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										Total
Sr. No	Course Category	Number of Courses per Semester								
		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 Mechanical Engineering

Curriculum Structure

First Year Mechanical Engineering Program (Course 2024-25)

With Effective from Academic Year 2024-25

Curriculum Structure

First Year Mechanical Engineering

D. Y. PATIL TECHNICAL CAMPUS

FACULTY OF ENGINEERING & FACULTY OF MANAGEMENT, TALSANDE

(An Autonomous Institute)

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

SCHEME OF INSTRUCTION & CURRICULUM

Programme: - Mechanical Engineering

Semester - I

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Course Credits	EXAMS CHEME				
								ISE	MSE	ESE	INT	TOTAL
1	BSC	AM24FE111	Applied Mathematics-I	3	1	-	4	20	30	50	25	125
2		CHEM24FE112	Applied Chemistry	3	-	-	3	20	30	50	-	100
		CHEM24FE112P	Applied Chemistry 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
4		EGCAD24FE114	Engineering Graphics & Computer Aided Drawing	3	-	-	3	20	30	50	-	100
		EGCAD24FE114P	Engineering Graphics & Computer Aided Drawing 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	AEC	PC24FE116	Professional Communication	1	-	-	1	25	-	-	-	25
		PC24FE116P	Professional Communication Laboratory	-	-	2	1	-	-	-	25	25
7	CCA	NSS24FE117	NSS	1	-	2	2	-	-	-	50	50
Total				**15**	**1**	**12**	**22**	**130**	**120**	**200**	**200**	**650**
Noncredit 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

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SCHEME OF INSTRUCTION & SYLLABI

Programme: - Mechanical Engineering

Semester - II

Sr. No.	Course Category	Course Code	Course Title	L	T	P	Course Credits	EXAMS CHEME				
								ISE	MSE	ESE	INT	TOTAL
1	BSC	AM24FE121	Applied Mathematics-II	3	1	-	4	20	30	50	25	125
2		PHY24FE122	Applied Physics	3	-	-	3	20	30	50	-	100
		PHY24FE122P	Applied Physics 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	FME24FE124	Fundamentals of Mechanical Engineering	2	-	-	2	-	-	50	-	50
5	VSEC	CSMW24FE125	Carpentry and Sheet Metal Working	1	-	2	2	25	-	-	25	50
6	IKS	ITPA24FE126	Indian Town Planning and Architecture	2	-	-	2	20	-	30	-	50
7	CCA	YOGA24FE127	Yoga	1	-	2	2	-	-	-	50	50
Total				**15**	**1**	**8**	**20**	**105**	**90**	**230**	**150**	**575**
Noncredit 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

Course Title : Applied Mathematics II	
Course Code: AM24FE121	**Semester:** II
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:	Differentiation , Integration

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 Differential equation, Laplace Transform Vector Calculus and Integral Calculus.
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: Ordinary Differential Equations of First Order and First Degree • Definition of differential equation of First order and First degree. • Exact differential equations. • Non-exact differential equations. • Linear differential equations. • Bernoulli's differential equations.	**08 Hrs**
Unit-II: Numerical methods to solve Ordinary Differential Equations • Introduction • Picard's method. • Taylor's series method. • Euler's method. • Runge-Kutta's method (Fourth order)	**07 Hrs**
Unit-III : Vector Calculus • Introduction. • Gradient of scalar point function. • Divergence of vector point function. • Curl of a vector point function. • Irrotational, Solenoidal vector field	**07 Hrs**
Unit-IV: Laplace Transform • Laplace transforms of elementary functions	**08 Hrs**

Course Contents	Duration
• Properties of Laplace transforms (First Shifting ,Change of scale property , Multiplication & Division by t) • Inverse Laplace transforms by partial fraction	
Unit-V: Numerical Integration • Trapezoidal Rule. • Simpson's 1/3 rd Rule. • Simpson's 3/8 th Rule. • Weddle's Rule.	**07 Hrs**
Unit-VI : Multiple Integrals • Introduction of Double integrals • Method of evaluation of Double integrals • Change of order of integration • Area enclosed by plane curves • Mass of a plane lamina	**08 Hrs**

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

CO	Statements
1	**solve** ordinary differential equations of first order and first degree and **apply** the methods to solve engineering problems also **use** the numerical methods to differential equations of first order and first degree
2	**use** knowledge of vector differentiation to find curl and divergence of vector fields.
3	**understand** Laplace Transform and to s**olve the** problems on Laplace Transform
4	**solve** the integrals by numerical methods,**apply** multiple integrals to calculate areas and mass of lamina

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	3	3	3	3	-	-	-	-	-	-	-	-	-
2	3	2	2	2	-	-	-	-	-	-	-	-	-
3	2 ,3	2	2	2	-	-	-	-	-	-	-	-	-
4	3	3	3	3	-	-	-	-	-	-	-	-	-

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

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	Ordinary Differential Equations of First Order and First Degree	01 Hr
02	Ordinary Differential Equations of First Order and First Degree	01 Hr
03	Numerical methods to solve Ordinary Differential Equations	01 Hr
04	Numerical methods to solve Ordinary Differential Equations	01 Hr
05	Vector Calculus	01 Hr
06	Vector Calculus	01 Hr
07	Laplace Transform	01 Hr
08	Laplace Transform	01 Hr
09	Integral Calculus	01 Hr
10	Integral Calculus	01 Hr
11	Multiple Integrals	01 Hr
12	Multiple Integrals	01 Hr

Course Title: Applied Physics	
Course Code: PHY24FE122	**Semester: II**
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:	Fundamentals of optics, Newton's laws etc.

Course Objectives:

1.	To provide basic concept of modern optics.
2.	To perceive the concepts of Moment of inertia, elasticity, and their applications in engineering fields
3.	To understand properties of fluid, and their applications in engineering fields.
4.	To understand the students, basic concepts of nanotechnology and quantum mechanics.

Curriculum Details

Course Contents	Duration
Unit I: Diffraction and Polarization of Light **Diffraction:** • Diffraction- Concept and types (Fresnel and Fraunhofer diffraction), • Diffraction grating – construction and theory, • Resolving power of plane transmission grating. **Polarization:** • Introduction, double refraction, • Huygens' theory (positive and negative crystals), • Optical Activity, Specific Rotation, • Laurent's half shade polarimeter.	**7 Hrs**
Unit -II: Rotational motion • Definition of - M.I., K.E. of rotating body, Rolling motion, • Physical significance of M.I., • Radius of gyration, Torque, • Principle of parallel and perpendicular axes, • M.I. of some regular shaped bodies about specific axes- rod, cylinder, sphere, Angular momentum and its conservation.	**7 Hrs**
Unit -III: Properties of materials	

Course Contents	Duration
• Deforming Force and Restoring Force, • Elasticity, Plasticity, Rigidity. • Stress and Strain and their types, • Elastic limit and Hooke's law, • Types of moduli of elasticity. • Stress -Strain diagram, Poisson's ratio, • Behaviour of metal wire under increasing load, • Factors affecting elasticity.	**7 Hrs**
Unit -IV: Properties of fluids • Pressure-depth relation ($P = \rho h g$), • Atmospheric pressure, Pascal's law, Archimedes' principle. • Viscous force, definition of viscosity, velocity gradient, • Newton's law of viscosity, coefficient of viscosity and its SI unit, • Streamline and turbulent flow with examples, • critical velocity, Reynold's number, and its significance. • Up thrust force, terminal velocity, Stokes law. • Derivation of coefficient of viscosity by Stoke's method.	**7 Hrs**
Unit -V: Nano Technology • 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 • 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**

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

CO	Statements
122.1	**Describe** the principle of diffraction and relate concepts in various engineering applications.
122.2	**Apply** the concepts of moment of inertia, elasticity in various engineering applications.
122.3	**Apply** the concepts of properties of fluids in various engineering applications.
122.4	**Explain** the need for nanomaterials in science and technology and quantum mechanics concepts.

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
122.1	2	2	2	2	-	-	-	-	-	-	-	-	-
122.2	3	3	3	3	-	-	-	-	-	-	-	-	-
122.3	3	2	2	2	-	-	-	-	-	-	-	-	-
122.4	3	3	3	3	-	-	-	-	-	-	-	-	-

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering Physics	1st	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

Reference Books:

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

Course Title: Applied Physics Laboratory	
Course Code: PHY24FE122P	**Semester: II**
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

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-

Exp. No	Title of Experiments	Duration
01	Calculate the wavelength of a monochromatic lightby using Bi-prism experiment	02Hrs
02	To study diffraction at Cylindrical obstacle.	02Hrs
03	Wavelength of different spectral lines of mercury using grating.	02Hrs
04	Calculation of R. P. of grating by using spectrometer	02Hrs
05	To find Resolving power of Telescope	02Hrs
06	Verification of inverse square law of intensity of light.	02Hrs
07	To find specific rotation by using half shaded Polarimeter.	02Hrs
08	Calculation of divergence of LASER beam.	02Hrs
09	Determine of surface tension of given liquid by Jeagers method	02Hrs
10	Determine coefficient of viscosity of given liquid using Stoke's method	02Hrs
11	Determine stiffness constant 'K' of a helical spring.	02Hrs
12	Modulus of rigidity by Torsional oscillations	02Hrs

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

CO	Statements
122.1	**Interpret** knowledge related to optics to use for suitable purposes in applied physics
122.2	**Interpret** knowledge related to properties of fluids for suitable purposes in applied physics
122.3	**Explain** applications of M.I., elasticity, surface tension.
122.4	**Interpret** knowledge related to inverse square law for suitable purposes in applied physics

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
122.1	2	3	3	3	-	-	-	-	-	3	-	-	-
122.2	3	3	3	3	-	-	-	-	-	3	-	-	-
122.3	3	3	3	3	-	-	-	-	-	3	-	-	-
122.4	3	3	3	3	-	-	-	-	-	3	-	-	-

Suggested Learning Resources: --
Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering Physics	1st	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

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
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	1st	R.K. Gaur, S.L. Gupta	Dhanpat Rai Publications	1993

Useful Link /Web Resources:

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

Course Title :-Generative AI	
Course Code:- ME24FE123	**Semester: II**
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:	Basic mathematics, Statistics

Course Objectives:

1.	To explain the fundamental concepts, principles and technology of generative AI
2.	To prepare the students with demanding industry skills
3.	To provide an opportunity to develop expertise in AI tools & technologies.
4	To apply theoretical understanding to hands-on interdisciplinary projects, solving problems using Generative AI models

Curriculum Details:

Course Contents	Duration
Unit-I Introduction to Generative AI • Basics of AI And ML. and DL • Definition and scope of Generative AI • Generative AI Origin • Overview of generative models and their applications • Difference between generative and discriminative models • Understanding Risks & Limitations	**08 Hrs**
Unit-II Basics on NLP • What is NLP? History of NLP • Components of NLP- Syntax, Semantics, Pragmatics, Discourse • Introduction to NLP techniques and methods • Various NLP Tasks • Application of NLP- Industry application and Everyday applications • Challenges and future of NLP	**06 Hrs**
Unit-III Language Models and LLM Architectures • Introduction to language models and their role in AI • Traditional approaches to language modelling • Deep learning-based language models and their advantages • Overview of popular LLM architectures: RNNs, LSTMs, and Transformers	**07 Hrs**
Unit-IV Understanding GPT (Generative Pre-trained Transformer) and ChatGPT • Introduction to GPT and its significance • Pre-training and fine-tuning processes in GPT Architecture and working of GPT models	**09 Hrs**

Course Contents	Duration
• Overview of GPT variants and their use cases • Introduction to ChatGPT and its purpose • Training data and techniques for ChatGPT • Handling user queries and generating responses • Tips for improving ChatGPT's performance.	
Unit-V Prompt Engineering • The Fundamentals of Prompt Engineering • Components of a prompt • Techniques for prompt engineering • Applications of Prompt Engineering • Potential prompt misuses	**07 Hrs**
Unit-VI Future of generative AI and Ethical Considerations in Generative AI • Emerging trends in Generative AI • Generative AI technology evolution • Opportunities for innovations and growth • Understanding the ethical implications of generative models • Addressing bias and fairness in generative AI systems • Ensuring responsible use and deployment of generative models	**08 Hrs**

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

CO	Statements
1	Explain the fundamental concepts, principles and technology of generative AI.
2	Describe the generative AI landscape and its practical applications across various industries.
3	Apply prompt engineering from understanding its techniques and patterns.
4	Discuss emerging trends and future directions in generative AI, including ethical considerations and challenges associated with its use.

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	2	2	1	-	-	-	1	1	-	-	-	-	-
3	3	2	2	1	1	3	1	-	-	-	-	-	-
4	6	2	2	2	2	2	1	-	-	-	-	-	-

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	“Generative AI for everyone: Understanding the essentials and applications of this breakthrough technology".	-	Altaf Rehmani	-	-
2	"Introduction to Generative AI”.	Kindle Edition	Numa Dhamani		2024

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	"Generative Adversarial Networks Cookbook: Over 100 recipes to build generative models using Python, TensorFlow, and Keras" by Josh Kalin.	-	Josh Kalin	-	-
2	“Generative AI in Software Development: Beyond the Limitations of Traditional Coding” Jesse Sprinter, 2024.	-	Jesse Sprinter	-	2024

Useful Link /Web Resources:

1. https://elearn.nptel.ac.in/shop/iit-workshops/completed/leveraging-generative-ai-for-teaching-programming-courses/?v=c86ee0d9d7ed
2. https://elearn.nptel.ac.in/shop/iit-workshops/completed/introduction-to-language-models/?v=c86ee0d9d7ed

Course Title: Generative AI Laboratory	
Course Code : ME24FE123P	**Semester: II**
Teaching Scheme: L-T-P: 0-0-2	**Credit : 1**
Evaluation Scheme: ISE: INT-25 Marks	**ESE/POE/OE Marks: -**

Prior Knowledge of:	Basic mathematics, Statistics

Course Objectives:

1.	To provide fundamental knowledge of AI
2.	To prepare the students with demanding industry skills
3.	To provide an opportunity to develop expertise in AI tools & technologies.
4.	To apply theoretical understanding to hands-on interdisciplinary projects, solving problems using Generative AI models

List of Experiments-

Exp. No	**Title of Experiments**	**Duration**
01	Generative AI tools and platforms	2 Hrs
02	NLP use cases in business- Social Media Monitoring, Autocorrect, Spell Check Speech Recognition, Machine Translation	2 Hrs
03	Study of ChatGPT to conduct a simple conversation and analyze the responses.	2 Hrs
04	Study of Scribe.	2 Hrs
05	Study of AlphaCode.	2 Hrs
06	Study of GitHub Copilot.	2 Hrs
07	Study of GPT-4.	2 Hrs
08	Study of Chatbots and Text Generators.	2 Hrs
09	Study of Colormind.	2 Hrs
10	Study of Kite.	2 Hrs

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

CO	**Statements**
1	Understand with basic AI.
2	Understand the evolution of AI.
3	Apply AI tools to various business models.
4	Generate innovative ideas, contents & outputs for industry applications.

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	2	1	-	-	-	2	-	-	-	-	-	2
2	2	2	1	-	-	-	1	1	-	-	-	-	2
3	3	2	2	1	1	3	1	-	-	-	-	-	2
4	6	2	2	2	2	2	1	-	-	-	-	-	2

Suggested Learning Resources: --

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	"Generative AI for everyone: Understanding the essentials and applications of this breakthrough technology".	-	Altaf Rehmani	-	-
2	"Introduction to Generative AI'	Kindle Edition	Numa Dhamani		2024

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	"Generative Adversarial Networks Cookbook: Over 100 recipes to build generative models using Python, TensorFlow, and Keras" by Josh Kalin. .	-	Josh Kalin	-	-
2	"Generative AI in Software Development: Beyond the Limitations of Traditional Coding" Jesse Sprinter, 2024.	-	Jesse Sprinter	-	2024

Useful Link /Web Resources:

1. https://elearn.nptel.ac.in/shop/iit-workshops/completed/leveraging-generative-ai-for-teaching-programming-courses/?v=c86ee0d9d7ed
2. https://elearn.nptel.ac.in/shop/iit-workshops/completed/introduction-to-language-models/?v=c86ee0d9d7ed

D.Y.PATIL TECHNICALCAMPUS

FACULTY OF ENGINEERING & FACULTY OF MANAGEMENT,

(An Autonomous Institute)

Department of First Year Engineering

F. Y. B. Tech. Curriculum

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

Course Title : Fundamentals Mechanical Engineering	
Course Code: FME24FE124	**Semester:** II
Teaching Scheme L-T-P : 2-0-0	**Credits : 02**
Evaluation Scheme: --	**ESE Marks : 50 marks**

Prerequisite	1. Fundamental concepts of physics like Volume, Pressure, Velocity, Energy, Heat, Work 2. Basics of Mathematics.

Course Objectives:

1.	To make aware of basics of thermodynamics and heat engines
2.	To provide adequate knowledge of different types of power plant and energy sources
3.	To get familiar with power transmission and power conversion
4	To get comprehensive knowledge of manufacturing processes used within the manufacturing industry

Course Content:-

Course Contents	Duration Hours
Unit-I : Introduction to Thermodynamics and Heat Engines • Introduction to Thermodynamics, • Laws of thermodynamics, • Introduction to IC Engines, • Construction and Working of C.I. and S.I. Engines. • Introduction to refrigeration systems and air conditioning. Applications of refrigeration and air conditioning	**07**
Unit-II Energy Sources and power plants • Renewable and non-renewable, fuels, hydraulic energy, solar energy, wind energy, nuclear energy, biogas, biodiesel. • Wind power plant, Hydropower plant, Steam Power plant, Solar water heater and photovoltaic cell	**07**
Unit-III Mechanical Power Transmission and Energy conversion devices • Type of Belt and belt drives, chain drive, Types of gears and gear Trains • Introduction to Pumps, Compressors and Turbines	**07**
Unit-IV Manufacturing Processes • Introduction to manufacturing processes - Casting Process, Steps involved in casting processes, and their applications, • Metal removing processes (Lathe, milling & drilling operations) • Metal Joining Processes – Arc welding, soldering and brazing and their applications. • Introduction and components of CNC, advantages and applications of CNC, • Introduction to Mechatronics and robotics,	**07**

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

CO	Statements
124.1	Remember the laws of thermodynamics as well ascomponents and working of heat engines
124.2	Understand different types of energy sources and power plants
124.3	Explain construction ,working and select devices used for mechanical power transmission and energy conversion
124.4	Understand different types of manufacturing process

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	2	--	--	--	--	--	--	--	--	--
2	2	2	3	2	--	--	--	--	--	--	--	--	--
3	2	2	2	2	--	--	--	1	--	--	--	--	--
4	2	1	2	--	--	--	--	--	--	--	--	--	--

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Non-Conventional Sources of Energy	Second	G.D. Rai	Khanna Publication	2014
2	Basic Mechanical Engineering	Second	Pravinkumar	Pearson	2018
3	Basic Mechanical Engineering by	Second	Basant Agrawal & C. M. Agrwal	Wiley India Pvt. Ltd.	2018
4	Elements of Workshop Technology, Vol.I and II by HajaraChoudhari, MediaPromoters	Second	Hajara Choudhari	MediaPromoters	2014

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Thermal Engineering	Ninth	R.K. Rajput	, Laxmi Publication,Delhi	2013
2	Non-Conventional Sources of Energy by	Fifth	G.D. Rai	Khanna Publication Delhi	2015
3	Power Plant Engineering	Fourth	Arora and Domkunwar	DhanpatRai andSons	2015
4	Theory of Machines	Fourth	S.S.Ratan	Tata McGraw Hill Education Private Limited Delhi	2014

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 : Carpentry and Sheet Metal Working	
Course Code: ME24FE127	**Semester:** II
Teaching Scheme: L-T-P :- 1-0-0	**Credits : 1**
Evaluation Scheme: ISE-25	**INT Marks: 25**

Prior Knowledge of:	For effectively working in sheet metal one should have knowledge of hand tools, sheet metal machines, properties of metals, proper knowledge of timber frames, basics of a skeletal structure of a building and Timber frames

Course Objectives:

1.	To train the students to use different tools and equipment's involved in manufacturing processes.
2.	To develop the skills to handle the basic hand tools required to manufacture Sheet metal& Carpentry model for specific application
3.	Introduce to different materials in engineering practices with respect to their workability, formability and machinability with different equipment's
4.	To develop the skills to handle the basic hand tools required to manufacture Carpentry model for specific application

Curriculum Details

Course Contents	Duration
Unit-I Sheet Metal Work • Specifications of metal sheets, working tools, • Sheet metal operations like-cutting, bending, folding, punching, reverting and joining by brazing and soldering.	**6 Hrs**
Unit-II Carpentry • Introduction, Classifications of wood, • Common varieties of Indian timber, • Carpentry tools like- Marking tools, cutting tools, planes, striking tools, holding tools. Carpentry operations- marking, sawing, chiselling, grooving etc. carpentry joints	**8 Hrs**

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

CO	Statements
1	Identify Basic engineering workshop practices
2	Identify different tools used for Sheet metal and Carpentry operations
3	Enhance their knowledge skill sets with hand-on experience and teamwork inculcating analysis and lifelong learning by making a component with Sheet metal and carpentry tools at a defined accuracy.
4	Develop Carpentry model for specific application

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	2	-	-	2	-	-	1	-	-	-	1
2	1	3	2	-	-	-	-	-	-	-	-	-	1
3	2	3	2	-	-	-	1	-	-	-	-	-	1
4	2	3	2	-	-	-	-	-	1	-	-	-	1

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	A Course in Workshop Technology	Vol –I	B. S. Raghuvanshi,.	DhanapatRai and Sons	2017
2	Elements of Workshop Technology,	Vol –I	HajaraChaudhari,	Media Promoters	2018
3	Workshop Technology,	Vol –I	Gupta and Kaushik,	New Heights.	2016
4	Workshop Technology,	Vol –I	Chapman	The English Language Book Society.	2016

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 : Carpentry and Sheet Metal Working	
Course Code: ME24FE127	**Semester:** II
Teaching Scheme: L-T-P : 0-0-2	**Credits : 1**
Evaluation Scheme: INT- 25 marks	**ESE Marks : --**

Prior Knowledge of:	Preliminary knowledge of Physics and Mathematics

Course Objectives:

1.	To train the students to use different tools and equipment's involved in manufacturing processes.
2.	To develop the skills to handle the basic hand tools required to manufacture Sheet metal for specific application
3.	To develop the skills to handle the basic hand tools required to manufacture Carpentry model for specific application
4	introduce to different materials in engineering practices with respect to their workability, formability and machinability with different equipment's

Curriculum Details

Course Contents	**Duration**
Term Work:	
1. Sheet Metal: To make small job like Pan, Tray, Box etc. Using sheet metal operation like Cutting, Bending, Folding etc	**6 Hrs**
2. Carpentry: One composite job involving dovetail joint, T joint, cross halving joint, pen stand etc.	**8 Hrs**

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

CO	**Statements**
1	Identify Basic engineering workshop practices
2	Identify different tools used for Sheet metal and Carpentry operations
3	Enhance their knowledge skill sets with hand-on experience and teamwork inculcating analysis and lifelong learning by making a component with Sheet metal and carpentry tools at a defined accuracy.
4	Develop Carpentry model for specific application

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	2	-	-	2	-	-	1	-	-	-	1
2	1	3	2	-	-	-	-	-	-	-	-	-	1
3	2	3	2	-	-	-	1	-	-	-	-	-	1
4	2	3	2	-	-	-	-	-	1	-	-	-	1

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	A Course in Workshop Technology	Vol –I	B. S. Raghuvanshi,.	DhanapatRai and Sons	2017
2	Elements of Workshop Technology,	Vol –I	HajaraChaudhari,	Media Promoters	2018
3	Workshop Technology,	Vol –I	Gupta and Kaushik,	New Heights.	2016
4	Workshop Technology,	Vol –I	Chapman	The English Language Book Society.	2016

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 Plan:

Course Title: Indian Town Planning and Architecture	
Course Code: ITPA24FE126	**Semester: II**
Teaching Scheme: L-T-P:1-0-2	**Credits: 0**2
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 technologies accepted in ancient civilization.

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

CO	Statements	BTL
126.1	**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**
126.2	**Understand** the various eco-friendly technologies accepted in ancient civilization. And **Inculcate** the understanding of eco-friendly, robust and scientific planning.	**2**

Course Content:

Content	Duration
Unit 1: The Introduction to ancient Architecture • 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**
Unit II: Ancient Architecture as Expression of Art & Design • 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**
Unit III: Ancient Architecture Materials & Planning • 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**
Unit IV: Ancient Architecture • Important architecture:Walled towns, structures developed e.g.: Stupas, Stambhas, sacred railing etc. Study of worshipping places with special reference to Mahalaxmi Temple & Kopeshwar Temple. • Tradition Indian villages & House: Regional house construction, interior & importance. • Scientific achievements though ancient architect: Musical Pillars of Vitthal temple, Sundial of KonarkTemple, 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**

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
126.1 P	1	-	-	-	-	-	-	-	-	-	-	-	2
126.2 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: YOGA24FE127	**Semester: II**
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 • 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 • Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankana) • Relaxation Techniques for improving concentration-Yog-nidra • Asanasas 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.