



D. Y. Patil Education Society's

**D. Y. Patil Technical Campus
Faculty of Engineering & Faculty of Management
Talsande**

(An Autonomous Institute)

Approved by AICTE and Affiliated to Shivaji University, Kolhapur

(Accredited by NAAC 'A' Grade with 3.25 CGPA in First Cycle)

Curriculum Structure

With Effective from Academic Year 2024-25

LIST OF ABBREVIATIONS

Sr. No	Abbreviations	Courses
1	BSC	Basic Science Course
2	ESC	Engineering Science Course
3	PCC	Programme Core Course
4	PEC	Programme Elective Course
5	MDM	Multidisciplinary Minor
6	OE	Open Elective
7	VSEC	Vocational and Skill Enhancement Course
8	AEC	Ability Enhancement Course
9	HSSM	Humanities Social Science and Management
10	IKS	Indian Knowledge System
11	VEC	Value Education Course
12	FP	Field Project
13	ELC	Experiential Learning Courses
14	CC	Co-curricular Courses
15	MC	Mandatory Course
16	ISE	In Semester Evaluation
17	MSE	Mid Semester Examination
18	CA	Continuous Assessment
19	POE	Practical Oral Examination
20	ESE	END Semester Examination

CURRICULUM FRAMEWORK

The Course and Credit Distribution

Sr. No	Type of Course	No. of Courses		Total No. Credit	
		Sem I	Sem II	Sem I	Sem II
1	Basic Science Course (BSC)	2	2	8	8
2	Engineering Science Course (ESC)	2	1	8	5
3	Programme Core Course (PCC)		1		2
4	Programme Elective Course (PEC)				
5	Multidisciplinary Minor (MDM)				
6	Open Elective (OE)				
7	Vocational and Skill Enhancement Course (VSEC)	1	1	2	2
8	Ability Enhancement Course (AEC)		1		1
9	Humanities Social Science and Management (HSSM)				
10	Indian Knowledge System (IKS)	1		2	
11	Value Education Course (VEC)				
12	Field Project (FP)				
13	Experiential Learning Courses (ELC)				
14	Co-curricular Courses (CC)	1	1	2	2
15	Mandatory Course (MC)				
Total		7	7	22	20

Semester wise Course Distribution										
Sr. No	Course Category	Number of Courses per Semester								Total
		1	2	3	4	5	6	7	8	
1	Basic Science Course (BSC)	2	2							4
2	Engineering Science Course (ESC)	2	1							3
3	Programme Core Course (PCC)		1	3	3	3	3	2	2	17
4	Programme Elective Course (PEC)					1	2	2	1	6
5	Multidisciplinary Minor (MDM)			1	1	1	1	1	1	6
6	Open Elective (OE)			1	1	1				3
7	Vocational and Skill Enhancement Course (VSEC)	1	1		1		1			4
8	Ability Enhancement Course (AEC)		1		1					2
9	Entrepreneurship Management Courses			1	1					2
10	Indian Knowledge System (IKS)	1								1
11	Value Education Course (VEC)			1	1					2
12	Research Methodology							1		1
13	Field Project (FP)			1						1
14	Project							1		1
15	Internship								1	1
16	Co-curricular Courses (CC)	1	1							2
Total		7	7	8	9	6	7	7	5	56

CREDIT DISTRIBUTION : SEMESTER WISE										Total	Total Credits GR
1 Lecture hour = 1 Credit 2 Lab Hours = 1 Credit 1 Tutorial Hour = 1 Credit											
Sr. No	Type of Course	No of Credits/ Semester									
		1	2	3	4	5	6	7	8		
1	Basic Science Course (BSC)	8	8							16	14-18
2	Engineering Science Course (ESC)	8	5							13	16-12
3	Programme Core Course (PCC)		2	10	10	12	10	6	4	54	44-56
4	Programme Elective Course (PEC)					4	8	2	6	20	20
5	Multidisciplinary Minor (MDM)			2	2	4	2	2	2	14	14
6	Open Elective (OE)			4	2	2				8	8
7	Vocational and Skill Enhancement Course (VSEC)	2	2		2		2			7	8
8	Ability Enhancement Course (AEC)		1							4	4
9	Humanities Social Science and Management (HSSM)			2	2					4	4
10	Indian Knowledge System (IKS)	2								2	2
11	Value Education Course (VEC)			2	2					4	4
12	Research Methodology								4	4	4
13	Field Project			2						2	2
14	Project								4	4	4
15	Internship							12		12	12
16	Co-curricular Courses (CC)	2	2							4	4
Total		22	20	22	22	22	22	22	20	172	160-176



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**Department of Computer Science and Engineering -
Data Science**

Curriculum Structure

First Year Computer Science and Engineering - Data Science Program

(Course 2024-25)

With Effective from Academic Year 2024-25

Curriculum Structure

First Year

**Computer Science and Engineering –
Data Science**

Programme: - Computer Science and Engineering –Data Science

Semester - I

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Course Credits	EXAM SCHEME					TOTAL
								ISE	MSE	ESE	INT		
1	BSC	AS24FE111	Algebra and Statistics	3	1	-	4	20	30	50	25	125	
2		PHY24FE112	Applied Physics	3	-	-	3	20	30	50	-	100	
		PHY24FE112P	Applied Physics Laboratory	-	-	2	1	-	-	-	-	25	25
3	ESC	PSCL24FE113	Problem Solving with C-Language	3	-	-	3	20	30	50	-	100	
		PSCL24FE113P	Problem Solving with C-Language Laboratory	-	-	2	1	-	-	-	25	25	
		CNF24FE114	Computer and Network Fundamentals	3	-	-	3	20	30	50	-	100	
4		CNF24FE114P	Computer and Network Fundamentals Laboratory	-	-	2	1	-	-	-	25	25	
5	VSEC	DTTI24FE115	Design Thinking Through Innovation	1	-	-	1	25	-	-	-	25	
		DTTI24FE115P	Design Thinking Through Innovation Laboratory	-	-	2	1	-	-	-	25	25	
6	IKS	ITPA24FE116	Indian Town Planning and Architecture	2	-	-	2	20	-	30	-	50	
7	CCA	YOGA24FE117	Yoga	1	-	2	2	-	-	-	50	50	
Total				16	1	10	22	125	120	230	175	650	
Non Credit Mandatory Course													
8	MC	MC24FE118	Finishing School Training I	3	-	-	NC	-	-	-	Grade	Grade	
9		MC24FE119	Rural/ Social Internship	-	-	-	NC	-	-	-	Grade	Grade	

Note: This structure is approved by Academic Council in the meeting dated 03.09.2024

SCHEME OF INSTRUCTION & CURRICULUM

Programme: - Computer Science and Engineering –Data Science

Semester - II

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Course Credits	EXAM SCHEME				
								ISE	MSE	ESE	INT	TOTAL
1		DIC24FE121	Differential & Integral Calculus	3	1	-	4	20	30	50	25	125
2	BSC	CHEM24FE122	Applied Chemistry	3	-	-	3	20	30	50	-	100
		CHEM24FE122P	Applied Chemistry Laboratory	-	-	2	1	-	-	-	25	25
3	ESC	GENAI24FE123	Generative AI	3	-	-	3	20	30	50	-	100
		GENAI24FE123P	Generative AI Laboratory	-	-	2	1	-	-	-	25	25
4	PCC	DS24FE124	Data Structure	2	-	-	2	-	-	50	-	50
5	VSEC	PSD24FE125	Object Oriented Programming Skill Development	1	-	-	1	25	-	-	-	25
		PSD24FE125P	Object Oriented Programming Skill Development Laboratory	-	-	2	1	-	-	-	25	25
6	AEC	PC24FE126	Professional Communication	1	-	-	1	25	-	-	-	25
		PC24FE126P	Professional Communication Laboratory	-	-	2	1	-	-	-	25	25
6	CCA	NSS24FE127	NSS	1	-	2	2	-	-	-	50	50
Total				15	1	8	20	135	90	200	150	575
Non Credit Mandatory Course												
8	MC	MC24FE128	Finishing School Training II	3	-	-	NC	-	-	-	Grade	Grade
9		MC24FE129	Capstone Project	-	-	-	NC	-	-	-	Grade	Grade

Note: This structure is approved by Academic Council in the meeting dated 03.09.2024

Department of First Year Engineering
F. Y. B. Tech. Curriculum
(Programme- Computer Science and Engineering –Data Science)
w. e. f. A.Y. 2024-2025

Course Title : Linear Algebra and Statistics	
Course Code: AS24FE111	Semester: I
Teaching Scheme L-T-P : 3 – 1 – 0	Credits : 4
Evaluation Scheme: ISE-I (10 Marks), MSE (30 Marks), ISE-II (10 Marks)	ESE Marks : 50

Prior Knowledge of:	Matrices, Derivatives.
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Course Objectives:

1.	To teach mathematical methodology.
2.	To develop mathematical skills and enhance logical thinking power of students.
3.	To provide students with skills in Linear Algebra and Statistics.
4.	To imbibe graduates with mathematical knowledge, computational skills and the ability to deploy the skills effectively in solution of engineering problems.

Curriculum Details

Course Contents	Duration
Unit-I: Linear Algebra–I <ul style="list-style-type: none"> • Introduction to matrices, types of matrices • Rank of matrix by normal form and echelon form • Solution of simultaneous linear non-homogenous equations • Solution of simultaneous linear homogenous equations 	08 Hrs
Unit-II: Linear Algebra–II <ul style="list-style-type: none"> • Definition of linear combination of vectors • Dependence and independence of vectors • Eigen values and its properties. • Eigen vectors and its properties. • Cayley-Hamilton theorem (Without proof) 	07 Hrs
Unit-III Numerical Solutions of Linear Equations <ul style="list-style-type: none"> • Introduction • Gauss–Elimination method • Gauss–Jordan method • Gauss–Seidel method • Jacobi’s iterative method 	07 Hrs
Unit-IV : Probability Distribution <ul style="list-style-type: none"> • Random variables. • Discrete Probability distribution. • Continuous probability distribution. 	08 Hrs

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w. e. f. A.Y. 2024-2025

Course Contents	Duration
<ul style="list-style-type: none"> • Binomial Distribution. • Poisson Distribution. • Normal Distribution. 	
<p>Unit-V: Correlation and Regression and Fitting of Curves</p> <ul style="list-style-type: none"> • Introduction, Types of correlation, Karl Pearson’s coefficient of correlation • Interpretation of the coefficients of corrections • Computation of coefficient of correlation for ungroup data • Lines of regression • Calculations of equations of the lines of regression • Fit a first degree curve • Fit a second degree curve • Fit an exponential curve $y = a \cdot x^b$, $y = a \cdot b^x$ 	08 Hrs
<p>Unit-VI : Numerical Solutions of Algebraic & Transcendental equations</p> <ul style="list-style-type: none"> • Introduction of Algebraic and Transcendental equations • Bisection method • Newton-Raphson method • Regula-Falsi method • Secant method 	07 Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
1	understand matrices and apply such knowledge to solve linear system of equation and find eigen values and eigen vectors
2	use numerical methods to solve system of linear equation and to solve algebraic & transcendental equations.
3	solve basic problems in probability theory, including problems involving the binomial, Poisson, and normal distributions.
4	describe the statistical data numerically by using Lines of regression and Curve fittings.

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w. e. f. A.Y. 2024-2025

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	2, 3	3	3	3	-	-	-	-	-	-	-	-	-
2	3	3	3	3	-	-	-	-	-	-	-	-	-
3	3	2	2	2	-	-	-	-	-	-	-	-	-
4	3	2	2	2	-	-	-	-	-	-	-	-	-

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Advanced Engineering Mathematics	7th	Peter V.O' Neil	Cengage Learning	2012
2	Advanced Engineering Mathematics	1st	H.K.Dass	S. Chand Publications, New Delhi	2011
3	A Text Book of Applied Mathematics	7th	P.N.Wartikar, J.N.Wartikar	Vidyarthi Griha Prakashan, Pune.	2006
4	Higher Engineering Mathematics	36th	B.S.Grewal	Khanna Publishers	2001

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Advanced Engineering Mathematics	5th	Erwin Kreyszig	India Pvt., Ltd.	2014
2	Higher Engineering Mathematics	6th	B.V.Ramana	Tata M/cGraw – Hill Publication	2010
3	Numerical Methods for Scientific and Engineering Computation	5th	M.K.Jain	New Age International Pvt. Ltd New Delhi	2007
4	A Textbook of Engineering Mathematics	6th	N.P.Bali,Iyengar	Laxmi Publication	2004

Department of First Year Engineering
F. Y. B. Tech. Curriculum
(Programme- Computer Science and Engineering –Data Science)
w. e. f. A.Y. 2024-2025

Useful Link /Web Resources:

1. DELNET- <http://www.delnet.in>
2. NDL-<http://ndl.iitkgp.ac.in>
3. N-LIST- <http://www.nlist.inflib.ac.in>

List of Tutorials:

Tut. No	Title of Tutorials	Duration
01	Linear Algebra–I	01 Hr
02	Linear Algebra–I	01 Hr
03	Linear Algebra–II	01 Hr
04	Linear Algebra–II	01 Hr
05	Numerical Solutions of Linear Equations	01 Hr
06	Numerical Solutions of Linear Equations	01 Hr
07	Probability Distribution	01 Hr
08	Probability Distribution	01 Hr
09	Correlation and Regression	01 Hr
10	Correlation and Regression	01 Hr
11	Numerical Solutions of Algebraic & Transcendental equations	01 Hr
12	Numerical Solutions of Algebraic & Transcendental equations	01 Hr

Department of First Year Engineering
F. Y. B. Tech. Curriculum

(Programme - Computer Science and Engineering – Data Science) w. e. f. A.Y. 2024-2025

Course Title : Applied Physics	
Course Code: PHY24FE112	Semester: I
Teaching Scheme L-T-P : 3-0-0	Credits : 03
Evaluation Scheme: ISE-I (10 marks), MSE (30 marks), ISE-II (10 marks)	ESE Marks: 50

Prior Knowledge of:	Fundamentals of optics, semiconductors, nature of radiation, photo electric effect.
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Course Objectives:

1.	To provide basic concept of modern optics.
2.	To make the students grasp the working principles of LASER and its applications
3.	To expose electronic properties of materials for semiconductors from a quantum mechanical point of view and grasp the basics of transducers and their applications.
4	To understand the concepts of nanomaterials and quantum mechanics for their applications in engineering fields

• **Curriculum Details**

Course Contents	Duration
UNIT I: Diffraction and Polarization of Light Diffraction: <ul style="list-style-type: none"> • Diffraction- Concept and types (Fresnel and Fraunhofer diffraction), • Diffraction grating – construction and theory, • Resolving power of plane transmission grating. Polarization: <ul style="list-style-type: none"> • Introduction, double refraction, • Huygens’ theory (positive and negative crystals), • Optical Activity, Specific Rotation, • Laurent’s half shade polarimeter. 	7 Hrs
UNIT-II: Lasers and Fibre Optics Lasers: <ul style="list-style-type: none"> • Introduction to interaction of radiation with matter, • Coherence, • Principle and working of Laser, Population inversion, Pumping, • Types of Lasers: Ruby laser, He-Ne laser, • Applications of laser. Fibre Optics: <ul style="list-style-type: none"> • Introduction, Optical fibre as a dielectric wave guide, • Total internal reflection, Acceptance angle, Acceptance cone and Numerical 	7 Hrs

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(Programme - Computer Science and Engineering – Data Science) w. e. f. A.Y. 2024-2025

Course Contents	Duration
aperture, <ul style="list-style-type: none"> • Fibre optic communication system, • Applications of optical fibres. 	
UNIT-III: Semiconductor Physics <ul style="list-style-type: none"> • Intrinsic and Extrinsic semiconductors, • Dependence of Fermi level on carrier-concentration and temperature, • Carrier generation and recombination, • Carrier transport: diffusion and drift, • Hall effect, • p-n junction diode, Zener diode, and their V-I Characteristics. 	7 Hrs
UNIT-IV: Transducers: Transducers: For study Range, Specifications and Limitations of; <ul style="list-style-type: none"> • Displacement (LVDT), • Temperature (RTD), • Pressure (Strain Gauge), • Speed (Shaft Encoder), , Appliances: Operation of Appliances- <ul style="list-style-type: none"> • Digital Thermometer, • Weighing Machine, • Washing Machine, • Microwave Oven and • Tachometer. 	7 Hrs
UNIT-V: Nano Technology <ul style="list-style-type: none"> • Introduction to nanotechnology, nanoscience, nanomaterials, • Synthesis Method-Top-down Process: Ball milling method, • Synthesis Method-Bottom-up Approach: Colloidal method, • Tools- Scanning Tunneling Microscope and Atomic Force Microscope, • Applications of nanomaterials. 	7 Hrs
UNIT-VI: Quantum Mechanics <ul style="list-style-type: none"> • Introduction to quantum physics, • Black body radiation, Planck's law, Photoelectric effect, • Compton effect, • de-Broglie's hypothesis, • Wave-particle duality, • Heisenberg's Uncertainty principle, • Born's interpretation of the wave function, • Schrodinger's time independent wave equation. 	7 Hrs

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(Programme - Computer Science and Engineering – Data Science) w. e. f. A.Y. 2024-2025

Self-learning topics: Crystal structures, Optical fiber as sensors, CO2 LASER.

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
112.1	Describe the principle of diffraction and relate concepts in various engineering applications
112.2	Apply electronic properties of semiconductors, laser the working mechanism and applications of LASER and optical fiber
112.3	Explain the basic block diagram of transducers and need for nanomaterials in science and technology
112.4	Solve problems using principles of quantum mechanical phenomenon

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
112.1	3	3	3	3	-	-	-	-	-	-	-	-	-
112.2	3	2	2	2	-	-	-	-	-	-	-	-	-
112.3	2	3	3	3	-	-	-	-	-	-	-	-	-
112.4	3	2	2	2	-	-	-	-	-	-	-	-	-

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering Physics	1 st	H. K. Malik	Tata McGraw Hill Education	2019
2	A Text Book of Engineering Physics	Revised	M. N. Avadhanulu, P. G. Kshirasagar	S. Chand Publications	2018
3	Engineering Physics	Revised	L.N. Singh	Synergy Knowledge Ware	2016
4	Engineering Physics	Revised	V. Rajendran	Tata McGraw Hill Education	2010
5	Engineering Physics	1 st	R.K. Gaur, S.L. Gupta	Dhanpat Rai Publications	1993

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Fundamentals of Physics	Revised	J. Walker, D. Halliday, R. Resnick	Wiley Publications	2018
2	Engineering Physics	1 st	B.K. Pandey and Chaturvedi	Cengage learning Publications	2017
3	Nanotechnology- Principles & Practices	3 rd	Sulabha K. Kulkarni	Capital Publication Co. New Delhi	2014
4	Introduction to Solid State Physics	8 th	Charles Kittel	John Willey and Sons Inc.	2009
5	Solid State Physics	6 th	S.O.Pillai	New edge Internationals	2009

Useful Link /Web Resources:

1. DELNET- <http://www.delnet.in>
2. NDL-<http://ndl.iitkgp.ac.in>
3. N-LIST- <http://www.nlist.inflib.ac.in>
4. <http://hyperphysics.phy-astr.gsu.edu/hbase/index.html>
5. https://en.wikipedia.org/wiki/Wave_interference
6. https://en.wikipedia.org/wiki/Introduction_to_quantum_mechanics

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(Programme - Computer Science and Engineering – Data Science) w. e. f. A.Y. 2024-2025

Course Title: Applied Physics Laboratory	
Course Code : PHY24FE112P	Semester: I
Teaching Scheme: L-T-P: 0-0-2	Credit : 01
Evaluation Scheme: INT (25 marks)	ESE/POE/OE Marks: --

Prior Knowledge of:	Optics, semiconductor basics, graph plotting, slope calculation
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Course Objectives:

1	To make the students understand the physics concept for effective application in engineering and technology.
2	To use the knowledge of optics in a laboratory by using a spectrometer, diffraction grating, etc. for their use in different applications.

List of Experiments- Minimum 8 practical's need to perform from the following list

Exp. No	Title of Experiments	Duration
01	To study a Linear Variable Differential Transformer (LVDT) and use it in a simple experimental set up to measure a small displacement.	02 Hrs
02	To measure the stress & strain using strain gauges mounted on cantilever beam.	02 Hrs
03	Calculation of divergence of LASER beam.	02 Hrs
04	Determination of wavelength of LASER using diffraction grating.	02 Hrs
05	Wavelength of different spectral lines of mercury using grating.	02 Hrs
06	Calculation of R. P. of grating by using spectrometer.	02 Hrs
07	To find specific rotation by using half shaded Polarimeter.	02 Hrs
08	Verification of inverse square law of intensity of light.	02 Hrs
09	To find Resolving power of Telescope	02 Hrs
10	Measurement of band gap energy of semiconductor.	02 Hrs
11	To study the forward and reverse characteristics of P-N junction diode.	02 Hrs
12	Zener Diode as Voltage Regulator	02 Hrs
13	To study Hall effect in semiconductors and measure the Hall coefficient.	02 Hrs

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Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
112.1	Interpret knowledge related to optics to use for suitable purposes in applied physics
112.2	Identify band theory of semiconductor in terms of energy and carrier concentration
112.3	Explain different types of crystal structure and their characteristics.
112.4	Interpret knowledge related to LASER for suitable purposes in applied physics

Course Articulation Matrix: Mapping of Course Outcomes (Cos) with Program Outcomes (PO's)

CO's \ PO's	PO's													
	BTL	1	2	3	4	5	6	7	8	9	10	11	12	
112.1	3	3	3	3	-	-	-	-	-	3	-	-	-	
112.2	2	3	3	3	-	-	-	-	-	3	-	-	-	
112.3	2	3	3	3	-	-	-	-	-	3	-	-	-	
112.4	3	3	3	3	-	-	-	-	-	3	-	-	-	

Suggested Learning Resources: --

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering Physics	1 st	H.K. Malik	Tata McGraw Hill Education	2019
2	A Text Book of Engineering Physics	Revised	M. N. Avadhanulu, P. G. Kshirasagar	S. Chand Publications	2018
3	Engineering Physics	Revised	L. N. Singh	Synergy Knowledge Ware	2016
4	Engineering Physics	Revised	V. Rajendran	Tata McGraw Hill Education	2010
5	Engineering Physics	1 st	R.K. Gaur, S.L. Gupta	Dhanpat Rai Publications	1993

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Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Fundamentals of Physics	Revised	J.Walker, D.Halliday, R.Resnick	Wiley Publication	2018
2	Engineering Physics	1 st	B.K. Pandey and Chaturvedi	Cengage Learning Publications	2017
3	Nanotechnology- Principles & Practices	3 rd	Sulabha K. Kulkarni	Capital Publication Co. New Delhi	2014
4	Introduction to Solid State Physics	8 th	C.Kittel	John Willey and Sons Inc.	2009
5	Solid State Physics	6 th	S.O.Pillai	New edge Internationals,	2009

Useful Link /Web Resources:

1. <https://vlab.amrita.edu/?sub=1>
2. <http://vlabs.iitb.ac.in/vlab/labsps.html>

Course Title :- Problem Solving with C-Language	
Course Code:- PSCL24FE113	Semester:- Semester-I
Teaching Scheme L-T-P : 03-00-00	Credits :3
Evaluation Scheme: ISE-I (10Marks), ISE-II (10Marks), MSE (30Marks)	ESE Marks: 50 marks

Prior Knowledge of:	Basic Knowledge of Computers
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Course Objectives:

1.	Understand working principles of programming languages
2.	Demonstrate use of decision and repetition structure in order to solve specific problem
3.	Use of modular approach for problem solving
4.	Understand the basics of pointers

Curriculum Details:

Course Contents	Duration
Unit-I Introduction to C <ul style="list-style-type: none"> • Evolution of “C” • Feature of “C” • Structure of C Program • Compilation and Execution • Data Types – user defined • pre-defined, Variables, Constants • reading and printing variable values • Preprocessor Directive 	08 Hrs
Unit-II Operators in C <ul style="list-style-type: none"> • Arithmetic Operators • Relational Operators • Logical Operators • Unary Operators • Bitwise Operators • Ternary Operator • sizeof operator 	07 Hrs
Unit-III Control Flow Statements & Blocks <ul style="list-style-type: none"> • Decision Controls • If-else statements • Switch Case • Loops – for loop • while loop • do – while loop • Loop interruption – break, continue, exit functions 	08 Hrs
Unit-IV Functions	08 Hrs

Course Contents	Duration
<ul style="list-style-type: none"> • Fundamentals of function – function declaration and prototype • Function definition • Function call • Return type and return statement • Function arguments • Scope of Variables in function • Variable storage classes • Storage classes – Automatic, Static, Register, External 	
Unit-V Arrays <ul style="list-style-type: none"> • Single Dimensional Array • Multi-Dimensional Array • Character Array • Strings • Built in String functions -strcat, strcmp, strcpy, strlen, strcmp 	06 Hrs
Unit-VI Pointers <ul style="list-style-type: none"> • Address & Dereferencing • Pointer Type Declaration • Pointer Initialization • Pointer Assignment • Pointer Arithmetic • Pointer Comparison • Pointer & Functions – Passing Pointer to function, pass by value, pass by reference • Pointer to array 	08 Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
1	Explain features of "C" programming language.
2	Select appropriate operators in programming expressions for implementing simple C-Programs.
3	Explain Decision Making, Branching statements and looping statements for implementing Programs.
4	Model a given big problem statement in to smaller parts to provide modular approach.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	1	3	3	3	-	-	-	-	-	-	-	-	-
2	2	3	3	3	2	2	-	-	-	-	-	-	-
3	2	3	3	3	2	2	-	-	-	-	-	-	-
4	2	3	3	3	2	2	-	-	-	-	-	-	-

Strongly Contribution: 3 Moderate Contribution: 2 Weak Contribution: 1 No Contribution--

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	The Complete Reference	4 th	Herbert Schildt	McGraw-Hill Education	2017
2	“C” Programming Language	2 nd	Brian Kernighan, Dennis Ritchie	PHI Learning	2011

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Practical “C” Programming	3 rd	Steve Oualline	Oreilly	2013
2	Programming in ANSI C	8 th	E. Balagurusamy	McGraw Hill Education	2019

Useful Link /Web Resources:

1. DELNET- <http://www.delnet.in>
2. NDL-<http://ndl.iitkgp.ac.in>
3. N-LIST- <http://www.nlist.inflib.ac.in>

Course Title : -- Problem Solving with C-Language Laboratory	
Course Code: - PSCL24FE113P	Semester: - Semester-I
Teaching Scheme L-T-P : - 00-00-02	Credits : 1
Evaluation Scheme: INT- 50 Marks	ESE/POE/OE Marks: -

Prior Knowledge of:	Basic Knowledge of Computers
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Course Objectives:

1.	Apply concepts of variable, constants, input and output streams for developing interactive programs.
2.	Develop a solution using loops and conditional statements
3.	Design solution using arrays.
4.	Develop an optimized solution for large problem using concept of function and pointer.

List of Experiments-

Exp. No	Title of Experiments	Duration
01	To study variables and constants in "C" Practical/Experimentation: <ul style="list-style-type: none"> Declare and initialize variables and constant using assignment statement and scanf function Use printf function to display the variables – (data type formatting) 	02 Hrs
02	To Study arithmetic operators in "C" <ul style="list-style-type: none"> Develop program to use arithmetic operators 	02 Hrs
03	To Study logical operators and Conditional Execution <ul style="list-style-type: none"> Develop program to test conditional execution of the code –If else, else if, nested if else, else if ladder, switch 	02 Hrs
04	To Study Iterative Execution <ul style="list-style-type: none"> Develop program to test iterative execution of the code – while, do-while and for 	02 Hrs
05	To Study functions in "C" <ul style="list-style-type: none"> Develop function which accepts argument, process the argument and return the result – eg. Addition function accepts two numbers, performs addition and returns the result 	02 Hrs
06	To Study Arrays in "C" <ul style="list-style-type: none"> Develop a function which accepts a integer array and print the array Develop a function which accepts a integer array, perform arithmetic operation on array 	02 Hrs
07	To Study String and String Functions in "C" <ul style="list-style-type: none"> Develop a program which accepts a character array, string as input and display it Develop a program demonstrating various string functions [e.g. strlen(), strcpy(), strcat(), strcmp()] 	02 Hrs
08	To Study Multi-Dimensional Array <ul style="list-style-type: none"> Implement Matrix Addition using 2D array. Implement Matrix Multiplication using 2D array. 	02 Hrs
09	To Study Pointers in "C"	02 Hrs

Exp. No	Title of Experiments	Duration
	<ul style="list-style-type: none"> Develop a function to accept array argument using pointer, modify and display contents of the array using pointer 	
10	To Study Pointers in "C" <ul style="list-style-type: none"> Pass integer variables using – pass by value and pass by reference concept Modify the values and test the effect on the variables by printing values in the function and main method 	02 Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
1	Use of variable, constants, input and output streams for developing interactive programs.
2	Writing control flow statement using C Programming.
3	Develop C program using array and function.
4	Develop C program solution for given problem using pointers.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	1	3	3	3	-	-	-	-	-	-	-	-	-
2	2	3	3	3	2	2	-	-	-	-	-	-	-
3	2	3	3	3	2	2	-	-	-	-	-	-	-
4	2	3	3	3	2	2	-	-	-	-	-	-	-

Strongly Contribution: 3 Moderate Contribution: 2 Weak Contribution: 1 No Contribution--

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	The Complete Reference	4 th	Herbert Schildt	McGraw-Hill Education	2017
2	"C" Programming Language	2 nd	Brian Kernighan, Dennis Ritchie	PHI Learning	2011

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Practical "C" Programming	3 rd	Steve Oualline	Oreilly	2013
2	Programming in ANSI C	8 th	E. Balagurusamy	McGraw Hill Education	2019

Useful Link /Web Resources:

1. DELNET- <http://www.delnet.in>
2. NDL-<http://ndl.iitkgp.ac.in>
3. N-LIST- <http://www.nlist.inflib.ac.in>

Course Title :- Computer and Network Fundamentals	
Course Code:- CNF24FE114	Semester:- I
Teaching Scheme L-T-P : 3-0-0	Credits : 3
Evaluation Scheme: ISE-I (10 Marks), MSE (30 Marks), ISE-II (10 Marks)	ESE Marks: 50 marks

Prior Knowledge of:	-
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Course Objectives:

1	To perceive knowledge of the I/O Devices, Hardware, Software and networking.
2	To use software, hardware and networking
3	To perceive knowledge of OSI reference model

Curriculum Details

Course Contents	Duration
Unit-I Introduction <ul style="list-style-type: none"> • What is Computer? • Evolution of computer • Overview of computer hardware and its importance • Basic components of a computer system • Interaction between hardware and software for I/O operations • Role of hardware in the execution of programs • Fundamentals of Operating Systems 	6 Hrs
Unit-II CPU Architecture & Memory Hierarchy <ul style="list-style-type: none"> • CPU components and their functions • Instruction Set Architecture (ISA) • CPU organization and operation • Types of memory: RAM, ROM, cache, virtual memory • Memory management and addressing • Memory hierarchy in modern computer systems 	8 Hrs
Unit-III Motherboard and Storage Devices and display devices <ul style="list-style-type: none"> • Anatomy of a motherboard • Understanding expansion slots and connectors • Installing and configuring hardware components • Hard disk drives (HDDs) and Solid-State Drives (SSDs) • Optical drives and other storage media • Graphics cards and their components • Display technologies: CRT, LCD, LED 	8 Hrs
Unit-IV Basics of Networking <ul style="list-style-type: none"> • Components of data communication: Transmitter, Receiver, medium, message and protocol • Protocol standards • Bandwidth, data transmission rate, bound rate and bits per second • Modes of communication (simplex, half duplex, full duplex) 	8 Hrs

Course Contents	Duration
<ul style="list-style-type: none"> Introduction to LAN, WAN, MAN Network architecture: peer to peer, client server network 	
Unit-V Transmission Media and Network Topologies & Communication media <ul style="list-style-type: none"> Guided Transmission Media: Twisted Pair Cable, Coaxial Cable, Fiber optic Cable Unguided Transmission Media: Radio Waves, Microwaves, Infrared, Satellite Network Connecting Device: Hub, Switch, Router, Repeater, Bridge, Gateway Modem Network Topologies: Introduction, Definition Types of topology- Bus, Ring, Star, Mesh, Tree, Hybrid 	8 Hrs
Unit-VI OSI Reference Model <ul style="list-style-type: none"> Layered Architecture, Peer-to-Peer Processes – Interfaces between Layer Protocols Organization of the Layer Encapsulation Layers of OSI Reference Model (Functions and features of each Layer)- Physical layer, Data-Link layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer 	7 Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
1	Perceive knowledge of the I/O Devices, Hardware and Software, Networking.
2	Identify the functioning of data communication and computer network
3	Perceive knowledge of the relevant transmission media
4	Identify the functions of and features of given layer of OSI reference model

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	2	2	1	-	-	-	-	-	-	-	-	-	-
2	2	3	3	1	-	3	-	-	-	-	-	-	-
3	2	1	2	-	-	2	-	-	-	-	-	-	-
4	2	2	1	1	-	2	-	-	-	-	-	-	-

Strongly Contribution: 3 Moderate Contribution: 2 Weak Contribution: 1 No Contribution: -

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	The computer hardware installation, interfacing, troubleshooting and maintenance		James, K.L.	PHI Learning	
2	Comdex: Hardware and Networking Course Kit		Gupta, Vikas	Dreamtech Press	
3	PC Hardware Complete reference		Tata McGraw-Hill	Criage Zacker and John Rourke	

Sr. No	Title	Edition	Author(s)	Publisher	Year
4	Data communication and Networking	4th/5th	Behrouz A. Forouzan	Tata McGraw-Hill	
5	Computer Networks		A S Tanenbaum	Pearson Education	

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	The Complete PC Upgrade And maintenance Guide		Minasi, Mark	BPB Publication	
2	Computer Architecture and Maintenance		Kadam, Sachin	Shroff Publication	
3	Computer Networks: A Top-Down Approach		Behrouz A. Forouzan, Firouz Mosharraf	Tata McGraw-Hill Education	

Useful Link /Web Resources:

1. DELNET- <http://www.delnet.in>
2. NDL-<http://ndl.iitkgp.ac.in>
3. <https://nptel.ac.in/courses/106/105/106105082/>
3. <https://edu.gcfglobal.org/en/computerbasics/keeping-your-computer-clean/1/#>
4. <https://www.javatpoint.com/hardware>

Course Title: Computer and Network Fundamentals Laboratory	
Course Code : CNF24FE114P	Semester: I
Teaching Scheme: L-T-P: 0-0-2	Credit : 1
Evaluation Scheme: INT: 25 Marks	ESE/POE/OE Marks: -

Prior Knowledge of:	--
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Course Objectives:

1.	To identify and describe the basic components of a computer system
2.	To Analyze different hardware and software before acquiring
3.	To analyze the functioning of data communication and computer network.
4.	To select relevant transmission media and switching techniques as per need.

List of Experiments-

Exp. No	Title of Experiments	Duration
01	To familiarize students with the basic components of a computer system- CPU, motherboard, RAM, storage device, etc.	2 Hrs
02	To understand the interaction between hardware and software for I/O operations- Simple I/O operation, such as reading input from the keyboard, hardware components involved in the process.	2 Hrs
03	To understand the components and functions of a CPU- Internal components, such as ALU, control unit, and registers. Function of each component and how they work together to execute instructions	2 Hrs
04	To explore the performance of different levels of memory hierarchy- Use a benchmarking tool to measure the access time of RAM, cache, and virtual memory.	2 Hrs
05	To compare different display technologies- Observe and compare the image quality, resolution, and power consumption, advantages- disadvantages of CRT, LCD, LED etc.	2 Hrs
06	To introduce students to the fundamentals of operating systems. Install operating system.	2 Hrs
07	To set up a simple LAN and understand basic networking components.	2 Hrs
08	Configure Peer-to-Peer Network with at least three hosts.	2 Hrs
09	To create desired standard network cable including cross cable and test by using cable tester.	2 Hrs
10	To understand the role of ports and protocols in networking- Different network protocols (TCP, UDP) and port numbers.	2 Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
1	Identify and describe the basic components of a computer system (CPU, motherboard, RAM, storage devices, etc.)
2	Analyze different hardware and software before acquiring
3	Analyze the functioning of data communication and computer network
4	Select relevant transmission media and switching techniques as per need

Course Articulation Matrix: Mapping of Course Outcomes (Cos) with Program Outcomes (PO's)

PO's CO's	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	2	1	3	-	-	-	-	-	-	-	-	-	-
2	4	2	3	1	-	1	-	-	-	-	-	-	-
3	4	3	3	-	2	-	-	-	-	-	-	-	-
4	3	3	3	2	-	1	-	-	-	-	-	-	-

Strongly Contribution: 3 Moderate Contribution: 2 Weak Contribution: 1 No Contribution: 1

Suggested Learning Resources: --

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	The computer hardware installation, interfacing, troubleshooting and maintenance		James, K.L.	PHI Learning	
2	Data communication and Networking	4th/5th	Behrouz A. Forouzan	Tata McGraw-Hill	

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	The Complete PC Upgrade And maintenance Guide		Minasi, Mark	BPB Publication	
2	Computer Networks: A Top-Down Approach		Behrouz A. Forouzan, Firouz Mosharraf	Tata McGraw-Hill Education	

Useful Link /Web Resources:

- <https://www.javatpoint.com/hardware>
- <https://edu.gcfglobal.org/en/computerbasics/keeping-your-computer-clean/1/#>
- www.nptelvideos.in/2012/11/data-communication.html

Course Title : Design Thinking Through Innovation	
Course Code:- DTTI24FE115	Semester: I
Teaching Scheme L-T-P : 1-0-0	Credits : 01
Evaluation Scheme:- ISE 25	ESE Marks (50 marks) : --

Prior Knowledge of:	The Design Thinking & Innovations subject aim at providing students with the tools and exposure to be able to address problems using the design thinking process. The curriculum for “Design Thinking through Innovations” structured in such a way students learn to acquire both knowledge of design and practice of skills required to develop an attitude towards design. Being of the exemplary kinds, it focuses more on hands-on knowledge, learnt by doing and acting upon challenges discovered within the community and surroundings.
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Course Objectives:

1.	To Familiarize with Engineering Design Process and The basics of Design Thinking
2.	To Bring Awareness on Idea Generation to Solve the Problems
3.	To Familiarize with the various types of prototype and the techniques used for prototyping.

Curriculum Details

Course Contents	Duration
<p>Unit I: Engineering Design, Design Thinking and Idea Generation</p> <ul style="list-style-type: none"> • Introduction ,Key Concepts of Design, A Simplified Process of Engineering Design • What is Design Thinking? - Its Importance, Socio-Economical Relevance, Principles, Origin, Process of Design Thinking, Relevance of Design and Design Thinking in Engineering • Introduction to Idea Generation, Idea Generation Techniques, Processes, Define the Problem, Needs v/s Wants, Identify Philosophy, Problem Solving Tools, Case Studies • Critical thinking: Fundamentals, Characteristics, Critical v/s Ordinary Thinking. • Critical thinking skills- linking ideas, structuring arguments, five pillars of critical thinking. 	<p>07Hrs</p>
<p>Unit II: Prototyping and Tools for Design -Innovation</p> <ul style="list-style-type: none"> • Prototyping: Introduction, Need, Process, Types, Fidelity for prototypes, Minimum Usable Prototype [MUP] – Concept, challenges, etc. • Prototyping for Digital &Physical products: Concept, What is unique in Digital and Physical Prototypes? • Digital & Physical prototypes: Preparation; testing prototypes with users. • Introduction to Different tools used for design and Innovation, such as Hand Saw (Wood, PVC, CPVC and Steel),Component cutter, Spanners, Allen key & Wrench (Flat, Ring, Adjustable), Solder Gun, Component cutter, Tweezer, Multimeter, Glue Gun, Hex saw, Cutter, Wire Stripper. 	<p>07Hrs</p>

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
115.1	Learn Structured Approach of Engineering Design and the Relevance of Design and Design Thinking in Engineering & Understand Idea Generation Techniques to find out solutions to the Problems.
115.2	Understand the various types of prototype and Inculcate the techniques used for prototyping.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	1	3	1	0	2	1							
2	2	3	2	2	2	1							

Suggested Learning Resources:

Text Books:

Sr. No	Title	Author(s)	Publisher	Year
1.	Introduction to Design Thinking	S.Salivahanan, S.Suresh Kumar, D.Praveen Sam	Tata Mc Graw Hill, First Edition	2019
2.	The Design Thinking Playbook	Michael Lewrick	Wiley	2019
3.	Prototyping for Designers: Developing the best Digital and Physical Products	Kathryn McElroy	O'Reilly	2017
4.	"Design Thinking: Understand – Improve– Apply"	Hasso Plattner, Christoph Meine and Larry Leifer (eds)	Springer	2011

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1.	Design Thinking – New Product Essentials from PDMA	1 st	Michael G. Luchs, Scott Swan , Abbie Griffin	Wiley	2015
2.	101 Design Methods: A Structured Approach for Driving Innovation in Your Organization	1 st	Vijay Kumar	Wiley	2012

Useful Link /Web Resources:

Sr. No.	Online Resource Link	Source
1	Introduction to Design Thinking - Course (swayam2.ac.in) Design Thinking Full Course Design Thinking Process Design Thinking For Beginners Simplilearn - YouTube	Swayam (NPTEL)&YouTube
2	Thinking at IDEO - Insight, innovation, & a healthy dose of play	IDEO
3	INTRO (youtube.com)	YouTube
4	The Power of an Entrepreneurial Mindset Bill Roche TEDxLangleyED (youtube.com)	YouTube
5	https://www.ideo.com/pages/design-thinking	IDEO U
6	https://dschool.stanford.edu/	Stanford D school
7	https://www.designthinkersacademy.com/usa/	Design Thinking Institute
8	https://www.ibm.com/design/thinking/page/toolkit	Design thinking Tool Kit
9	https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo	

Course Title: Design Thinking Through Innovation Lab	
Course Code : DTTI24FE115P	Semester: I
Teaching Scheme: L-T-P: 0-0-1	Credit : 1
Evaluation Scheme: INT 25 marks	ESE/POE/OE Marks: --

Prior Knowledge of:	The Design Thinking & Innovations subject aim at providing students with the tools and exposure to be able to address problems using the design thinking process. Design Thinking & Innovations is designed in such a way students learn to acquire both knowledge of design and practice of skills required to develop an attitude towards design. Being of the exemplary kinds, it focuses more on hands-on knowledge, learnt by doing and acting upon challenges discovered within the community and surroundings.
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Course Objectives:

1.	To Discuss Various Techniques of Idea Generation.
2.	To Explain the Various Tools Used for Innovation.
3.	To Discuss the Methods of Implementing Design Thinking in The Real World.
4.	To Discuss the Implementation of Creativity and Innovation.

List of Experiments-

Exp. No	Title of Experiments	Duration (Hrs)
01	Overview of Design Thinking: Ethical Design and Critiques, Generation of “IDEA”, Problem Identification and Exercises.	2
02	Brainstorming Sessions to Find out Solution for Identified Problems	2
03	Prototyping and Modelling Challenge, Various Tools and Methodology Used for the Prototyping.	2
04	Hands-On Demonstration of Different Tools used for Design & Innovation.	2
05	Hands-On Demonstration of Soldering Machine, Function and Purpose of Soldering Machine.	2
06	Explanation and Usage of Joining & Insulation Tools and Technics.	2
07*	Assembly and Disassembly of Two Wheel Drive Robot Based Vehicle.	4
08	Micro Project: Group Formation and Idea Generation.	2
09	Creation of Prototype and Innovative Solution.	4
10	Test and Evaluation of Prototype.	2
11	Report Drafting - Instructions & Practices.	2
12	Presentation & Exhibition.	4

***Experiment- Mechanical: Assembly and Disassembly of Two Wheel Drive Robot Based Vehicle.**

Perform minimum 8 experiments out of the above 12 experiment.

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
115P.1	Learn Structured Approach of Engineering Design and the Relevance of Design and Design Thinking in Engineering & Understand Idea Generation Techniques to find out solutions to the Problems.
115P.2	Understand the various types of prototype and Inculcate the techniques used for prototyping.

Course Articulation Matrix: Mapping of Course Outcomes (Cos) with Program Outcomes (PO's)

PO's COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
1	1	3	1	0	2	1							
2	2	3	2	2	2	1							

Suggested Learning Resources: --

Reference Books:

Sr. no.	Name of Book	Author	Year
1.	Design Thinking: Understand-Improve-Apply	S. G. Blank	2007
2.	Design Thinking for Innovation Research and Practice	Walter Brenner, Falk Uebernickel, Springer	2016
3.	Business Design Thinking and Doing: Frameworks, Strategies and Techniques for Sustainable Innovation	Angele M. Beausoleil	2022

Useful Link /Web Resources:

Sr. No.	Online Resource Link	Source
1	Introduction to Design Thinking - Course (swyam2.ac.in) Design Thinking Full Course Design Thinking Process Design Thinking For Beginners Simplilearn - YouTube	Swayam (NPTEL) & YouTube
2	Thinking at IDEO - Insight, innovation, & a healthy dose of play	IDEO
3	INTRO (youtube.com)	YouTube
4	The Power of an Entrepreneurial Mindset Bill Roche TEDxLangleyED (youtube.com)	YouTube
5	https://www.ideou.com/pages/design-thinking	IDEO U
6	https://dschool.stanford.edu/	Stanford D school
7	https://www.designthinkersacademy.com/usa/	Design Thinking Institute
8	https://www.ibm.com/design/thinking/page/toolkit	Design thinking Tool Kit
9	https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo	

Course Plan:

Course Title: Indian Town Planning and Architecture	
Course Code: ITPA24FE116	Semester: I
Teaching Scheme: L-T-P:1-0-2	Credits: 02
Evaluation Scheme: ISE 20 marks	ESE Marks: 30 marks

Course Description:

Students would be introduced to the glorious past and achievements of the Indian subcontinent ranging from the “ancient period” to the “medieval period” concerning architecture and town planning. And develop a sense of pride and belongingness amongst the students towards Indian Knowledge Systems and further motivate them to bridge the gap between knowledge and application.

Course Objectives:

1.	To develop the knowledge and analysis on the understanding of eco-friendly, robust and scientific planning and architecture system of ancient India.
2.	To understand the importance of functional, aesthetic, psychological, culture and socio religious concept of ancient India architecture.
3.	To help the learners to trace, identify and develop the approach, process and material used in town and planning, construction and architecture
4.	To review and analyse the importance and significance of visual and performing arts and design in temples, houses, forts, caves and community places.
5.	To understand the various eco-friendly technology accepted in ancient civilization.

Course Outcomes (COs): At the end of the course, the students should be able to:

CO	Statements	BTL
116.1	Learn the importance of functional, aesthetic, psychological, culture and socio religious concept of ancient India architecture & Understand scientific planning and architecture system of ancient India.	1
116.2	Understand the various eco-friendly technology accepted in ancient civilization. And Inculcate the understanding of eco-friendly, robust and scientific planning.	2

Course Content:

Content	Duration
<p>Unit 1: The Introduction to ancient Architecture</p> <ul style="list-style-type: none"> • Introduction to relationship between Man, Nature, Culture and city forms. Study of determinants (Natural and man-made) influencing location, growth & pattern of human settlements including types of settlements growth (Organic and Planned) and settlement forms. • Architecture as satisfying human needs: functional, aesthetic and psychological outline of components and aspects of architectural form-site, structure, skin, materials, services, use, circulation, expression, character, experience 	05 Hrs
<p>Unit II: Ancient Architecture as Expression of Art & Design</p> <ul style="list-style-type: none"> • Pre-Harappa and Sindhu Valley Civilization, Engineering Science and Technology in the Vedic Age. • Post-Vedic Records, Iron Pillar of Delhi, Rakhigarh, Mehrgarh. • Marine Technology, and Bet–Dwarka, conventional building material, green building, heritage sites, fortification and maintenance, anthills. 	07 Hrs
<p>Unit III: Ancient Architecture Materials & Planning</p> <ul style="list-style-type: none"> • Clay products: Classification of bricks, Fire Brick, Fly Ash Bricks, Tiles, Terra-cotta, Earthenware, Porcelain, Stoneware. Stones: Uses of Stones, Qualities of Good Building Stones, Dressing, Common Building Stones of India. Glass: Different glass Forms and their Suitability, Timber: Different Forms and their Suitability Metals: Ferrous & Nonferrous Metals and Alloys, and, their Suitability, limitations, precautions Paints and Varnishes: Different types and their Suitability, limitations, precautions • Planning: Residence- site selection, site orientation- aspect, prospect, grouping, circulation, privacy, furniture requirements, services and other factors. Vastu shastra and its importance in building interrelationship with human, nature and cosmos • Town Planning: Town plans of Harappa, Mohenjodaro, Pataliputra, Delhi. Vastu shastra and its application in city layout. 	07 Hrs
<p>Unit IV: Ancient Architecture</p> <ul style="list-style-type: none"> • Important architecture: Walled towns, structures developed e.g.: Stupas, Stambhas, sacred railing etc. Study of worshipping places with special reference to Mahalaxmi Temple & Kopeswar Temple. • Tradition Indian villages & House: Regional house construction, interior & importance. • Scientific achievements though ancient architect: Musical Pillars of Vitthal temple, Sundial of Konark Temple, construction of eight shiva temple in straight line from Kedarnath to Rameswaram, Veerbhadra temple with 70 hanging pillars, Ellora caves excavating the mountain, Jaipur plan pink city etc. 	07 Hrs

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
116.1 P	1	-	-	-	-	-	-	-	-	-	-	-	2
116.2 P	2	-	-	-	-	-	-	-	-	-	-	-	2

Suggested Learning Resources:

Text Books:

Sr. No	Title	Author(s)	Publisher	Year
1.	Indian Knowledge Systems, Vol. 1.	Kapur K and Singh A K	Central Chinmay mission trust, Bombay, 1995	2005
2.	Mayamata: An Indian Treatise on Housing Architecture and Iconography	B Dagens,	Pustak Mahal, Delhi	2013
3.	The Miracles of Vaastu Shastra	S S Das	O'Reilly	2017
4.	Ancient India	R. C. Majumdar	--	2015

Course Title: Yoga	
Course Code: YOGA24FE117	Semester: I
Teaching Scheme: L-T-P: 1-0-2	Credits: 02
Evaluation Scheme: INT 50 marks	ESE:--

Course Objectives:

1.	To make the students understand the importance of sound health and fitness principles As they relate to better health.
2.	To expose the students to a variety of physical and yogic activities aimed at Stimulating their continued inquiry bout Yoga, physical education, health and fitness.
3.	To develop among students an appreciation of physical activity as a lifetime pursuitanda Means to better health.

Curriculum Details

Course Contents	Duration
Unit I: Physical Fitness, Wellness & Life style <ul style="list-style-type: none"> • Meaning & Importance of Physical Fitness & Wellness • Components of Physical fitness • Components of Health related fitness • Components of wellness • Preventing Health Threats through Lifestyle Change • Concept of Positive Lifestyle • Meaning & Importance of Yoga • Elements of Yoga • Introduction- Asanas, Pranayama, Meditation & Yogic Kriyas 	7 Hrs
Unit II: Physical Fitness, Wellness & Lifestyle <ul style="list-style-type: none"> • Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankana) • Relaxation Techniques for improving concentration-Yog-nidra • Asanas preventive measures. • Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana. • Obesity: Procedure, Benefits & contra indications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana. • Back Pain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana. • Diabetes: Procedure, Benefits & contraindications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana. • Asthema: Procedure, Benefits & contra indications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana. 	8 Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
117.1	To learn techniques for increasing concentration and decreasing anxiety this leads to stronger academic performance.
117.2	To understand basic skills associated with yoga and physical activities including Strength and flexibility, balance and coordination.
117.3	To perform yoga movements in various combination and forms.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

PO's CO's	BTL	1	2	3	4	5	6	7	8	9	10	11	12
117.1	1	-	-	-	-	-	-	-	-	-	-	-	2
117.2	1	-	-	-	-	-	-	-	-	-	-	-	2
117.3	1	-	-	-	-	-	-	-	-	-	-	-	2

Suggested Learning Resources:

Text Books:

Sr. No.	Title
1	Modern Trends and Physical Education by Prof. Ajmer Singh.
2	Light On Yoga by B. K. S. Iyengar.

Course Objectives:

1.	To make the students understand the importance of sound health and fitness principles As they relate to better health.
2.	To expose the students to a variety of physical and yogic activities aimed at Stimulating their continued inquiry about Yoga, physical education, health and fitness.
3.	To develop among students an appreciation of physical activity as a lifetime pursuitanda Means to better health.

Curriculum Details

Course Contents	Duration
1. Introduction- Asanas, Pranayama, Meditation & Yogic Kriyas	2Hrs
2. Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankasana)	2Hrs
3. Relaxation Techniques for improving concentration-Yog-nidra	2Hrs
4. Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana	2Hrs
5. Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana	2Hrs
6. BackPain: Tadasana, Ardh Matsyendrasana, Vakrasana, Shalabhasana, Bhujangasana	2Hrs
7. Procedure, Benefits & contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana	2Hrs
8. Procedure, Benefits & contra indications for Bhujangasana, Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana	2Hrs

Course Outcomes (COs): After successful completion of the course, students will be able to:

CO	Statements
117.1 P	To practice Physical activities and Hatha Yoga focusing on yoga for strength, flexibility, and relaxation.
117.2 P	To physically perform yoga movements in various combination and forms.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs)

PO's CO's	BTL	1	2	3	4	5	6	7	8	9	10	11	12
117.1 P	1	-	-	-	-	-	-	-	-	-	-	-	2
117.2 P	1	-	-	-	-	-	-	-	-	-	-	-	2

Suggested Learning Resources:

Text Books:

Sr. No.	Title
1	Modern Trends and Physical Education by Prof. Ajmer Singh.
2	Light On Yoga by B. K. S. Iyengar.