of theoretical concepts to solve complex problems and visualize the output	4

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 - Create

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- CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3												
CO2	3	3												
CO3	3	3												
CO4	3	3												
CO5	3	3			2	2		2	3		2			

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Advanced Engineering Mathematics	Erwin Kreyszig	John Wiley & Sons	10th Edition, 2016
2	Calculus	H. Anton,I. Biven, S.Davis	Wiley	12th edition, 2024

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Thomas' Calculus	Maurice D. Weir, Joel Hass, Christopher Heil, Przemyslaw Bogacki	Pearson	15th edition, 2023
2	Essential Calculus	J. Stewart	Cengage	2nd edition, 2017
3	Elementary Linear Algebra	Howard Anton, Chris Rorres	Wiley	11th edition, 2019
4	Bird's Higher Engineering Mathematics	John Bird	Taylor & Francis	9th edition, 2021
5	Higher Engineering Mathematics	B. V. Ramana	McGraw-Hill Education	39th edition, 2023
6	Calculus	Howard Anton, Irl Bivens, Stephens Davis	Wiley	12th Edition, 2024
7	Signals and Systems	Simon Haykin, Barry Van Veen	Wiley	2nd edition,

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://archive.nptel.ac.in/courses/111/107/111107164/
2	https://archive.nptel.ac.in/courses/111/104/111104031/
3	https://archive.nptel.ac.in/courses/111/106/111106139/
4	https://archive.nptel.ac.in/courses/111/101/111101164/

SEMESTER S1

PHYSICS FOR ELECTRICAL SCIENCE

(Common to Group B)

Course Code	G25PYE112	**CIE Marks**	40
Teaching Hours/Week (L:T:P:R)	3:0:2:0	**ESE Marks**	60
Credits	4	**Exam Hours**	2 Hrs. and 30 Mins.
Prerequisites (if any)	None	**Course Type**	Theory+Lab

Course Objective:

1. To provide students with a solid background in the fundamentals of Physics and to impart this knowledge in Electrical Science disciplines.
2. To develop scientific attitudes and enable students to correlate Physics concepts with their core programs.
3. To equip students with practical knowledge that complements their theoretical studies and develop their ability to create practical applications and solutions in engineering based on their understanding of Physics.

SYLLABUS

Module No.	Description	Contact Hours
1	**Semiconductor Physics** Intrinsic semiconductor, Derivation of density of electrons in conduction band and density of holes in valence band, Intrinsic carrier concentration, Variation of Intrinsic carrier concentration with temperature, Extrinsic semiconductor (qualitative) Formation of p-n junction, Fermi level in semiconductors-intrinsic and extrinsic, Energy band diagram of p-n junction - Qualitative description of charge flow across a p-n junction - Forward and reverse biased p-n junctions, Diode equation (Derivation), I-V Characteristics of p-n junction.	9
2	**Semiconductor Devices** Semiconductor devices- Rectifiers- Full wave and Half wave. Zener diode VI characteristics, Tunnel diode-VI characteristics, Semiconductor Laser (Construction and working), Applications Photonic devices (Qualitative treatment only) - Photo detectors (Junction and PIN photodiodes), Solar cells- IV Characteristics, Efficiency, Stringing of Solar cells to solar panel, Light Emitting Diode, Applications	9

3	**Superconductivity & Dielectrics** Super conductivity, Transition temperature, Critical field, Meissner effect, Type I and Type II Super conductors, Applications of superconductors. Dielectric constant, Polarization, Permittivity- relative permittivity, Relation between polarization and dielectric constant, Types of Polarization, Internal fields in liquids and solids, Clausius Mossotti Relation, Dielectric loss(qualitative), Dielectric breakdown (qualitative)	9
4	**Laser & Fiber Optics** Optical processes - Absorption, Spontaneous emission and stimulated emission, Properties of laser, Principle of laser - conditions for sustained lasing – Population inversion, Pumping, Metastable states, Basic components of laser - Active medium- Optical resonant cavity, Construction and working of Ruby laser, Semiconductor Laser (Qualitative), Applications of laser. Optical fiber-Principle of propagation of light, Types of fibers-Step index and Graded index fibers, Numerical aperture –Derivation, Applications of optical fibers - Fiber optic communication system (block diagram)	9

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Continuous Assessment	Internal Examination-I (Written)	Internal Examination-II (Written)	Internal Examination-III (Written)	Internal Lab Examination	Total
10	30	30	30	10	
	A total of 90 marks will be scaled to 20.				**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
● 2 questions from each module. ● Total of 8 questions, each carrying 3 marks **(8 x 3 = 24 Marks)**	● Each question carries 9 marks. ● Two questions will be given from each module, out of which 1 question should be answered. ● Each question can have a maximum of 3 sub divisions. **(4 x 9 = 36 Marks)**	**60**

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Apply the basic theory of superconductivity and dielectrics to solve practical engineering problems in electrical, electronic and energy storage systems for sustainable applications.	3
CO2	Analyse the working principles of lasers and optical fibres and evaluate their applications in communication, medical technology, and industrial processing	4
CO3	Apply the fundamentals of semiconductor physics to analyse material properties for producing clean energy.	3
CO4	Analyse the basic concepts of semiconductor physics to design different semiconductor devices for producing clean energy.	4
CO5	Apply scientific principles in an engineering context, training students through hands-on learning to promote quality education.	3

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 - Create

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- CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2												
CO2	2	2												
CO3	2	2												
CO4	2	2				3								
CO5	2	2			2			3	3		2			

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Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Concepts of Modern Physics	Arthur Beiser Tata	McGraw Hill Publications	6th Edition, 2003
2	Engineering Physics	H K Malik and A K Singh	McGraw Hill	2nd Edition
3	A Textbook of Engineering Physics	MN Avadhanulu, P G Kshirsagar, TVS Arun Murthy	S. Chand	11th Edition, 2018

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Semiconductor Devices Fundamentals	Robert F Pierret	Pearson Education	1995
2	Advanced Semiconductor Fundamental	Robert F Pierret	Pearson Education	2nd Edition
3	Solid State Electronic Devices	Ben G Streetman and Sanjay Kumar Banerjee	Pearson Education	6th Edition 2010
4	Solid State Physics	S.O. Pillai	New age international publishers	10th Edition, 2022
5	Introduction to Solid State Physics	Charles Kittel	Wiley India Edition	2019
6	Advanced Engineering Physics	Premlet B	Phasor Books	10th Edition, 2017
7	A Text Book of Engineering Physics	I. Dominic and. A. Nahari,	Owl Books Publishers	Revised Edition, 2016

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://nptel.ac.in/courses/108106181
2	https://nptel.ac.in/courses/108108112
3	https://nptel.ac.in/courses/115103108
4	https://nptel.ac.in/courses/115102124

Continuous Assessment (10 Marks)

i. Preparation and Pre-Lab Work (2 Marks)

- Pre-Lab Assignments: Assessment of pre-lab assignments or quizzes that test understanding of the upcoming experiment.
- Understanding of Theory: Evaluation based on students' preparation and understanding of the theoretical background related to the experiments.

ii. Conduct of Experiments (2 Marks)

- Procedure and Execution: Adherence to correct procedures, accurate execution of experiments, and following safety protocols.
- Skill Proficiency: Proficiency in handling equipment, accuracy in observations, and troubleshooting skills during the experiments.
- Teamwork: Collaboration and participation in group experiments.

iii. Lab Reports and Record Keeping (3 Marks)

- Quality of Reports: Clarity, completeness and accuracy of lab reports. Proper documentation of experiments, data analysis and conclusions.
- Timely Submission: Adhering to deadlines for submitting lab reports/rough record and maintaining a well-organized fair record.

iv. Viva Voce (3 Marks)

- Oral Examination: Ability to explain the experiment, results and underlying principles during a viva voce session.

Final Marks Averaging: *The final marks for preparation, conduct of experiments, viva, and record are the average of all the specified experiments in the syllabus.*

Evaluation Pattern for Lab Examination (5 Marks)

1. **Procedure/Preliminary Work/Conduct of Experiments (2 Marks)**
   - Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
   - Preliminary Work and Planning: Thoroughness in planning and organizing materials/equipment.
   - Setup and Execution: Proper setup and accurate execution of the experiment or programming task
2. **Result (2 Marks)**
   - Accuracy of Results: Precision and correctness of the obtained results.
3. **Viva Voce (1 Marks)**
   - Proficiency in answering questions related to theoretical and practical aspects of the subject.

Experiment List (Minimum 10 Experiments)

Experiment No.	Experiment
1	Diode characteristics
2	Zener diode- V-I characteristics
3	Tunnel diode –V-I characteristics
4	Half wave rectifier
5	Full wave rectifier
6	Hall effect in semiconductors
7	Determination of band gap energy of a semiconductor
8	Characteristics of LED

9	Solar Cell- V-I and Intensity Characteristics
10	Laser – Determination of wavelength using diffraction grating
11	Laser- To measure the wavelength using a millimetre scale as a grating
12	Compare the variation of current with potential difference, for a metal, filament bulb and semiconductor diode.
13	Determination of dielectric constant
14	CRO -Measurement of frequency and amplitude of wave forms
15	Photo diode - V-I Characteristics
16	Numerical aperture of optical fiber

SEMESTER S1

ENGINEERING GRAPHICS AND COMPUTER AIDED DRAWING

(Common to Group A, B & D)

Course Code	G25EGE104	**CIE Marks**	40
Teaching Hours/Week (L:T:P:R)	2:0:2:0	**ESE Marks**	60
Credits	3	**Exam Hours**	2 Hrs. and 30 Mins.
Prerequisites (if any)	None	**Course Type**	Theory + Lab

Course Objective:

1. To learn the principles and techniques of dimensioning and preparing engineering drawings.
2. To develop the ability to accurately interpret and understand engineering drawings.
3. To learn the features of CAD software

SYLLABUS

Module No.	Description	Contact Hours
1	**Introduction:** Relevance of technical drawing in engineering field. Types of lines, Dimensioning, BIS code of practice for technical drawing. (No questions for the end semester examination) Projection of points in different quadrants, Projection of straight lines inclined to one plane and inclined to both planes. Trace of a line. Inclination of lines with reference planes. True length and true inclinations of line inclined to both the reference planes.	9
2	Projection of Simple solids such as Triangular, Rectangle, Square, Pentagonal and Hexagonal Prisms, Pyramids, Cone and Cylinder only. Projection of solids in simple position including profile view. Projection of solids with axis inclined to one of the reference planes and with axis inclined to both reference planes.	9

3	**Sections of Solids:** Sections of Prisms, Pyramids, Cone and Cylinder only, with axis in vertical position and cut by different section planes. True shape of the sections. (Exclude true shape given problems) **Development of Surfaces:** Development of surfaces of the solids and solids cut by different section planes. (Exclude problems with through holes)	9
4	**Isometric Projection:** Isometric scale- Isometric View and Projections of Prisms, Pyramids, Cone, Cylinder, Sphere, Hemisphere and their combinations. **Computer Aided Drawing (CAD):** Introduction, Role of CAD in design and development of new products, Advantages of CAD. Creating two-dimensional drawing with dimensions using suitable software. (CAD, only internal evaluation)	9

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Assignment (Activity based)	Internal Examination-I (Written)	Internal Examination-II (Written)	Internal Examination-III (Written)	Internal Lab Examination	Total
10	30	30	30	10	
	Average of best 2 and then convert into 20				**40**

End Semester Examination Marks (ESE)

	Total
2 Questions from one module Total 8 Questions, each question carries 15 marks **(15 x 4 = 60 Marks)**	**60**

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Apply Engineering drawing principles and projection methods, to accurately represent points and lines in different quadrants.	3
CO2	Visualize and model projections of simple solids for resource-efficient manufacturing and sustainable product design	4
CO3	Prepare sectional views and surface developments to optimize material usage, reduce waste, and support eco-friendly production systems	3
CO4	Interpret principles of isometric projections to convey 3d information.	3
CO5	Execute 2D sketching and 3D modelling using CAD tools.	3

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Engineering Graphics	Varghese P. I.	V.I.P. Publishers	2018 Edition
2	Engineering Graphics	Benjamin J.	Pentex Publishers	2016 Edition
3	Engineering Graphics	John K. C.	Prentice Hall India	2017 Edition
4	Engineering Drawing	Bhatt N. D.	Charotar Publishing House Pvt. Ltd.	60th Edition. 2019
5	Engineering Graphics	Anilkumar K. N.	Adhyuth Narayan Publishers	2022 Edition

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year

1	Engineering Graphics with AutoCAD	Kulkarni D. M., Rastogi A. P., and Sarkar A. K.	Prentice Hall India	2020 Edition
2	Engineering Drawing & Graphics	Venugopal K.	New Age International	5th Edition, 2011
3	Engineering Drawing	Parthasarathy N. S., and Murali V.	Oxford University Press	2015 Edition

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://archive.nptel.ac.in/courses/112/102/112102304/
2	https://archive.nptel.ac.in/courses/112/102/112102304/
3	https://archive.nptel.ac.in/courses/112/102/112102304/
4	https://archive.nptel.ac.in/courses/112/102/112102304/

SEMESTER S1

INTRODUCTION TO ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Group A & B)

Course Code	G25EET105	**CIE Marks**	40
Teaching Hours/Week (L:T:P:R)	4:0:0:0	**ESE Marks**	60
Credits	4	**Exam Hours**	2 Hrs. and 30 Mins.
Prerequisites (if any)	None	**Course Type**	Group Core-Theory

Course Objective:

1. To provide an understanding of the fundamental principles of electrical engineering
2. To introduce the working principles of fundamental electronic devices and circuits
3. To provide an overview of the basic concepts in different types of communication

SYLLABUS

Module No.	Description	Contact Hours
1	**Elementary concepts of DC electric circuits:** Current and Voltage Division Rule - Relative potential Capacitors & Inductors: V-I relations and Energy stored. Ohms Law and Kirchhoff's laws – numerical problems. Star-delta conversion (resistive networks only - derivation not required) - numerical problems. Node voltage methods-matrix representation-solution of network equations by matrix methods - numerical problems. **Elementary Concepts of Magnetic circuits:** Magnetic Circuits: Basic Terminology: MMF, field strength, flux density, reluctance - Comparison between electric and magnetic circuits – Series and parallel magnetic circuits with composite materials (numerical problems not needed) **Analysis of DC Electric circuits:** Mesh current method – matrix representation - Solution of network equations.	11
2	**Electromagnetic Induction:** Faraday's laws, Lenz's law- statically induced and dynamically induced emf – Self-inductance and mutual inductance, coefficient of coupling (numerical problems not needed) **Alternating Current fundamentals:** Generation of alternating voltages - Representation of sinusoidal waveforms: frequency, period, average value, RMS value and form factor - numerical problems AC Circuits: Phasor representation of sinusoidal quantities,	11

	Trigonometric, Rectangular, Polar and complex forms.	

	Analysis of simple AC circuits: Purely resistive, inductive & capacitive circuits; Inductive and capacitive reactance, concept of impedance - numerical problems. RL, RC and RLC series circuits- power factor, active, reactive and apparent power. Simple numerical problems. Three phase AC systems: Generation of three phase voltages, advantages of three phase systems, star and delta connections (balanced only), relation between line and phase voltages, line and phase currents- numerical problems	
3	**Introduction to Electronic devices:** Passive and active components in electronics Working of PN junction diode, V-I characteristics of PN Junction diode Zener diode and avalanche breakdown. Basics of Zener voltage regulator, Block diagram of DC power supply, circuit and working of half wave, full wave and bridge rectifiers, ripple factor (with and without capacitor filters) Construction, working and V-I Characteristics of BJT, Input output characteristics of CE configuration, Comparison of CE, CB and CC configurations. Concept of biasing and load line Transistor as a switch, Transistor as an amplifier (Circuit Diagram and working) RC coupled amplifier - Circuit diagram and frequency response Introduction to FET, Construction and working of N-channel and P-Channel MOSFETs	13
4	**Modern Electronics and its applications:** General block diagram of a Communication system, Block diagram of Fiber optic Communication system Concept of AM and FM (No derivation required), Block diagram of AM and FM super-heterodyne receiver Basic concepts of Wired and Wireless communication, Block diagram of GSM Comparison of 3G, 4G, 5G and 6G communication technologies Block diagrams of electronic instrumentation system, Digital Multimeter, Function generator Introduction to CRO and Lissajous patterns Applications of modern electronics – IoT based smart homes, healthcare and agriculture (Case study only)	9

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Assignment (Activity based)	Assignment (Activity based)	Internal Examination-I (Written)	Internal Examination-II (Written)	Internal Examination-III (Written)	Total
10	10	30	30	30	
		A total of 90 marks will be scaled to 20			**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
• 2 questions from each module. • Total of 8 questions, each carrying 3 marks **(8 x 3 = 24 Marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4 x 9 = 36 Marks)**	**60**

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Apply fundamental concepts and circuit laws to solve simple DC/AC electric circuits	3
CO2	Design basic electronic circuits with the knowledge of passive and active electronic components	3
CO3	Apply fundamental concepts of magnetic circuits to classify series and parallel magnetic circuits and design the values of self and mutual inductance of coils	2
CO4	Distinguish the principles of various Communication systems & electronic instruments	2
CO5	Analyse AC circuits with resistive, inductive and capacitive loads and solve three phase Star and Delta connected circuits	4
CO6	Apply knowledge of modern electronics to study case studies related to IoT applications in smart homes, healthcare and agriculture	3
CO7	Design and Develop applications of modern electronics in contemporary world	3

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

CO-PO Mapping

	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11
CO-1	3	3		2		2					2
CO-2		2		2		2					2
CO-3	3	3		2		2					2
CO-4	2	2	2	2		2					2
CO-5	3	3		2		2					2
C0-6	2	3	2	2		2					3
C0-7	3	3	3	3	2	3	2	3	3	3	3

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Basic Electrical Engineering Tata	D P Kothari and I J Nagrath	McGraw Hill	4th Edition, 2019
2	Schaum's Outline of Basic Electrical Engineering	J. J. Cathey and Syed A Nasar	Tata McGraw Hill	3rd Edition, 2010
3	Basic Electronics: Principles and Applications	Chinmoy Saha, Arindham Halder and Debarati Ganguly	Cambridge University Press	1st Edition, 2018
4	Basic Electrical and Electronics Engineering	D. P. Kothari and I. J. Nagrath	McGraw Hill	2nd Edition, 2020
5	The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World	Michael Miller	QUE	1st Edition, 2015
6	Basic Electronics and Linear Circuits	N N Bhargava D C Kulshreshtha and S. C. Gupta	McGraw Hill	2nd Edition, 2017
7	Electronic Communication Systems	Kennedy and Davis	McGraw Hill	6th Edition, 2017

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Basic Electrical Engineering	D C Kulshreshtha	Tata McGraw Hill	2nd Edition, 2019
2	Electrical Engineering Fundamentals	Del Toro V	Pearson Education	2nd Edition, 2019
3	Basic Electrical Engineering	T. K. Nagsarkar, M. S. Sukhija	Oxford Higher Education	3rd Edition, 2017
4	Electronics: A Systems Approach	Neil Storey	Pearson	6th Edition, 2017
5	Electronic Devices and Circuit Theory	Robert L. Boylestad and Louis Nashelsky	Pearson	11th Edition 2015
6	Principles of Electronic Communication Systems	Frenzel L. E.	McGraw Hill	4th Edition, 2016
7	Internet of Things: Architecture and Design Principles	Raj Kamal	McGraw Hill	1st Edition, 2017
8	Electronic Communication	Dennis Roddy and John Coolen	Pearson	4th Edition, 2008

SEMESTER S1

ALGORITHMIC THINKING WITH PYTHON

(Common to All Branches)

Course Code	A25ATE106	**CIE Marks**	40
Teaching Hours/Week (L:T:P:R)	3:0:2:0	**ESE Marks**	60
Credits	4	**Exam Hours**	2 Hrs. and 30 Mins.
Prerequisites (if any)	None	**Course Type**	Theory + Lab

Course Objective:

1. To provide students with a thorough understanding of algorithmic thinking and its practical applications in solving real-world problems. To develop the ability to accurately interpret and understand engineering drawings.
2. To explore various algorithmic paradigms, including brute force, divide-and-conquer, dynamic programming, and heuristics, in addressing and solving complex problems.

SYLLABUS

Module No.	Description	Contact Hours
1	**Problem-Solving Strategies**: - Problem-solving strategies defined, Importance of understanding multiple problem-solving strategies, Trial and Error, Heuristics, Means-Ends Analysis, and Backtracking (Working backward). **The Problem-Solving Process:** - Computer as a model of computation, Understanding the problem, formulating a model, developing an algorithm, Writing the program, Testing the program, and evaluating the solution. **Essentials of Python Programming:** - Creating and using variables in Python, Numeric and String data types in Python, Using the math module, Using the Python Standard Library for handling basic I/O - print, input, Python operators and their precedence.	7
2	**Algorithm and Pseudocode Representation:** - Meaning and Definition of Pseudocode, Reasons for using pseudocode, The main constructs of pseudocode - Sequencing, selection (if-else structure, case structure) and repetition (for, while, repeat-until loops). Sample problems. **Flowcharts:** - Symbols used in creating a Flowchart - start and end, arithmetic calculations, input/output operation, decision (selection),	9

	module name (call), for loop (Hexagon), flow-lines, on-page connector, off-page connector.	
3	**Selection and Iteration Using Python:** - if-else, elif, for loop, range, while loop. Sequence data types in Python - list, tuple, set, strings, dictionary, Creating and using Arrays in Python (using Numpy library). **Decomposition and Modularization*:** - Problem decomposition as a strategy for solving complex problems, Modularization, Motivation for modularization, Defining and using functions in Python, Functions with multiple return values **Recursion:** - Recursion Defined, Reasons for using Recursion, The Call Stack, Recursion and the Stack, Avoiding Circularity in Recursion, Sample problems.	10
4	**Computational Approaches to Problem-Solving:** Brute-force Approach, Divide-and-conquer Approach, Dynamic Programming Approach, Greedy Algorithm Approach, Randomized Approach.	10

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Continuous Assessment	Internal Examination-I (Written)	Internal Examination-II (Written)	Internal Examination-III (Written)	Internal Lab Examination	Total
10	30	30	30	10	
	A total of 90 marks will be scaled to 20.				**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
● 2 questions from each module. ● Total of 8 questions, each carrying 3 marks **(8 x 3 = 24 Marks)**	● Each question carries 9 marks. ● Two questions will be given from each module, out of which 1 question should be answered. ● Each question can have a maximum of 3 sub divisions. **(4 x 9 = 36 Marks)**	**60**

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Utilize computing as a model for solving real-world problems.	2
CO2	Articulate a problem before attempting to solve it and prepare a clear and accurate model to represent the problem.	2, 3
CO3	Utilize effective algorithms to solve formulated models and translate algorithms into executable programs.	2, 3
CO4	Interpret problem-solving strategies, a systematic approach to solving computational problems, and essential Python programming skills.	2, 3
CO5	Design and implement a mini-project using algorithmic and problem-solving strategies to address real-world sustainability challenges.	2, 3

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3			1						2			3
CO2	3	3		3	1						2	2	2	
CO3	3	3		3	3						2			3
CO4	3	3		3	3						3			3
CO5	3	3		3	2	3	2	3	3	3	3	2	2	3

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Problem solving & programming concepts	Maureen Sprankle, Jim Hubbard	Pearson	9th Edition, 2011
2	How to Solve It: A New Aspect of Mathematical Method	George Pólya	Princeton University Press	2nd Edition, 2015

3	Creative Problem Solving: An Introduction	Donald Treffinger., Scott Isaksen, Brian Stead-Doval	Prufrock Press	4th Edition, 2005
4	Psychology (Sec. Problem Solving.)	Spielman, R. M., Dumper, K., Jenkins, W., Lacombe, A., Lovett, M., & Perlmutter, M	H5P Edition	1st Edition, 2021
5	Computational Thinking: A Primer for Programmers and Data Scientists	G Venkatesh Madhavan Mukund	Mylspot Education Services Pvt Ltd	1st Edition, 2020
6	Computer Arithmetic Algorithms	Koren, Israel	AK Peters/CRC Press	2nd Edition, 2001

7	Python for Everyone	Cay S. Horstmann, Rance D. Necaise	Wiley	3rd Edition, 2024
8	Introduction to Computation and Programming using Python	Guttag John V	PHI	2nd Edition, 2016

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://opentextbc.ca/h5ppsychology/chapter/problem-solving/
2	https://onlinecourses.nptel.ac.in/noc21_cs32/preview

Continuous Assessment (10 Marks)

Accurate Execution of Programming Tasks

- Correctness and completeness of the program
- Efficient use of programming constructs
- Handling of errors.
- Proper testing and debugging

Evaluation Pattern for Lab Examination (10 Marks)

1. Algorithm (2 Marks)

Algorithm Development: Correctness and efficiency of the algorithm related to the question.

2. Programming (3 Marks)

Execution: Accurate execution of the programming task.

3. Result (3 Marks)

Accuracy of Results: Precision and correctness of the obtained results.

4. Viva Voce (2 Marks)

Proficiency in answering questions related to theoretical and practical aspects of the subject.

Sample Classroom Exercises:

1. Identify ill-defined problem and well-defined problems
2. How do you differentiate the methods for solving algorithmic problems: introspection, simulation, computer modelling, and experimentation?
3. Use cases for Trial and error, Algorithm, Heuristic and Means-ends analysis can be applied in proffering solution to problems
4. Use a diagram to describe the application of Tower of Hanoi in choosing and analysing an action at a series of smaller steps to move closer to the goal

5. What effect will be generated if the stage that involves program writing is not observed in the problem-solving process?
6. What effect will be generated if the stage that involves program writing is not observed in the problem-solving process?
7. Evaluate different algorithms based on their efficiency by counting the number of steps.
8. Recursive function that takes a number and returns the sum of all the numbers from zero to that number.
9. Recursive function that takes a number as an input and returns the factorial of that number.
10. Recursive function that takes a number 'n' and returns the nth number of the Fibonacci number.
11. Recursive function that takes an array of numbers as an input and returns the product of all the numbers in the list.

LAB Experiments:

1. Demonstrate about Basics of Python Programming
2. Demonstrate about fundamental Data types in Python Programming. (i.e., int, float, complex, bool and string types)
3. Demonstrate different Arithmetic Operations on numbers in Python.
4. Create, concatenate, and print a string and access a sub-string from a given string.
5. Familiarize time and date in various formats (Eg. "Sun May 29 02:26:23 IST 2017")
6. Write a program to create, append, and remove lists in Python using numPy.
7. Programs to find the largest of three numbers.
8. Convert temperatures to and from Celsius, and Fahrenheit. [Formula: c/5 = f-32/9]
9. Program to construct the stars (*) pattern, using a nested for loop
10. Program that prints prime numbers less than 20.
11. Program to find the factorial of a number using Recursion.
12. Recursive function to add two positive numbers.
13. Recursive function to multiply two positive numbers
14. Recursive function to the greatest common divisor of two positive numbers.
15. Program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is a right triangle (Recall from the Pythagorean Theorem that in a right triangle, the square of one side equals the sum of the squares of the other two sides). Implement using functions.
16. Program to define a module to find Fibonacci Numbers and import the module to another program.
17. Program to define a module and import a specific function in that module to another program.
18. Program to check whether the given number is a valid mobile number or not using functions?

Rules:

1. Every number should contain exactly 10 digits.
2. The first digit should be 7 or 8 or 9

SEMESTER S1

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP

(Common to All Groups except for Civil Engineering Branch)

Course Code	B25-EWP-107	**CIE Marks**	50
Teaching Hours/Week (L:T:P:R)	0:0:2:0	**ESE Marks**	50
Credits	4	**Exam Hours**	2 Hrs. and 30 Mins.
Prerequisites (if any)	None	**Course Type**	Lab

Course Objective:

1. To create awareness and familiarity with electrical wiring and safety measures to be taken.
2. To Identify various electronic components and to operate various measuring instruments
3. Learn to setup simple electronic circuits on breadboard and PCB

SYLLABUS

Expt. No.	Experiments
Electrical Workshop (Minimum of 7 Experiments to be done)	
1	a) Demonstrate the precautionary steps adopted in case of Electrical shocks. b) Identify different types of cables, wires, switches, fuses, fuse carriers, MCB, ELCB and MCCB, familiarize the ratings.
2	Wiring of a simple light circuit for light/ fan point (PVC conduit wiring) and a 6A plug socket with individual control.
3	Wiring of light/fan circuit using two-way switches. (Staircase wiring)
4	Wiring of fluorescent lamp and a power plug (16 A) socket with a control switch.
5	Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, main switch and Energy meter.
6	Familiarisation of step up and step-down transformers, (use low voltage transformers) Measurement and representation of voltage and waveform to scale in graph sheet with the help of CRO

7	Familiarisation of rheostats, measurement of potential across resistance elements and introducing the concept of relative potential using a DC circuit.
8	a) Identify battery specifications using different types of batteries. (Lead acid, Li Ion, NiCd etc.) b) Familiarize different types of earthing (Pipe, Plate Earthing, Mat Schemes) and ground enhancing materials (GEM).
ELECTRONICS WORKSHOP (Minimum of 7 Experiments to be done)	
1	Familiarization/Identification of electronic components with specification (Functionality, type, size, colour coding, package, symbol and cost of -Active, Passive, Electrical, Electronic, Electro-mechanical, Wires, Cables, Connectors, Fuses, Switches, Relays, Crystals, Displays, Fasteners, Heat sink etc.)
2	Drawing of electronic circuit diagrams using BIS/IEEE symbols and Interpret data sheets of discrete components and IC's
3	Familiarization/Application of testing instruments and commonly used tools. - Multimeter, Function generator, Power supply, CRO, DSO. Soldering iron, Desoldering pump, Pliers, Cutters, Wire strippers, Screw drivers, Tweezers, Crimping tool, Hot air soldering and de- soldering station
4	Testing of electronic components using multimeter - Resistor, Capacitor, Diode, Transistor and JFET.
5	Printed circuit boards (PCB) - Types, Single sided, Double sided, PTH, Processing methods. Design and fabrication of a single sided PCB for a simple circuit.
6	Inter-connection methods and soldering practice. Bread board, Wrapping, Crimping, Soldering - types - selection of materials and safety precautions. Soldering practice in connectors and general-purpose PCB, Crimping.
7	Assembling of electronic circuit/system on general purpose PCB, test and show the functioning (Any two)- Fixed voltage power supply with transformer ● Rectifier diode ● Capacitor filter ● Zener/IC regulator Square wave generation using IC 555 timer in IC base.
8	Assembling of electronic circuits using SMT (Surface Mount Technology) stations.
9	Introduction to EDA tools (such as KiCad or XCircuit)

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Preparation/Pre-Lab Work, experiments, Viva and Timely completion of Lab Reports / Record (Continuous Assessment)	Total
40	**40**

End Semester Examination Marks (ESE)

Procedure/ Preparatory work/Design/ Algorithm	Conduct of experiment/ Execution of work/ troubleshooting/ Programming	Result with valid inference/ Quality of Output	Viva voce	Record	Total
10	**25**	**10**	**10**	**5**	**60**

Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified Lab record.

Pass Criteria:

- A student must score a minimum of 50% overall, combining marks from both Continuous Internal Evaluation (CIE) and End Semester Examination (ESE).
- In addition, the student must secure at least 40% in the End Semester Examination (ESE).

The ESE evaluation carried out by a panel of faculty members. This panel must include at least one faculty member who was not involved in the Continuous Internal Evaluation (CIE) of the lab course.

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Identify and familiarise various electrical components.	2
CO2	Identify and familiarise various electronic components.	2
CO3	Illustrate the connection diagram and identify the suitable accessories necessary for wiring simple electric circuits.	3

CO4	Apply the design procedure of simple electronic circuits on breadboard, PCB and Operate various measuring instruments to take measurements of circuit parameters.	3
CO5	Design and Interpret basic circuit diagrams and translate them into physical layouts for prototyping and testing	3,5

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2												
CO2	2	2												
CO3	3	2												
CO4	3	2			2									
CO5	3	2			2	2		3	3	2	2			

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Electrical Design Estimating and Costing	K B Raina and S K Bhattacharya	New Age International Publishers	2nd Edition, 2024
2	Electrical Systems Design	M. K. Giridharan	I K International Publishing House Pvt. Ltd.	3rd Edition, 2022
3	Basic Electrical Engineering	D P Kothari and I J Nagrath	Tata McGraw Hill	4th Edition, 2019
4	Basic Electronics and Linear Circuits	N N Bhargava, D C Kulshreshtha and S C Gupta	McGraw Hill	2nd Edition, 2017

Continuous Assessment with Equal Weightage for Both Specialisations (10 Marks)

1. Preparation and Pre-Lab Work (10 Marks)

Algorithm Development: Correctness and efficiency of the algorithm related to the question.

2. Programming (3 Marks)

Execution: Accurate execution of the programming task.

3. Result (3 Marks)

Accuracy of Results: Precision and correctness of the obtained results.

4. Viva Voce (2 Marks)

Proficiency in answering questions related to theoretical and practical aspects of the subject.

Evaluation Pattern for End Semester Examination with equal weightage in both specializations (60 Marks)

1. **Procedure/Preliminary Work/Design/Algorithm (10 Marks)**
    - Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
    - Preliminary Work and Planning: Thoroughness in planning and organizing materials/equipment.
    - Algorithm Development: Correctness and efficiency of the algorithm related to the experiment.
    - Creativity and logic in algorithm or experimental design.
2. **Conduct of Experiment/Execution of Work/Programming (25 Marks)**
    - Setup and Execution: Proper setup and accurate execution of the experiment or programming task.
3. **Result with Valid Inference/Quality of Output (10 Marks)**
    - Accuracy of Results: Precision and correctness of the obtained results.
    - Analysis and Interpretation: Validity of inferences drawn from the experiment or quality of program output.
4. **Viva Voce (10 Marks)**
    - Ability to explain the experiment, procedure results and answer related questions
    - Proficiency in answering questions related to theoretical and practical aspects of the subject.
5. **Record (5 Marks)**
    - Completeness, clarity, and accuracy of the lab record submitted

SEMESTER S1

HEALTH AND WELLNESS

(Common to all Groups)

Course Code	A25HWE108	**CIE Marks**	50
Teaching Hours/Week (L:T:P:R)	1:0:1:0	**ESE Marks**	0
Credits	1	**Exam Hours**	Nil
Prerequisites (if any)	None	**Course Type**	Theory and Practical

Course Objective:

1. To provide essential knowledge on physical activity, health, and wellness.
2. To ensure students understand body systems, exercise principles, nutrition, mental health, and disease management.
3. To educate students on the benefits of yoga, the risks of substance abuse and basic first aid skills.
4. To equip students with the ability to lead healthier lifestyles.
5. To enable students to design effective and personalized exercise programs.

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Human Body Systems related to Physical activity and its functions: Respiratory System - Cardiovascular System. Musculoskeletal System and the Major Muscle groups of the Human Body. Quantifying Physical Activity Energy Expenditure and Metabolic equivalent of task (MET) Exercise Continuum: Light-intensity physical activity, Moderate - intensity physical activity, Vigorous -intensity physical activity. Defining Physical Activity, Aerobic Physical Activity, Anaerobic Physical Activity, Exercise and Health-Related Physical Fitness. FITT principle to design an Exercise programme Components of Health-related Physical Fitness: - Cardiorespiratory Fitness- Muscular strength- Muscular endurance- Flexibility- Body composition.	4

2	Concept of Health and Wellness: Health and wellness differentiation, Factors affecting health and wellness. Mental health and Factors affecting mental health. Sports and Socialization: Sports and character building - Leadership through Physical Activity and Sports	2
	Diet and nutrition: Exploring Micro and Macronutrients: Concept of Balanced diet Carbohydrate & the Glycemic Index Animal & Plant - based Proteins and their Effects on Human Health Dietary Fats & their Effects on Human Health Essential Vitamins and Minerals	
3	Lifestyle management strategies to prevent / manage common hypokinetic diseases and disorders - Obesity - cardiovascular diseases (e.g., coronary artery disease, hypertension) - Diabetes - Osteoporosis - Musculoskeletal disorders (e.g., osteoarthritis, Low back pain, Kyphosis, lordosis, flat foot, Knock knee) Meaning, Aims and objectives of yoga - Classification and importance of of Yogic Asanas (Sitting, Standing, lying) Pranayama and Its Types - Active Lifestyle and Stress Management Through Yoga Understanding on substance abuse and addiction - Psychoactive substances & its ill effects- Alcohol- Opioids- Cannabis -Sedative - Cocaine -Other stimulants, including caffeine -Hallucinogens - Tobacco -Volatile solvents.	4
4	First aid and principles of First Aid: Primary survey: ABC (Airway, Breathing, Circulation). Qualities of a Good First Aider First aid measures for: - Cuts and scrapes - Bruises - Sprains - Strains - Fractures - Burns - Nosebleeds. First Aid Procedures: Cardiopulmonary Resuscitation (CPR) - Heimlich Maneuver - Applying a sling Sports injuries: Classification (Soft Tissue Injuries - Abrasion, Contusion, Laceration, Incision, Sprain & Strain)	2

Additional Topics

- Need and Importance of Physical Education and its relevance in interdisciplinary context. Understanding of the Endocrine System
- Developing a fitness profile
- Healthy foods habits for prevention and progression of Lifestyle Diseases. Processed foods and unhealthy eating habits.
- Depression - Anxiety - Stress
- Different ways of carrying an injured person. Usage of Automated external defibrillator

Course Assessment Method

(CIE: 40 Marks)

Continuous Internal Evaluation Marks (CIE):

Activity Evaluation	Case Study/Micro project/Presentation	Total
25	25	**50**

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Explain the different human body systems and describe various types of physical activities along with methods to measure and quantify these Activities	2
CO2	Explain how to maintain or improve health and wellness through psychological practices, dietary habits, and sports activities.	2
CO3	Discuss about common hypokinetic disorders and musculoskeletal disorders, and describe the importance of leading a healthy lifestyle through the practice of yoga and abstaining from addictive substances.	2
CO4	Explain the basics of first aid and describe common sports injuries	2
CO5	Demonstrate endurance through physical activity	3

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	1													
CO2	1						1							
CO3	1		3											
CO4	1						1							
CO5	1		3					3	3					

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Foundations of Nutrition	Bhavana Sabarwal	Commonwealth Publishers	1999
2	Anatomy and physiology in	Ross and Wilson	Waugh, A.,	2022

	health and illness.		& Grant, A.	

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Fit to be Well Essential Concept	Thygerson, A. L., Thygerson, S. M., & Thygerson, J. S.	Jones & Bartlett Learning.	2018
2	Introduction to physical education, fitness, and sport	Siedentop, D., & Van der Mars, H.	Human kinetics.	2022
3	Substance Use Disorders. Manual for Physicians.	Lal, R., & Ambekar, A. (2005).	National Drug Dependence Treatment Centre, New Delhi	2005
4	The exercise health connection- how to reduce your risk of disease and other illnesses by making exercise your medicine.	Nieman, D. C., & White, J. A	Public Health	1998
5	ACSM's resource manual for guidelines for exercise testing and prescription.	Lippincott Williams & Wilkins.	American College of Sports Medicine.	2012
6	Exercise Physiology: energy, nutrition and human performance.	Katch, F. I., Katch, V. L., & McArdle, W. D.	Lippincott Williams & Wilkins	2010

<u>Continuous Internal Evaluation Marks (CIE): for the Health and Wellness Course</u>

Students will be evaluated as follows,

Title	Method of Evaluation

Activity Evaluation	It will be evaluated based on the Fitness Protocols and Guidelines for ages 18+ to 65 years, as set forth by FIT India. Measurements will be taken for all the tests of the FIT India Fitness Protocol and the evaluation will be based on the benchmark score received for the following tests: 1. V Sit Reach Test 2. Partial Curl Up - 30 seconds 3. Push Ups (Male) and Modified Push Up (Female) 4. Two (2) Km Run/Walk Students who achieve a total benchmark score of 8 across the aforementioned 4 tests will be awarded pass marks for activity evaluation. Students who score better will be awarded a maximum mark of 20.
Case Study/Micro project/Presentation	Case studies will be given to students to assess their understanding of the subjects taught. Students will be required to make presentations on the subjects taught in class, and their understanding of the subjects will be assessed. Based on the case studies, micro projects, and Presentations the students will be awarded marks out of 30.
Activity Evaluation – Special Circumstances	Physically challenged and medically unfit students can opt for an objective test to demonstrate their knowledge of the subjects taught. Based on their performance in the objective test, they will be awarded marks out of 20.
Activity Evaluation - Special Considerations - NCC	Students who enrolled themselves in the NCC during the course period (between the start and end dates of the program) and attended 5 college level parades will be awarded pass marks for activity evaluation. Students who attend more parades will be eligible for a maximum mark of 20 based on their parade attendance.