

D. Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

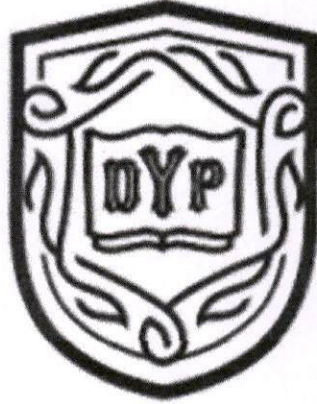
Kasaba Bawada, Kolhapur

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University Kolhapur)

(An Autonomous Institute)

Accredited by NAAC with 'A' Grade

Accredited by NBA



Structure and Curriculum

(As Per National Education Policy 2020)

For

First Year B.Tech.

in

Department of Mechanical Engineering

w. e. f. A.Y.: 2024-25

Bohara
PRINCIPAL

**D. Y. PATIL College of Engineering
And Technology
Kasaba Bawada, Kolhapur.
(An Autonomous Institute)**

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HEAD

**Dept. of First Year Engg.
D. Y. Patil College of Engg. & Tech.
Kasaba Bawada, Kolhapur**



D. Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institute)

Department of Mechanical Engineering


F. Y. B. Tech. Structure

Scheme of Teaching and Evaluation w. e. f. A. Y. 2024-2025

(As Per National Education Policy 2020)

Semester-I (Chemistry Cycle)

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation Scheme			
				L	T	P			Type	Max. Marks	Minimum Marks for Passing	
Students Induction Program as Per AICTE Guidelines												
1	241MEBSCL101	BSC	Fundamentals of Linear Algebra and Calculus	03	--	--	03	100	ISE	20	20	40
									MSE	30		
									ESE	50		
2	241MEBSCL102	BSC	Applied Chemistry for Mechanical Engineering	03	--	--	03	100	ISE	20	20	40
									MSE	30		
									ESE	50		
3	241MEESCL101	ESC	Generative AI	03	--	--	03	100	ISE	20	20	40
									MSE	30		
									ESE	50		
4	241MEAECL101	AEC	Professional Communication	01	--	--	01	25	ISE	25	10	10
5	241MEVSECL101	VSEC	Computer Workshop	01	--	--	01	25	ISE	25	10	10
6	214MEPCCL101	PCC	Foundation of Mechanical Engineering-I	02	--	--	02	50	ISE	20	20	20
									MSE	30		
7	241MEBSCT101	BSC	Fundamentals of Linear Algebra and Calculus Tutorial	--	01	--	01	25	ISE	25	10	10
8	241MEBSCP102	BSC	Applied Chemistry for Mechanical Engineering Laboratory	--	--	02	01	25	ISE	25	10	10
9	241MEESCP101	ESC	Generative AI Laboratory	--	--	02	01	25	ISE	25	10	10
10	241MEAECP101	AEC	Professional Communication Laboratory	--	--	02	01	25	ISE	25	10	10
11	241MEVSECP101	VSEC	Computer Workshop Laboratory	--	--	02	01	25	ISE	25	10	10
12	241MECCAL101	CCA	Liberal Learning	--	--	04	02	50	ISE	50	20	20
Total				13	01	12	20	575	--	--	--	--
Non -Credits Mandatory Courses												
1	241MEMCL101	MC	Finishing School Training I	03	--	--	--	50	ISE	50	20	20
2	241MEMCP102	MC	Rural/Social Internship	--	--	--	--	50	ISE	50	20	20


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
F. Y. B. Tech. Structure

Scheme of Teaching and Evaluation w. e. f. A. Y. 2024-2025

(As Per National Education Policy 2020)

Semester-II (Chemistry Cycle)

Sr. No	Course Code	Course Type	Name of the Course	Teaching Scheme Per Week			Credits	Total Marks	Evaluation Scheme			
				L	T	P			Type	Max. Marks	Minimum Marks for Passing	
1	241MEBSCL103	BSC	Numerical Techniques	03	--	--	03	100	ISE	20	20	40
								MSE	30			
								ESE	50			
2	241MEBSCL104	BSC	Physics for Mechanical Engineering	03	--	--	03	100	ISE	20	20	40
								MSE	30			
								ESE	50			
3	241MEESCL102	ESC	Computer Programming and Problem Solving	03	--	--	03	100	ISE	20	20	40
								MSE	30			
								ESE	50			
4	241MEESCL103	ESC	Computer Aided Machine Drawing	03	--	--	03	100	ISE	20	20	40
								MSE	30			
								ESE	50			
5	241MEVSECL102	VSEC	Design Thinking Through Innovation	01	--	--	01	25	ISE	25	10	10
6	241MEIKSL101	IKS	Historical Places in and Around Kolhapur District	02	--	--	02	50	ISE	20	20	20
								MSE	30			
7	241MEBSCT103	BSC	Numerical Techniques Tutorial	--	01	--	01	25	ISE	25	10	10
8	241MEBSCP104	BSC	Physics for Mechanical Engineering Laboratory	--	--	02	01	25	ISE	25	10	10
9	241MEESCP102	ESC	Computer Programming and Problem-Solving Laboratory	--	--	02	01	25	ISE	25	10	10
10	241MEESCP103	ESC	Computer Aided Machine Drawing Laboratory	--	--	02	01	25	ISE	25	10	10
11	241MEVSECP102	VSEC	Design Thinking Through Innovation Laboratory	--	--	02	01	25	ISE	25	10	10
12	241MECCAL102	CCA	Liberal Learning	--	--	04	02	50	ISE	50	20	20
Total				15	01	12	22	650	--	--	--	--
Non- Credits Mandatory Courses												
1	241MEMCL103	MC	Finishing School Training II	03	--	--	--	50	ISE	50	20	Grade
2	241MEMCL104	MC	Capstone Project	--	--	--	--	50	ISE	50	20	Grade


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Department of Mechanical Engineering

F. Y. B. Tech. Curriculum

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

Course Title: Fundamentals of Linear Algebra and Calculus	
Course Code: 241MEBSCL101	Semester: I
Teaching Scheme: L-T-P: 03-00-00	Credits: 03
Evaluation Scheme ISE-I/MSE/ISE-II: 10 /30/10	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 Calculus
4.	To imbibe graduates with mathematical knowledge, computational skills and the ability to deploy these skills effectively in solution of engineering problems

Curriculum Details :

Course Contents	Duration
Unit 1: Elementary Linear Algebra <ul style="list-style-type: none">• Introduction to matrices, types of matrices• Rank of matrix by normal form and echelon form• Reduction of a matrix A to normal form PAQ• Solution of simultaneous linear non-homogenous equations• Solution of simultaneous linear homogenous equations	07 Hrs
Unit 2: Numerical Solutions of Linear Algebra <ul style="list-style-type: none">• Introduction• Gauss–Elimination method• Gauss –Jordan method• Gauss –Seidel method• Jacobi’s iterative method	07 Hrs
Unit 3: Linear Algebra <ul style="list-style-type: none">• Definition of linear combination of vectors• Dependence and independence of vectors	



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F. Y. B. Tech. Curriculum

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Course Contents	Duration
<ul style="list-style-type: none">• Eigen values and its properties• Eigen vectors and its properties• Largest eigenvalue by Rayleigh's power method• Cayley-Hamilton theorem	07 Hrs
Unit 4: Differential Calculus <ul style="list-style-type: none">• Introduction.• Partial derivatives• Total derivatives• Euler's theorem on homogeneous functions• Jacobian and its properties	07 Hrs
Unit 5: Ordinary Differential Equations of First Order and First Degree <ul style="list-style-type: none">• Definition of differential equation, order and degree of differential equation• Exact differential equations• Non - exact differential equations• Linear differential equations• Bernoulli's differential equations	07 Hrs
Unit 6 : Numerical methods to solve Ordinary Differential Equations <ul style="list-style-type: none">• Introduction• Picard's method• Taylor's series method• Euler's method• Runge - Kutta's method (Fourth order)	07 Hrs

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

CO	Statements
101.1	Reduce matrices to echelon form and apply the concept of rank of matrices to solve system of linear equations
101.2	Solve linear equations by numerical methods
101.3	Identify eigen values & make use of it for finding eigen vectors
101.4	Apply the knowledge of partial differentiation
101.5	Solve ordinary differential equations of first order and first degree
101.6	Use the numerical methods to solve ordinary differential equations

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
101.1	3	3	2	--	--	1	--	--	--	--	--	--	1
101.2	3	3	2	--	--	1	--	--	--	--	--	--	1
101.3	3	3	2	--	--	1	--	--	--	--	--	--	1
101.4	3	3	2	--	--	--	--	--	--	--	--	--	1
101.5	3	3	2	--	--	1	--	--	--	--	--	--	1
101.6	3	3	2	--	--	1	--	--	--	--	--	--	1

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F. Y. B. Tech. Curriculum

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

Text Books:

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

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Advanced Engineering Mathematics	5 th	Erwin Kreyszig	India Pvt, Ltd.	2014
2	Higher Engineering Mathematics	6 th	B. V. Ramana	Tata M/c GrawHill Publicatio	2010
3	Numerical Methods for Scientific and Engineering Computation	5 th	M.K.Jain	New Age International Pvt. Ltd New Delhi	2017
4	A Textbook of Engineering Mathematics	6 th	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>
4. https://www.youtube.com/results?search_query=Dr+Navneet+Sangle

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F. Y. B. Tech. Curriculum

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

Course Title: Fundamentals of Linear Algebra and Calculus Tutorial	
Course Code: 241MEBSCT101	Semester: I
Teaching Scheme: L-T-P : 00-01-00	Credits: 01
Evaluation Scheme : ISE: 25	ESE Marks: 00

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 calculus
4.	To imbibe graduates with mathematical knowledge, computational skills and the ability to deploy these skills effectively in solution of engineering problems

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

CO	Statements
101.1	Reduce matrices to echelon form and apply the concept of rank of matrices to solve system of linear equations
101.2	Solve linear equations by numerical methods
101.3	Identify eigen values & make use of it for finding eigen vectors
101.4	Apply the knowledge of partial differentiation
101.5	Solve ordinary differential equations of first order and first degree
101.6	Use the numerical methods to solve ordinary differential equations



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List of Tutorials-

Tut. No.	Title of Tutorials	Duration
1.	Elementary Linear Algebra: Rank of matrix, solutions of non-homogenous simultaneous linear equations.	01Hr
2.	Elementary Linear Algebra: Solutions of simultaneous linear homogeneous equations.	01Hr
3.	Numerical Solutions of Linear Algebra: Gauss–Elimination method, Gauss–Jordan method.	01Hr
4.	Numerical Solutions of Linear Algebra: Gauss–Seidel method, Jacobi’s iterative method.	01Hr
5.	Linear Algebra: Dependence and Independence of vectors, Rayleigh’s power method.	01Hr
6.	Linear Algebra: Eigen values and Eigen vectors of Matrix, Cayley-Hamilton Theorem.	01Hr
7.	Linear algebra using SCILAB/MATLAB.	01Hr
8.	Differential Calculus: Partial derivatives, total derivatives, Euler's theorem on homogeneous functions.	01Hr
9.	Differential Calculus: Jacobian and its properties.	01Hr
10.	Numerical methods to solve Ordinary Differential Equations Picard’s method, Taylor’s series method	01Hr
11.	Numerical methods to solve Ordinary Differential Equations Euler's method, Runge - Kutta’s method	01Hr
11	Ordinary Differential Equations: Exact and non-exact differential equations , Linear and Non-linear differential equations.	01Hr
12	Ordinary Differential Equations using SCILAB/MATLAB.	01Hr

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Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

Cos	POs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
	101.1	3	3	2	--	--	1	--	--	--	--	--	--	--
101.2	3	3	2	--	--	1	--	--	--	--	--	--	--	1
101.3	3	3	2	--	--	1	--	--	--	--	--	--	--	1
101.4	3	3	2	--	--	-	--	--	--	--	--	--	--	1
101.5	3	3	2	--	--	1	--	--	--	--	--	--	--	1
101.6	3	3	2	--	--	1	--	--	--	--	--	--	--	1

Text Books:

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



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2.	Higher Engineering Mathematics	6 th	B.V.Ramana	Tata M/c GrawHill Publicatio	2010
3.	Numerical Methods for Scientific and Engineering Computation	5 th	M.K.Jain	New Age International Pvt. Ltd New Delhi	2022
4.	A Textbook of Engineering Mathematics	6 th	N.P.Bali, Iyengar	Laxmi Publication	2004

Useful Link /Web Resources:

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2. NDL-<http://ndl.iitkgp.ac.in>
3. N-LIST- <http://www.nlist.inflib.ac.in>
4. https://www.youtube.com/results?search_query=Dr+Navneet+Sangle



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F. Y. B. Tech. Curriculum

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

Course Title: Applied Chemistry for Mechanical Engineering	
Course Code : 241MEBSCL102	Semester: I
Teaching Scheme L-T-P: 03-00-00	Credits: 03
Evaluation Scheme ISE-I/MSE/ISE-II: 10/30/10	ESE Marks: 50

Prior Knowledge of:	Periodic properties of elements, Basics of organic, inorganic, physical and analytical chemistry
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Course Objectives:

1.	To Apply the theoretical aspect for understanding the water chemistry
2.	To understand the basic knowledge of some energy storage devices
3.	To understand the basic concepts of fuel and corrosion properties
4.	To explain advanced engineering materials and nano materials

Curriculum Details

Course contents	Duration
Unit 1: Water Chemistry <ul style="list-style-type: none">• Introduction• Impurities in natural water• Water quality parameters total solids, acidity, alkalinity and chlorides,(definition, causes, significance)• Hardness of water, types of hardness, units of hardness, numerical onhardness• ill effects of hard water in steam generation in boilers (scale & sludgeformation)• Treatment of hard water (Ion exchange and reverse osmosis process)	07 Hrs
Unit 2: Energy storage and conversion devices <ul style="list-style-type: none">• Introduction to basic principles of electrochemistry• Battery & its classification• primary cell (Carbon zinc cell, Lithium cell)• secondary cell (Rechargeable alkaline storage battery- Ni-Cd Battery, rechargeable lithium ion batteries)• Introduction to fuel cells, advantages and disadvantages	07Hrs



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Course contents	Duration
<ul style="list-style-type: none">• Types of fuel cells• H₂-O₂ fuel cells (construction, working and applications)	
Unit 3: Fuels & Alternative fuels <ul style="list-style-type: none">• Introduction• Classification, calorific value, definition, units (calorie, kcal, joules, kilojoules)• Characteristics of good fuels• Boy's Calorimeter and their numerical• Knocking in internal combustion engines• Reasons for knocking• Octane and cetane number• Biodiesel	07 Hrs
Unit 4: Corrosion Science and Management <ul style="list-style-type: none">• Electrochemical theory of Corrosion• Corrosion and its classification: Dry and wet corrosion• Factor affecting rate of corrosion• Corrosion control: Metal coating-galvanization and tinning• surface conversion coating - anodizing and phosphating.• Metal finishing: electroplating of chromium and electroless plating of copper	07 Hrs
Unit 5: Chemistry of nanomaterials <ul style="list-style-type: none">• Introduction to nanomaterials• Size dependent properties: Surface area, optical and catalytic• Classification of nanomaterials• Synthesis method: Sol gel method• Synthesis, properties and applications of Fullerenes• Characteristics and applications of carbon nanotubes• Characteristics and applications of graphene	07 Hrs

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Course contents	Duration
Unit 6: Engineering polymers nanocomposites and reinforcements: <ul style="list-style-type: none">• Polymers: Introduction• Plastics, thermos-softening and thermosetting plastics• Industrially important plastics like phenol formaldehyde, urea formaldehyde and epoxy resins• Conducting polymers and Biodegradable polymers (Introduction, synthesis properties and applications of polylactic acid)• Reinforcements: Introduction, Composition, properties• applications of fiber reinforced plastics (FRP)• applications of glass reinforced plastic (GRP)	07 Hrs

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

CO	Statements
102.1	Interpret hardness, acidity, alkalinity and chloride content of water and methods for waters of testing
102.2	Evaluate electro chemical energy storage system such as lithium batteries and design for usages in electronics applications
102.3	Discuss fuels and concept of green chemistry with its applications
102.4	Correlate basics concept of corrosion science and its prevention
102.5	Summarize synthesis, properties and applications of nanomaterials
102.6	Illustrate general synthesis and mechanisms of some advanced polymeric materials



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Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes(PO)

PO \ CO	BTL	1	2	3	4	5	6	7	8	9	10	11	12
102.1	3	3	2	--	--	--	--	--	--	--	--	--	1
102.2	2	3	--	--	--	--	--	--	--	--	--	--	1
102.3	3	3	2	--	--	--	--	--	--	--	--	--	1
102.4	2	3	--	--	--	--	--	--	--	--	--	--	1
102.5	2	3	--	--	--	--	--	--	--	--	--	--	1
102.6	2	3	--	--	--	--	--	--	--	--	--	--	1

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	A Textbook of Engineering Chemistry	12 th	S. S. Dara, S. S. Umare	S. Chand & Company Ltd., New Delhi.	2011
2	A Textbook of Engineering Chemistry	1 st	C. P. Murthy, C. V. Agarwal, A. Naidu	BS Publications, Hyderabad	2012
3	A Text Book of Engineering Chemistry	1 st	S. Chawla	Dhanpat Rai & Co. (Pvt.) Ltd, Delhi	2011
4	Engineering Chemistry	15 th	P.C.Jain	Dhanpat Rai & Co. (Pvt.) Ltd, Delhi	2015

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Chemistry of Engineering Materials	3 rd	R. P. Mani, K. N. Mishra	Cengage Learning	2015
2	Energy Storage and Conversion devices,	1 st	Anurag Gaur, A. L. Sharma, Anil Arya	CRC Press Taylor and Francis Group	2021
3	Engineering chemistry,	1 st	Shubha Ramesh et.al.	Wiley India	2011
4	Instrumental Methods of Chemical Analysis : Analytical Chemistry	6 th	Chatwal, Anand	Himalaya Pub. House, Mumbai	2010

Useful Link /Web Resources:

- <https://archive.nptel.ac.in/courses/122/106/122106028/#>
- <https://nptel.ac.in/courses/118104008>



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F. Y. B. Tech. Curriculum

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

Course Title: Applied Chemistry for Mechanical Engineering Laboratory	
Course Code: 41MEBSCP102	Semester: I
Teaching Scheme L-T-P: 00:00:02	Credits: 01
Evaluation Scheme ISE: 25	ESE: 00

Prior knowledge of:	Experiments based on titration, handling of glassware's & chemicals
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Course Objective:

1.	To test water quality parameters using various titration analysis methods
2.	To synthesize simple advanced materials and estimate concentration of elements in material
3.	To know handling of glassware's and simple equipment's for chemical analysis

List of experiments

Exp. No.	Title of experiments	Duration
1.	Determination of total hardness and of water sample by EDTA method (Complexometric titration)	02 Hrs
2.	Determination of acidity of given water sample using acid-base titration	02 Hrs
3.	Determination of alkalinity of given water samples	02 Hrs
4.	Determination of chloride content of water samples	02 Hrs
5.	Determination of p^H of given sample using p^H Meter	02 Hrs
6.	Analysis of alloy	02 Hrs
7.	Study of surface morphology of materials using SEM	02 Hrs
8.	Synthesis of metal oxide nanomaterials using solution combustion synthesis (Demonstration experiment)	02 Hrs
9.	Colorimetric estimation of copper	02 Hrs
10.	Ore analysis	02 Hrs
11.	Preparation of urea-formaldehyde resin	02 Hrs
12.	Preparation of phenol-formaldehyde resin	02 Hrs

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

CO	Statements
102.1	Analyze hardness, acidity, alkalinity and chloride content of water and percentage of elements in some alloys
102.2	Produce various advanced materials and analyze aqueous solutions using instruments
102.3	Perform various experiments by following written instructions
102.4	Express involvement by understanding concepts in applied chemistry

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
102.1	3	3	--	--	--	--	--	--	--	1	--	--	1
102.2	3	3	--	--	--	--	--	--	--	1	--	--	1
102.3	3	3	--	--	--	--	--	--	--	1	--	--	1
102.4	3	3	--	--	--	--	--	--	--	1	--	--	1

Suggested Learning Resources:

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Laboratory manual on Engineering Chemistry	1 st	S. K. Bashin, Dr. Sudha Rani	Dhanpat Rai Publishing Company Ltd., New Delhi	2012
2	Engineering Chemistry	15 th	P. C. Jain	Dhanpat Rai Publishing Company Ltd., New Delhi	2014
3	Engineering Chemistry Practical Book	4 th	Dr. Preeti Jain, Dr. S. L. Garg	Variety Books Publishers Distributors	2013
4	Engineering Chemistry : Theory and Practical's	1 st	N. Acharjee, P. Dhar	U. N. Dhur and Sons Private Limited	2020

Useful Link /Web Resources: <https://www.vlab.co.in/broad-area-chemical-sciences>



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F. Y. B. Tech. Curriculum

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

Course Title: Generative AI	
Course Code: 241MEESCL101	Semester: I
Teaching Scheme L-T-P: 03-00-00	Credits: 03
Evaluation Scheme ISE-I/MSE/ISE-II: 10/30/10	ESE Marks: 50

Prior knowledge of: Basics Knowledge of Computer

Course Objectives:

1.	To study basic principles of generative AI
2.	To study different types of generative models and their applications
3.	To give hands-on experiences with existing generative models and tools
4.	To explore ethical considerations and societal implications of generative AI technologies

Curriculum Details:

Course Contents	Duration
Unit 1: Introduction to Generative AI <ul style="list-style-type: none">• What is AI, History, what is Generative AI• Types of Generative models• AI Prompt Writing? Prompts, Type of Prompts• What is text-to-text Generative AI• General Rules for Prompt Writing• Generative language models• ChatGPT 3.5, ChatGPT4.0, Examples, Google Bard, Ethics in AI	7 Hrs
Unit 2: Prompt Engineering - NLP and ML Foundations <ul style="list-style-type: none">• Techniques for Prompt Engineering• Benefits of Prompt Engineering, what is NLP• What is ML, and examples• Common NLP Tasks - text Classification, language Translation,• Named Entity Recognition (NER)• Question answering, text Generation, sentiment analysis• Text summarization, recommendation systems	7 Hrs



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Course Contents	Duration
Unit 3: Tuning and Optimization Techniques <ul style="list-style-type: none">• Fine-tuning prompts• Prompt Tuning• Filtering and post-processing• Reinforcement learning• Use cases and applications• Pre-training• Designing effective prompts	7 Hrs
Unit 4: AI for Creative Applications <ul style="list-style-type: none">• Presentations gamma.ai• TL draw, AI overpowered tools• Image generation: Exploring tools like DALL-E and their creative applications like, generating concept art• product design ideas• Poem generator, video description• Music generation	7 Hrs
Unit 5: AI for Productivity Improvement <ul style="list-style-type: none">• Rytr for blog idea and outline, business idea pitch• Cover Letter, Job Description• Reply to reviews, Keyword Extractor, Tagline and Headlines etc• ResumeBuilding.com, Blog writing/ Text Summarization using Copy.ai• Image code - Blackbox	7 Hrs
Unit 6: Generative AI tools and Case Studies <ul style="list-style-type: none">• Hugging face transformers• OpenAI GPT3 API• Google cloud AI platform, Mid Journey, DALL E-2, Google Bard	7 Hrs



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Course Contents	Duration
<ul style="list-style-type: none"> • Case Studies – Token (API) Key generation on LLM (OpenAI, Google, Hugging face) in Google Colab • Hugging face demonstration of various models – image-to-text, • language translation, summarization • text generation, text-to-image • image-to-text, AI-Powered text and image generator, • Use of AI in word, power point and excel 	

Course Outcomes (CO):

Upon successful completion of this course, the students will be able to

101.1	Explain generative AI within the general history with context
101.2	Select appropriate models/tools based on the specific requirements of a given task or application
101.3	Classify different types of prompts
101.4	Generate creative content using generative AI techniques, including text, images, music etc
101.5	Develop the skill to build resume, Blog writing and Text Summarization
101.6	Develop strategies for responsibly deploying and managing generative AI systems considering issues like privacy, bias and misinformation

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO):

CO	PO												BTL
	1	2	3	4	5	6	7	8	9	10	11	12	
101.1	2	1	-	-	2	-	-	-	-	-	-	1	2
101.2	2	1	-	-	2	-	-	-	-	-	-	1	2
101.3	2	1	-	-	2	-	-	-	-	-	-	1	3
101.4	2	1	-	-	2	-	-	-	-	-	-	1	2
101.5	2	1	-	-	2	-	-	-	-	-	-	1	2
101.6	2	1	-	-	2	-	-	-	-	-	-	1	2



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Reference books:

Sr. No.	Title	Edition	Author	Publisher	Year
1.	Generative AI for everyone	First	Altaf Rehman	Bluerose publishers Pvt.Ltd.	2024
2.	Prompt Engineering for Generative AI	First	Jems Phoenix and mike Taylor	Shroff Publishers and Distributors Pvt. Ltd.	2024
3.	Generative AI For Beginners Playbook	First	Branson Adams	Walking Crow Publishing	2024
4.	Rise of Generative AI and ChatGPT	First	Utpal Chakraborty, Sumit Kumar and Soumyadeep Roy	BPB Publications	2023
5.	Applied Generative AI for Beginners	First	Akshay Kulkarni, Adarsha Shivananda, Anoosh Kulkarni and Dilip Gudivada	Apress	2023

Online Resources:

1. <https://www.deeplearning.ai/courses/generative-ai-for-everyone/>
2. <https://www.coursera.org/learn/introduction-to-generative-ai>
3. https://www.w3schools.com/gen_ai/gen_ai_prompt_intro.php
4. https://www.tutorialspoint.com/prompt_engineering/prompt_engineering_introduction.htm
5. <https://www.youtube.com/@AI.Overpowered>

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

Course Title: Generative AI Laboratory	
Course Code: 241MEESCP101	Semester: I
Teaching Scheme: L-T-P: 00-00-02	Credits: 01
Evaluation Scheme: ISE Marks: 25	ESE: 00

Prior knowledge of: Basics Knowledge of Computer

Course Objectives:

1.	To study basic principles of generative AI
2.	To study different types of generative models and their applications
3.	To give hands-on experiences with existing generative models and tools
4.	To explore ethical considerations and societal implications of generative AI technologies

List of Assignments / Practical's

Sr. No.	Name of Assignment	Duration
1	Suggesting 50 innovative ideas to increase sales and reduce costs (Assume suitable data)	2 Hrs
2	Citing references for an article	2 Hrs
3	Summarizing e mails/documents	2 Hrs
4	Resume generation	2 Hrs
5	Creative idea/Business presentation	2 Hrs
6	Examining the techniques used to construct a website or application	2 Hrs
7	Generate stories on a given prompt	2 Hrs
8	Image-to-text conversion	2 Hrs
9	Text to image	2 Hrs
10	Language Translation	2 Hrs
11	Blog writing	2 Hrs
12	Use of AI in word, Power point, and excel	2 Hrs


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Course Outcomes (CO):

Upon successful completion of this course, the students will be able to

101.1	Explain generative AI within the general history with context
101.2	Select appropriate models/tools based on the specific requirements of a given task or application
101.3	Classify different types of prompts
101.4	Generate creative content using generative AI techniques, including text, images, music etc
101.5	Develop the skill to build resume, Blog writing and Text Summarization
101.6	Develop strategies for responsibly deploying and managing generative AI systems considering issues like privacy, bias and misinformation

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO):

CO	PO												BTL
	1	2	3	4	5	6	7	8	9	10	11	12	
101.1	2	1	-	-	2	-	-	-	-	-	-	1	2
101.2	2	1	-	-	2	-	-	-	-	-	-	1	2
101.3	2	1	-	-	2	-	-	-	-	-	-	1	3
101.4	2	1	-	-	2	-	-	-	-	-	-	1	2
101.5	2	1	-	-	2	-	-	-	-	-	-	1	2
101.6	2	1	-	-	2	-	-	-	-	-	-	1	2


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F. Y. B. Tech. Curriculum

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

Course Title: Professional Communication	
Course Code: 241MEAECL101	Semester: I
Teaching Scheme L-T-P: 01-00-00	Credits: 01
Evaluation Scheme: ISE: 25	ESE: 00

Prior knowledge of:	Basic English Grammar, Basics of Communication
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Course Objectives:

1.	To make students learn important communicative situations, the basics of communication, and its significance in the corporate sector
2.	To sharpen listening, speaking, reading, and writing skills
3.	To facilitate them to draft office documents effectively
4.	To enhance career skills to make students industry-ready

Curriculum Details

Course Contents	Duration
Unit 1: Language and Communication <ul style="list-style-type: none"> • Need for effective communication, the process and levels of communication • Professional communication, communication networks/ flows • Forms and methods (verbal and non-verbal) of communication • Barriers to communication and solutions 	04 Hrs
Unit 2: Introduction to LSRW <ul style="list-style-type: none"> • Listening Skills: Hearing and listening, listening as an active skill; Types of listening; barriers to effective listening skills • Speaking Skills: Importance, various oral business contexts/situations, group communication, preparing effective public speeches (Impromptu and Prepared) • Reading Skills: Benefits of effective reading, Types of reading (Skimming; Scanning, Intensive reading, Extensive reading) overcoming common obstacles, Reading comprehension, Writing Skills: Importance, Paragraph writing techniques 	03Hrs
Unit 3: Professional Correspondence <ul style="list-style-type: none"> • Official correspondence 	04 Hrs



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Course Contents	Duration
Principles, structure (elements) Layout (complete block, modified block, semi-block), Types (enquiry and reply, claim and adjustment) <ul style="list-style-type: none">• Office drafting Writing notice, agenda, and minutes of the meeting• Email writing Advantages and limitations• Style, structure, and content, Email etiquette	
Unit 4: Career Skills and Ethics <ul style="list-style-type: none">• Resume and cover letter writing Types of resume Important features of selling resume Cover letter writing• Job Interviews Interview preparation FAQs (Frequently Asked Questions)• Guidance for IELTS, TOFEL and GRE, corporate etiquette and ethics	03 Hrs

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

CO	Statements
101.1	Implement verbal and non-verbal codes for effective communication
101.2	Demonstrate language learning skills- LSRW (Listening, Speaking, Reading, and Writing)
101.3	Compose business documents competently
101.4	Enhance employability and readiness for industry demand and career advancement

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Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
101.1	3	--	--	--	--	--	--	--	2	3	3	--	1
101.2	3	--	--	--	--	--	--	--	2	3	3	--	1
101.3	3	--	--	--	--	--	--	--	2	3	3	--	1
101.4	3	--	--	--	--	--	--	--	2	3	3	--	1

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Technical Communication: Principles & Practice	4 th	Meenakshi Raman & Sangita Sharma	Oxford University Press	2022
2	Personality Development & Soft-Skills	2 nd	Barun K. Mitra	Oxford University Press	2016
3	Communication Skills	2 nd	Sanjay Kumar & Pushp Lata	Oxford University Press	2015
4	Communication Skills	3 rd	Meenakshi Raman & Sangeeta Sharma	Oxford University Press	2013

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Business Communication	2 nd	Urmila Rai and S.M. Rai	Himalaya Publishing House Pvt. Ltd.	2014
2	A University Grammar of English	1 st	Randolph Quirk and S Greenbaum	Pearson	2007
3	Effective Technical Communication	2 nd	B. K.Mitra	Oxford University Press	2006
4	Effective Technical Communication	2 nd	M.Ashraf Rizvi	McGraw Hill Education	2005

Useful Links/Web Resources:

1. <https://www.skillsyouneed.com>
2. <https://www.psychologytoday.com>
3. <https://www.britishcouncil.in>
4. <https://www.udemy.com>
5. <https://www.englishclub.com>

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F. Y. B. Tech. Curriculum

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

Course Title: Professional Communication Laboratory	
Course Code: 241MEAEC101	Semester: I
Teaching Scheme L-T-P: 00-00-02	Credit: 01
Evaluation Scheme: ISE Marks: 25	ESE Marks: 00

Prior knowledge of:	Basic language learning and people skills
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Course Objectives:

1.	To familiarize students with English phonology and improve their pronunciation
2.	To improve language learning skills (LSRWT) by providing ample practice
3.	To develop students' verbal and non-verbal communication
4.	To cultivate creative thinking and workplace skills

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

CO	Statements
101.1	Demonstrate effective LSRW skills
101.2	Articulate words accurately and prepare grammatically correct sentences
101.3	Deliver speeches and participate in GDs, business meetings, and mock interviews effectively
101.4	Draft business documents and blogs by following writing ethics

Curriculum Details

Sr. No.	Title of Activities	Duration
1.	Icebreaking: Introducing self and others Different ways of introducing self and others: demonstration	02Hrs
2.	Phonetics Introduction to phonetics - consonants, vowels and diphthongs, stress, intonation in English with video samples	02Hrs
3.	Remedial English Vocabulary-building games and identifying errors revising rules of English grammar	02Hrs
4.	Listening Practice Listening comprehension, strategies for effective listening with audio/video samples	02Hrs
5.	Reading Practice Improving Comprehension Skills, Techniques for good comprehension	02Hrs
6.	Technical Writing Practice	02Hrs



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Sr. No.	Title of Activities	Duration
	Paragraph writing, writing notices, agenda minutes of the meeting, email writing	
7.	Public Speaking Practicing extempore and prepared speeches	02Hrs
8.	Group discussion Group discussions on current topics	02Hrs
9.	Mock Meetings Purposes, preparation, and procedure for conducting effective meetings	02Hrs
10.	Mock Interviews Preparing for FAQs and facing mock interviews	02Hrs
11.	Creative Writing Blog Writing	02Hrs
12.	Film/Book Appreciation Showing short films and appreciation of them. Reading novels or short stories and critical analysis of them	02Hrs

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

POs COs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
101.1	3	--	--	--	--	--	--	--	2	3	3	--	1
101.2	3	--	--	--	--	--	--	--	2	3	3	--	1
101.3	3	--	--	--	--	--	--	--	2	3	3	--	1
101.4	3	--	--	--	--	--	--	--	2	3	3	--	1

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	A Practical Course in Spoken English	1 st	J.K. Gangaj	PHI Learning Pvt. Ltd	2014
2	English Language Laboratories	2 nd	Nira Konar	PHI Learning Pvt. Ltd	2014
3	Better English Pronunciation	2 nd	J.D.O Connor	Cambridge University Press,	1980



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Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Communication Skills	2 nd	Sanjay Kumar & Pushp Lata	Oxford University Press	2015
2	Technical Communication: Principles and Practice	2 nd	Meenakshi Raman & Sangita Sharma	Oxford University Press	2011

Useful Links /Web Resources:

1. <https://www.indiabix.com>
2. <https://www.skillsyouneed.com>
3. <https://interviewbuddy.in>
4. <https://learnenglish.britishcouncil.org>
5. <https://www.fluentu.com>

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

Course Title: Computer Workshop	
Course Code: 241MEVSECL101	Semester: I
Teaching Scheme: L-T-P: 01-00-00	Credits: 01
Evaluation Scheme: ISE: 25	ESE Marks: 00

Prior Knowledge of:	Basic computer knowledge
----------------------------	--------------------------

Course Objectives:

1.	To get familiar with various hardware, software, operating systems and networking
2.	To identify and rectify the onboard computer hardware, software and network related problems
3.	To understand the hardware specifications that are required to run operating system and various application programs

Course Content:

Content	Duration
Unit 1: Computer Architecture Assembly of Computer <ul style="list-style-type: none">• Introduction to hardware peripherals like RAM, ROM, keyboard, Mouse, processors, etc.• Generation of processors• Working of SMPS• Study of various ports• Steps and precautions to assemble compute Computer Network Tools r <ul style="list-style-type: none">• Introduction to computer network• Study of various topologies• Preparing the network cable using crimping tools and connectors• Study of various network environments	07 Hrs
Unit 2: Operating System, Server and Internet Operating System and Software Installations <ul style="list-style-type: none">• Introduction to operating system	07 Hrs

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Content	Duration
<ul style="list-style-type: none"> • Types of operating system (Windows and Linux). • Window:-Evolution of operating system • Introduction to software. Types of software (MS office, VLC media player, Win RAR), etc. • Linux: Evolution of operating system • Introduction to software • Types of software (open office, web browser, etc.) • Case study of Installations step for operating system and application software's <p>Server</p> <ul style="list-style-type: none"> • Introduction to server • Difference between server and normal desktop • Evolution of servers • Study of various servers like Email, data, domain, etc. <p>Internet</p> <ul style="list-style-type: none"> • Introduction and evolution of internet • Study of various internet-based services like Email, social network, chat • Introduction to cyber security and cyber laws <p>Driver software installation</p>	

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

CO	Statements
101.1	Understand the basic concept and structure of computer hardware and networking
101.2	Identify the existing configuration of the computer and various restore operations on computer and update application software

Course Articulation Matrix: Mapping of course outcomes (CO) with program outcomes (PO)

PO CO	BTL	1	2	3	4	5	6	7	8	9	10	11	12
101.1	1	--	--	--	--	1	--	--	--	1	--	--	1
101.2	2	--	--	--	--	2	--	--	--	1	--	--	1


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Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1.	Hardware and Software of Personal Computers	1 st	Sanjay K. Bose	New Age International Private Limited	2014
2.	Fundamentals of Computers	6 th	V. Raja Raman	PHI Learning	2014
3.	Hardware Bible	6 th	Winn L. Rosch	QUE	2003

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1.	Introduction to Information Technology	2 nd	ITL Education Solutions limited	Pearson Education India	2012
2.	PC Hardware and A +Handbook	1 st	Kate Chase, Wiley Dreamtech	Microsoft Press US	2004
3.	Complete computer upgrade and Repair book	3 rd	Cheryl A Schmidt	Wiley Dreamtech	2002
4.	Introduction to Computers with MS-Office 2000	1 st	Alexis Leon & Mathews Leon	McGraw Hill Education	2001

Useful Link /Web Resources:

1. <https://turbofuture.com/computers/Dissassembling-and-Assembling-the-computer-system>
2. <https://www.computerhope.com/jargon/c/computer.html>
3. <https://www.pluralsight.com/blog/tutorials/troubleshooting-hardware>
4. [http://business.toshiba.com/downloads/KB/fIUlds/14047/SoftwareTrouble_EN_\(EBN\)_Ver01F.pdf](http://business.toshiba.com/downloads/KB/fIUlds/14047/SoftwareTrouble_EN_(EBN)_Ver01F.pdf)
5. https://oer.nios.ac.in/wiki/index.php/TYPES_OF_INTERNET_CONNECTIONS



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

Course Title: Computer Workshop Laboratory	
Course Code: 241MEVSECP101	Semester: I
Teaching Scheme: L-T-P: 00-00-01	Credit: 01
Evaluation Scheme: ISE: 25	ESE Marks: 00

Prior Knowledge of:	Basic computer knowledge
----------------------------	--------------------------

Course Objectives:

1.	To get familiar with various hardware, software, operating systems and networking
2.	To identify and rectify the onboard computer hardware, software and network related problems.
3.	To understand the hardware specifications that are required to run operating system and various application programs.

List of Experiments

Sr. No.	Title of Experiments	Duration
01	Desktop/laptop/server type identification and its specification.	02 Hrs
02	Introduction of computer architecture and components.	02 Hrs
03	Study of peripherals of a computer, components in a CPU and its functions.	02 Hrs
04	Study and demonstration of storage devices.	02 Hrs
05	A case study on Power Supply Unit (PSU) and its components.	02 Hrs
06	Introduction to basics of networking.	02 Hrs
07	Study of computer assembly and configuration.	02 Hrs
08	Assembling and disassembling of PC.	02 Hrs
09	Introduction to Operating System.	02 Hrs
10	Installation of Operating Systems – Windows.	02 Hrs
11	Installation of Operating Systems – LINUX.	02 Hrs
12	Installation of local and network printer.	02 Hrs


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Sr. No.	Title of Experiments	Duration
13	Configuring firewalls and installation of Antivirus software.	02 Hrs
14	Introduction to office automation software like MS Word, MS Excel, MS Power Point.	02 Hrs

Minimum 12 Experiments shall be conducted from above list.

Course Outcomes (CO): At the end of the course, the student should be able to

CO	Statements
101.1	Understand the basic concept and structure of computer hardware and networking
101.2	Identify the existing configuration of the computer and various restore operations on computer and update application software

Course Articulation Matrix: Mapping of course outcomes (CO) with program outcomes (PO)

CO \ PO	BTL	1	2	3	4	5	6	7	8	9	10	11	12
101.1	1	--	--	--	--	1	--	--	--	1	--	--	1
101.2	2	--	--	--	--	2	--	--	--	1	--	--	1

Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1.	Hardware and Software of Personal Computers	1 st	Sanjay K. Bose	New Age International Private Limited	2014
2.	Fundamentals of Computers	6 th	V. Raja Raman	PHI Learning	2014
3.	Hardware Bible	6 th	Winn L. Rosch	QUE	2003



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Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1.	Introduction to Information Technology	2 nd	ITL Education Solutions limited	Pearson Education, India	2012
2.	PC Hardware and A +Handbook	1 st	Kate Chase, Wiley Dreamtech	Microsoft Press, US	2004
3.	Complete computer upgrade and Repair book	3 rd	Cheryl A Schmidt	Wiley Dreamtech	2002
4.	Introduction to Computers with MS-Office 2000	1 st	Alexis Leon & Mathews Leon	McGraw Hill Education	2001

Useful Link /Web Resources:

6. <https://turbofuture.com/computers/Dissassembling-and-Assembling-the-computer-system>
7. <https://www.computerhope.com/jargon/c/computer.html>
8. <https://www.pluralsight.com/blog/tutorials/troubleshooting-hardware>
9. [http://business.toshiba.com/downloads/KB/fIUlds/14047/SoftwareTrouble_EN_\(EBN\)_Ver01F.pdf](http://business.toshiba.com/downloads/KB/fIUlds/14047/SoftwareTrouble_EN_(EBN)_Ver01F.pdf)
10. https://oer.nios.ac.in/wiki/index.php/TYPES_OF_INTERNET_CONNECTIONS

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F. Y. B. Tech. Curriculum

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

Course Title: Foundation of Mechanical Engineering-I	
Course Code: 241MEPCCL101	Semester: I
Teaching Scheme: L-T-P: 02-00-00	Credits: 02
Evaluation Scheme ISE-I/MSE/ISE-II: 10/30/10	ESE Marks: 00

Prior Knowledge of:	Basics of Physics & Chemistry
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Course Objectives:

1	To provide basic concept of thermodynamics
2	To make the students grasp the working principles of properties of pure substances
3	To perceive the concepts of steam condensers
4	To expose impulse and reaction steam turbine

Curriculum Details

Course Contents	Duration
Unit 1: Basic of Thermodynamics <ul style="list-style-type: none"> • Thermodynamic, system, boundary surrounding state • Process, cycle, thermodynamic system • Heat, work, internal energy, properties • Gas laws • First law of thermodynamics, application of first law to steady Flow processes, limitations of first law (Numerical Treatment) • Second law of thermodynamics 	08 Hrs
Unit 2: Properties of Pure Substances <ul style="list-style-type: none"> • Properties of steam • Difference between steam and gas • Steam formation • Types of steam • Enthalpy, specific volume, entropy (Definition Only) 	06Hrs

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Course Contents	Duration
Unit 3: Steam condensers <ul style="list-style-type: none">• Construction, & working functions, elements of condensing plant• Types of steam condensers• surface and jet condensers, comparison• vacuum efficiency, condenser efficiency (Definition only)• Loss of vacuum, sources of air leakages• Methods of leak detection	07 Hrs
Unit 4: Impulse and Reaction steam turbine <ul style="list-style-type: none">• Principles of operation• Classification, impulse and reaction steam turbine• Construction, & working functions impulse steam turbine• Construction, & working functions reaction steam turbine• Comparison between impulse and reaction steam turbine• Losses in steam turbines• Governing of steam turbines	07 Hrs

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

CO	Statements
101.1	Understand Basic of concept of thermodynamics
101.2	Understand Basic of concept of properties of pure Substances
101.3	Describe the principle of & working mechanism steam condensers
101.4	Describe the principle of & working mechanism impulse and reaction steam turbine

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Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

POs Cos	BTL	1	2	3	4	5	6	7	8	9	10	11	12
101.1	3	3	2	--	--	--	--	--	--	--	--	--	1
101.2	3	3	2	--	--	--	--	--	--	--	--	--	1
101.3	3	3	2	--	--	--	--	--	--	--	--	--	1
101.4	3	3	2	--	--	--	--	--	--	--	--	--	1

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering thermodynamics	4 th	P. K. Nag	Tata McGraw Hill Education	2019
2	Thermal Engineering	3 rd	R. K. Rajput	Laxmi Publications	2018

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Thermal Engineering	1 st	M.M Rathod	Tata McGraw Hill Education	2010
2	Steam & Gas Turbines	2 nd	R. Yadav	CPH Allahabad	2017

Useful Link /Web Resources:

- <https://archive.nptel.ac.in/courses/112/105/112105123/>
- <https://watch?v=pJM9Fh9Fp-I>
- <https://nptel.ac.in/courses/103107207>
- https://onlinecourses.nptel.ac.in/noc23_me08/preview

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F. Y. B. Tech. Curriculum

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

Course Title : Liberal Learning Course	
Course Code: 241MECCAP101 & 241MECCAP102	Semester: I / II
Teaching Scheme L-T-P : 00-00-04	Credits: 02
Evaluation Scheme ISE: 50	ESE Marks : 00

- Liberal Learning Through Students Clubs and particular areas is a Two-credit course run for First Year B.Tech .
- Students are required to go through the list of liberal learning courses and rank their preferences through google form/JUNO software provided by department at the beginning of semester.
- They will be allocated one area from the list. Experts from particular areas (club) conduct sessions once a week for each area on campus through activities, discussions, presentations, and lecture methods and evaluation out of 50 per area is done for each area throughout the semester.
- Evaluation pattern may differ according to the nature of each area (Club).
- Although there is no pre-defined syllabus, there is an outline which experts normally develop and follow for the sessions.
- However, students may approach the faculty to cover certain topics of their interest in that area during sessions based on students' interest and experts'.
- List of liberal learning courses will get display at the beginning of odd semester.

List of Liberal Learning Courses

Sr. No	Name of the Course
1.	Coding & Programming Club
2.	Photography Club
3.	Art, Craft and Culture Club
4.	German Language Club



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Sr. No	Name of the Course
5.	Yoga
6.	Meditation
7.	Adventure Club
8.	Interior Design
9.	Guitar
10.	Film Making
11.	Music
12.	Painting
13.	Dance
14.	Agriculture Club
15.	Corporate Culture Club
16.	Hotel Management Club
17.	Medical Club
18.	Art of Living Club
19.	Drama
20.	LinguLeads
21.	NCC/NSS
22.	Microsoft Club
23.	Robotics Club
24.	Health & Fitness Club
25.	Bookfast Club (Reading Club)
26.	Media Club
27.	Ted Club-GD, Public Speaking, Debate



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F. Y. B. Tech. Curriculum

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

Course Title: Finishing School Training-I	
Course Code: 241DSMCL101	Semester: I
Teaching Scheme: L-T-P :3-0-0	Credits: 00
Evaluation Scheme ISE: 50 Grade	ESE Marks: 00

Curriculum Details

Course Contents	Duration
UNIT-I: Learning Basic Aptitude Module-1: Percentage Module-2: Average & Its Applications	04 Hrs
UNIT-II: Series Completion Module-1: Number Series Module-2: Letter Series Module-3: Alphanumeric Series	04 Hrs
UNIT-III: LSRW-I Module-1. Listening Introduction & Activities Module- 2. Speaking Introduction & Activities Module-3. Reading Introduction & Activities Module-4. Writing Introduction	05 Hrs
UNIT-IV: Career Management-1 Module-1: SWOT Analysis Module-2: Goal Setting(Why & How of SMART goals) Module-3: Personality Traits & Self-Assessment Module-4: Competency Mapping	05 Hrs
UNIT-V: Interpersonal Skills Module-1: Team Management Module-2: Attitude Building Module-3: Time Management	05 Hrs
UNIT VI: Technical Training Module-1: Introduction to C Language Module-2: Identifiers & Data types, Operations Module-3: Control Instructions, Function, Recursion Module-4: Array, Strings, Pointers Module-5: Structure & Union Module-6: Memory Allocation Module-7: Enumeration, Pre-processor Module-8: Command Line Arguments	18 Hrs

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F. Y. B. Tech. Curriculum

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

Course Title: Rural/Social Internship	
Course Code: 241MEMCP102	Semester: I
Teaching Scheme: L-T-P :0-0-0	Credits: Grade (Mandatory Course)
Evaluation Scheme ISE: 50	ESE Marks: 00

Course Objectives:

1	To provide possible opportunities to learn, understand and sharpen the real time technical / managerial skills required at the job.
2	To exposure to the current technological developments relevant to the subject area of training.
3	To expose students to the engineer's responsibilities and ethics.
4	To understand the social, economic and administrative considerations that influence the working environment of industrial organizations
5	To gain experience in writing technical reports/projects.
6	To understand the social, economic and administrative considerations that influence the working environment of industrial organizations

Curriculum Details

As per the approved structure of curriculum, students will be allowed to do internship during first semester of B. Tech. program. During internship students are required to be visit village/ward/small industry/organization etc

For following activities

1. Prepare and implement plan to create local job opportunities.
2. Prepare and implement plan to improve education quality in village.
3. Preparing an actionable DPR for Doubling the village Income.
4. Developing Sustainable Water Management system.
5. Prepare and Improve a plan to improve health parameters of villagers.
6. Developing and implementing of Low Cost Sanitation facilities
7. Prepare and implement plan to promote Local Tourism through Innovative Approaches
8. Implement/Develop Technology solutions which will improve quality of life.
9. Prepare and implement solution for energy conservation.
10. Prepare and implement plan to Skill village youth and provide employment.
11. Develop localized techniques for Reduction in construction Cost.
12. Prepare and implement plan of sustainable growth of village.
13. Setting of Information imparting club for women leading to contribution in social and economic issues.
14. Developing and managing Efficient garbage disposable system.
15. Contribution to any national level initiative of Government of India. For eg. Digital India/ Skill India/ Swachh Bharat Internship etc

Every student is required to prepare a file containing documentary proofs of the activities done by him. The evaluation will be done by expert committee constituted by HoD/Departmental Internship In-charge/ faculty mentor.

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F. Y. B. Tech. Curriculum

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

Course Title: Numerical Techniques	
Course Code: 241MEBSCL103	Semester: II
Teaching Scheme: L-T-P : 03:00:00	Credits: 03
Evaluation Scheme ISE-I/MSE/ISE-II: 10/30/10	ESE Marks: 50

Prior Knowledge of:	Formulae of derivatives and integration, Differential equation.
----------------------------	---

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 equations and numerical techniques
4.	To imbibe graduates with mathematical knowledge, computational skills and the ability to deploy these skills effectively in solution of engineering problems

Curriculum Details

Course Contents	Duration
Unit 1: Numerical Differentiation <ul style="list-style-type: none">• Introduction• Newton's forward difference formula• Newton's backward difference formula• Stirling's central difference formula• Lagrange's interpolation formula	07Hrs
Unit 2: Numerical Integration <ul style="list-style-type: none">• Trapezoidal rule• Simpson's 1/3 rd rule• Simpson's 3/8 th rule• Weddle's rule	07Hrs
Unit 3 : Curve Fitting <ul style="list-style-type: none">• Fitting of curves by method of least-squares• Fitting of straight lines• Fitting of second degree parabolic curves	07Hrs



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Course Contents	Duration
<ul style="list-style-type: none">Fitting of exponential curves	
Unit 4 : Numerical Solutions of Algebraic & Transcendental equations <ul style="list-style-type: none">Introduction of algebraic and transcendental equationsBisection methodNewton-Raphson methodRegula-Falsi methodSecant method	07Hrs
Unit 5 : Vector Differential Calculus <ul style="list-style-type: none">Gradient of scalar point functionDirectional derivativeDivergence of vector point functionCurl of a vector point functionIrrotational, solenoidal and scalar potential function of a vector field	07Hrs
Unit 6 : Partial Differential Equations <ul style="list-style-type: none">Formation of partial differential equationMethod of separation of variablesWave equation and its solutionOne dimensional heat flow equationSolutions of Laplace equations by the Gauss – Seidel iterative method	07Hrs

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

CO	Statements
103.1	Calculate the derivative using interpolation formulae
103.2	Calculate numerical Integration
103.3	Describe the statistical data numerically by using curve fittings
103.4	Apply the numerical techniques to solve algebraic & transcendental equations
103.5	Apply knowledge of vector differentiation to find curl and divergence of vector fields
103.6	Use partial differential equation to solve the mechanical engineering problems



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Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

COs \ POs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
103.1	3	3	2	--	--	--	--	--	--	--	--	--	1
103.2	3	3	2	--	--	1	--	--	--	--	--	--	1
103.3	3	3	2	--	--	1	--	--	--	--	--	--	1
103.4	3	3	2	--	--	1	--	--	--	--	--	--	1
103.5	3	3	2	--	--	--	--	--	--	--	--	--	1
103.6	3	3	2	--	--	--	--	--	--	--	--	--	1

Text Books:

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

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Advanced Engineering Mathematics	5 th	Erwin Kreyszig	India Pvt, Ltd.	2014
2	Higher Engineering Mathematics	6 th	B.V.Ramana	Tata M/c GrawHill Publicatio	2010
3	Numerical Methods for Scientific and Engineering Computation	5 th	M.K.Jain	New Age International Pvt. Ltd New Delhi	0227
4	A Textbook of Engineering Mathematics	6 th	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>
4. https://www.youtube.com/results?search_query=Dr+Navneet+Sangle



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F. Y. B. Tech. Curriculum

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

Course Title: Numerical Techniques Tutorial	
Course Code: 241MEBSCT103	Semester: II
Teaching Scheme: L-T-P : 00-01-00	Credits: 01
Evaluation Scheme: ISE: 25	ESE Marks: 00

Prior Knowledge of:	Formulae of derivatives and integration, Differential Equation.
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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 differential equations and numerical techniques
4.	To imbibe graduates with mathematical knowledge, computational skills and the ability to deploy these skills effectively in solution of engineering problems

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

CO	Statements
103.1	Calculate the derivative using interpolation formulae
103.2	Calculate Numerical Integration
103.3	Describe the statistical data numerically by using curve fittings
103.4	Apply the numerical techniques to solve algebraic & transcendental equations
103.5	Apply knowledge of vector differentiation to find curl and divergence of vector fields
103.6	Use partial differential equation to solve the Mechanical engineering problems

List of Tutorials:

Sr. No.	Title of Tutorials	Duration
1.	Numerical Differentiation: Newton's forward difference formula, Newton's backward difference formula	01Hr
2.	Numerical Differentiation: Stirling's Central difference formula, Lagrange's interpolation formula	01Hr
3.	Numerical Integration: Trapezoidal Rule, Simpson's 1/3 rd Rule	01Hr



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Sr. No.	Title of Tutorials	Duration
4.	Numerical Integration: Simpson's 3/8 th rule , Weddle's Rule	01Hr
5.	Curve Fitting: Fitting of straight lines, fitting of second degree parabolic curves, Fitting of exponential curves	01Hr
6.	Curve Fitting using SCILAB/MATLAB	01Hr
7.	Numerical Solutions of Algebraic & Transcendental Equations: Bisection method, Newton-Raphson method	01Hr
8.	Numerical Solutions of Algebraic & Transcendental Equations: Regula-Falsi method, Secant method	01Hr
9.	Vector Differential Calculus: Gradient of scalar point function, directional derivative	01Hr
10.	Vector Differential Calculus: Divergence of vector point function, curl of a vector point function, irrotational, solenoidal and scalar potential function of a vector field	01Hr
11.	Partial Differential Equations: Wave equation and its solution, one dimensional heat flow equation, Solutions of Laplace equations by the Gauss – Seidel iterative method	01Hr
12.	Tutorial using SCILAB/MATLAB	01Hr

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

Cos	POs												
	BTL	1	2	3	4	5	6	7	8	9	10	11	12
103.1	3	3	2	--	--	1	--	--	--	--	--	--	1
103.2	3	3	2	--	--	1	--	--	--	--	--	--	1
103.3	3	3	2	--	--	1	--	--	--	--	--	--	1
103.4	3	3	2	--	--	1	--	--	--	--	--	--	1
103.5	3	3	2	--	--	--	--	--	--	--	--	--	1
103.6	3	3	2	--	--	--	--	--	--	--	--	--	1

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Text Books:

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

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Advanced Engineering Mathematics	5 th	Erwin Kreyszig	India Pvt, Ltd.	2014
2	Higher Engineering Mathematics	6 th	B.V.Ramana	Tata M/c GrawHill Publicatio	2010
3	Numerical Methods for Scientific and Engineering Computation	5 th	M.K.Jain	New Age International Pvt. Ltd New Delhi	0227
4	A Textbook of Engineering Mathematics	6 th	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>
4. https://www.youtube.com/results?search_query=Dr+Navneet+Sangle

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

Course Title: Physics or Mechanical Engineering	
Course Code: 241MEBSCL104	Semester: II
Teaching Scheme: L-T-P :03-00-00	Credits: 03
Evaluation Scheme ISE-I/MSE/ISE-II: 10/30/10	ESE Marks: 50

Prior knowledge of:	Elasticity, mechanics, surface tension, faraday laws
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Course Objectives:

1.	To provide basic concept of mechanical properties of material
2.	To expose physics behind fluid flow
3.	To make the students grasp the working principles Motors
4.	To find forces under free body diagram

Curriculum Details

Course Contents	Duration
Unit 1: Elastic Properties of Materials <ul style="list-style-type: none">• Concept of Stress (Normal & Shear Stress)• Strain (Linear, Lateral, Shear Volumetric)• Hooke's law, Poisson's ratio• Modulus of elasticity, modulus of rigidity, bulk modulus• Inter-relationship between elastic constants• Factor of safety• Composite sections and principle of superposition, Numerical	07 Hrs
Unit 2: Torsion, Shear force and Bending moment diagrams <ul style="list-style-type: none">• Torsion: Introduction to Torsion, Basic assumptions• Shear Force• Bending moment diagrams• Beam and its types• Types of loads and supports, Shear force	07 Hrs


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Course Contents	Duration
<ul style="list-style-type: none">Bending moment diagram for simply supported beams, cantilever and overhang beamsNumerical	
Unit 3: Fluid Mechanics <ul style="list-style-type: none">Fluid: definition, properties, applications, types and examplesPascal's law and its applicationsHydrostatic law of pressure, total pressureCentre of pressureBuoyancy, stability of floating and submerged bodiesMetacenter, Metacentric heightTypes of fluid flow: Streamline, Path line, streak line (Introduction), numerical	07 Hrs
Unit 4: Kinematics and Kinetics <ul style="list-style-type: none">Curvilinear motion, projectile motion, relative motionImpact: Direct, Indirect, Central and Eccentric impactNumerical on impactD'Alembert's principle, numericalApplication in-plane motion and connected body in pulley system	07 Hrs
Unit 5: DC Motors <ul style="list-style-type: none">Faraday laws of EMI, mutual induction, self-InductionConstruction, working, types, equivalent circuitBack emf, characteristics, power lossesApplications, reversal of rotationApplications DC servo motor, numericalStepper motor- desirable featuresTypes and applications	07 Hrs
Unit 6: Physics for Electronics <ul style="list-style-type: none">Introduction: AC and DC electricity, voltage, current, power, energy etc.Basic Electronics Circuits: resistors, capacitors, inductors, Ohm's Law	07 Hrs



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Course Contents	Duration
<ul style="list-style-type: none"> Faraday's law Series and Parallel Circuits Transformers: Single phase transformer: Construction, working, losses Three phase transformers: Construction and working Principle 	

Self-learning topic: Core and iron losses in transformers

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

CO	Statements
104.1	Explain elastical analysis of materials for engineering applications
104.2	Use the classical mechanics for moment diagrams
104.3	Apply the fluid flow mechanics for liquids
104.4	Apply laws of mechanics for system of motions of bodies
104.5	Identify the physical parts of the DC machines
104.6	Describe electronic devices using electromagnetic induction law

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

CO \ PO	BTL	1	2	3	4	5	6	7	8	9	10	11	12
104.1	2	3	2	--	--	--	--	--	--	--	--	--	1
104.2	3	3	2	--	--	--	--	--	--	--	--	--	1
104.3	3	3	2	--	--	--	--	--	--	--	--	--	1
104.4	3	3	2	--	--	--	--	--	--	--	--	--	1
104.5	2	3	1	--	--	--	--	--	--	1	--	--	1
104.6	3	3	1	--	--	--	--	--	--	1	--	--	1

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Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1.	Engineering Physics	1 st	H. K. Malik	Tata McGraw Hill Education	2019
2.	Basic Electronics	19 th	B.L. Theraja	S. Chand	2007
3.	A Text Book of Engineering Physics	Revised	M. N. Avadhanulu, P. G. Kshirasagar	S. Chand Publications	2018
4.	Engineering Physics	Revised	L.N. Singh	Synergy Knowledge Ware	2016
5.	Engineering Physics	Revised	V. Rajendran	Tata McGraw Hill Education	2010
6.	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.	Introduction to Solid State Physics	8 th	Charles Kittel	John Willey and Sons Inc.	2009
4.	Solid State Physics	6 th	S.O.Pillai	New edge Internationals	2009
5.	Engineering Mechanics	3 rd	S.S. Bhavikatti	New Age International (P) Ltd.	2010

Useful Link /Web Resources:

1. <http://hyperphysics.phy-astr.gsu.edu/hbase/index.html>
2. https://en.wikipedia.org/wiki/Wave_interference
3. https://en.wikipedia.org/wiki/Introduction_to_quantum_mechanics

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

Course Title: Physics for Mechanical Engineering Laboratory	
Course Code : 241MEBSCP104	Semester: II
Teaching Scheme: L-T-P: 00-00-02	Credit: 01
Evaluation Scheme: ISE: 25	ESE Marks: 00

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

1.	To make the students understand the concept of physics for the effective application in the field of engineering and technology
2.	To use the knowledge of electron transport in semiconductors
3.	To summarize the factors affecting forces acting on bodies in classical mechanics

List of Experiments-

Exp. No	Title of Experiments	Duration
1.	To verify Pascal's law experiment	02Hrs
2.	To verify Hooks law experiment	02 Hrs
3.	To determine coefficient of viscosity	02Hrs
4.	To calculate Young's modulus by bending beam	02Hrs
5.	To determine Rigidity Modulus of the suspension wire by Torsional pendulum	02Hrs
6.	To measure Hydrostatic pressure measurement	02Hrs
7.	To determine the velocity of the ultrasonic wave in water using ultrasonic interferometer	02Hrs
8.	To study viscosity by using capillary action flow method	02Hrs
9.	To find Reynolds number using Reynolds experiment	02Hrs
10.	To test the electronic components experiment (resisters, capacitors, inductor, diode, transistor, LED and switches using multimeter)	02Hrs
11.	Assignment on pressure measuring devices	02Hrs
12.	Assignment on bending and shear stress	02Hrs



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

CO	Statements
104.1	Apply laws of mechanics for system of motions of bodies
104.2	Explain elastically properties of materials
104.3	Explain ultrasonic interferometer to study velocity of ultrasound in given Liquid
104.4	Interpret knowledge related to electrical and electronic devices

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

PO CO	BTL	1	2	3	4	5	6	7	8	9	10	11	12
104.1	2	3	--	--	--	1	--	--	--	--	--	--	1
104.2	2	3	--	--	--	1	--	--	--	--	--	--	1
104.3	2	3	--	--	--	1	--	--	--	--	--	--	1
104.4	2	3	--	--	--	1	--	--	--	--	--	--	1

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 Mechanics	3 rd	S.S. Bhavikatti	New Age International (P) Ltd.	2010
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>

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F. Y. B. Tech. Curriculum

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

Course Title: Computer Programming and Problem Solving	
Course Code: 241MEESCL102	Semester: II
Teaching Scheme: L-T-P :03-00-00	Credits: 03
Evaluation Scheme: ISE-I/MSE,/ISE-II:10/30/10	ESE Marks: 50

Prior Knowledge of:	Basic knowledge of computers
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Course Objectives:

1.	To acquire basic principles of problem-solving using computers
2.	To learn and use syntax of C programming language to solve basic science and engineering problems
3.	To select appropriate programming constructs, data structures and functions to build solutions to variety of problems

Curriculum Details

Course Contents	Duration
Unit 1: Introduction to C programming <ul style="list-style-type: none"> Fundamentals of algorithms, flowcharts Getting started with C- Basic structure of C program, features of C language, Character set, C tokens, Keywords and Identifiers, Data types and Format Specifier Managing Input and Output operations Variables-Local and Global variables, rules for defining a variable name, variable initialization-Run time and compile time, variable declaration Constants-Defining Constant by using preprocessor directive and keyword const Operators- Arithmetic operators, Relational operators, Logical Operators, Assignment operators, Increment and Decrement operators, Conditional operators, Bit-wise operators, Special operators. Operator precedence and Associativity 	07 Hrs
Unit 2: Programming Constructs <ul style="list-style-type: none"> Need of Decision-making statements- Simple 'if' statement, the 'if...else' statement, nesting of 'if...else' statements, the 'else if' ladder, the 'switch' statement, break statement, the 'go to' statement Need of looping statements: The 'for', 'while', 'do-while' loop with examples 	07 Hrs

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Course Contents	Duration
<p>Unit 3: Arrays & Strings</p> <ul style="list-style-type: none">• Arrays-Types of arrays, declaration arrays, initializing arrays (One Dimensional and Two-Dimensional Array)-Run time Initialization and Compile time Initialization with examples.• Character Arrays and Strings- Declaration and Initialization- Run time Initialization and Compile time Initialization with examples, reading string from terminal and writing strings to screen, String handling Functions- strcpy(), strcmp(), strlen(), strcat().	07Hrs
<p>Unit 4: Structures and Unions:</p> <ul style="list-style-type: none">• Structures-Elements of Structure: Structure definition, declaring structure variables, Structure initialization. Accessing structure members by using '.' Operator, Arrays of structure, Arrays within structures.• Unions- Elements of Union: Union definition, declaring union variables, Union initialization, Comparison of Structure and Unions.	07Hrs
<p>Unit 5: Functions</p> <ul style="list-style-type: none">• Need for Functions, Types of functions (User Defined and Built -In)• User defined Function-Elements of UDF-Function Definition, Function declaration, Function call. Actual Parameters, Formal Parameters• Categories of functions-With Argument and with return value, No Argument and with return value, With Argument and No return value, No Argument and No return value. Storage classes (Automatic, Static, Extern, and Register). Passing arrays to a function, Structures and Functions, Recursion	07Hrs
<p>Unit 6: Pointers:</p> <ul style="list-style-type: none">• Introduction to Pointers, accessing a value of variable by using Pointers- Declaration of Pointer variable, Initialization of pointer variables, Dereference operator.• Pointers as function arguments-Call by value and call by reference.• Pointers Expression,• Pointers and Arrays, Pointers and Strings, Pointers to Functions, Pointers and structures	07Hrs

Self-learning topic: Recent trends in IT

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

CO	Statements
102.1	Describe the basic structure of C program and use of different data type
102.2	Develop conditional and Loop statements to write C programs
102.3	Explain the concept of arrays and strings to store homogeneous data
102.4	Use functions to break programs into small module
102.5	Explain concept of structures and union
102.6	Use pointers to access memory location

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes(PO)

Cos	POs	BTL	POs											
			1	2	3	4	5	6	7	8	9	10	11	12
102.1		2	3	3	2	--	--	--	--	--	--	--	--	1
102.2		2	3	3	2	--	--	--	--	--	--	--	--	1
102.3		2	3	3	2	--	--	--	--	--	--	--	--	1
102.4		2	3	3	2	--	--	--	--	--	--	--	--	1
102.5		2	3	3	2	--	--	--	--	--	--	--	--	1
102.6		2	2	2	2	--	--	--	--	--	--	--	--	1

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Programming in ANSI C	8 th	E. Balagurusamy	McGraw Hill Education	2019
2	Let Us C	16 th	Yashwant Kanetkar	BPB Publication	2017

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Programming with ANSI And Turbo C	-	Ashok Kamthane	Pearson Education	2002
2	Programming in C	2 nd	J.B Dixit	Firewal Media	2011
3	The Complete Reference Edition	4 th	Herbert Schildt	McGraw-Hill Education	2017

Useful Link /Web Resources:

<https://nptel.ac.in/courses/1061041282>.

<https://www.udemy.com/courses>

<https://www.coursera.org>

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F. Y. B. Tech. Curriculum

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

Course Title: Computer Programming and Problem Solving Laboratory	
Course Code: 241MEESCP101	Semester: II
Teaching Scheme: L-T-P:00-00-02	Credit : 01
Evaluation Scheme: ISE: 25	ESE: 00

Prior Knowledge of:	Basic knowledge of computers
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Course Objectives:

1.	To Develop the ability to analyze a problem, develop an algorithm to solve it
2.	To Understand the concept of a program in a high-level language how it is being translated by a compiler into machine language and then executed
3.	To impart concept like looping, array, functions, structure and unions

List of experiments:

Exp. No.	Title of experiments	Duration
01	Study different IDE's used for C programming	02 Hrs.
02	Write C Program/s to explore data types.	02 Hrs.
03	Write C Program/s to explore constants and variables.	02 Hrs.
04	Write C Program to perform arithmetic, logical and relational operators.	02 Hrs.
05	Write C Program using simple control statements: If-else, Do-while.	02 Hrs.
06	Write C Program using loops statement.	02 Hrs.
07	Write C Program using switch statement.	02 Hrs.
08	Write C Program using arrays: Declare and initialization of arrays.	02 Hrs.
09	Write C Program to demonstrate User defined Functions.	02 Hrs.
10	Write C Program to demonstrate structures.	02 Hrs.
11	Write C Program to demonstrate unions.	02 Hrs.
12	Write C Program to demonstrate use of Pointers.	02 Hrs.

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

CO	Statements
102.1	Understand the logic for given problem and provide the solution.
102.2	Explain syntax and construction of C programming.
102.3	Describe the methods of iteration or looping and branching.
102.4	Make use of different data structures like Arrays, Structures, and Unions.

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

Cos	PO's	BTL	POs											
			1	2	3	4	5	6	7	8	9	10	11	12
102.1		2	1	1	1	--	--	--	--	--	--	--	--	1
102.2		2	1	1	1	--	--	--	--	--	--	--	--	1
102.3		2	1	1	1	--	--	--	--	--	--	--	--	1
102.4		2	1	1	1	--	--	--	--	--	--	--	--	1

Suggested Learning Resources: --

Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Programming in ANSI C	Eight Edition	E. Balagurusamy	McGraw Hill Education	2019
2	Let Us C	16th	Yashwant Kanetkar	BPB Publication	2017

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Programming with ANSI And Turbo C	Revised	Ashok Kamthane	Pearson Education	2002
2	Programming in C	2 nd	J.BDixit	Firewal Media	2011
3	The Complete Reference Edition	4 th	Herbert Schildt	McGraw-Hill Education	2017

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

Course Title: Computer Aided Machine Drawing	
Course Code: 241MEESCL103	Semester: II
Teaching Scheme: L-T-P: 03-00-00	Credits: 03
Evaluation Scheme: ISE1/MSE/ISE2: 10/30/10	ESE Marks: 50

Prior knowledge of :	Fundamentals of drawing
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Course Objectives:

1	To impart basic drawing standards and conventions
2	To impart basic knowledge and skills required to prepare engineering drawings
3	To enable them to use computer aided drafting tools to prepare drawings
4	To Visualize and present the orthographic and isometric views with proper dimension and scale
5	To provide knowledge of detail drawing and assembly drawing procedure

Curriculum Details :

Course Contents	Duration
Unit 1: Fundamentals of Engineering Drawings <ul style="list-style-type: none">• Introduction to Drawing instruments and their uses. Layout of drawing sheets, different types of lines used in drawing practice BIS conventions for sectioning.• Projections of Solids: Projection of regular Solids such as Prisms, pyramids, cylinder and cone with their axis inclined to both HP and VP.• Free hand sketches Flat and V-belt pulleys. Speed cone pulley. Standard pipe fittings. Various types of riveted joints, Foot step bearing, fast and loose pulley, Types of keys.	09 Hrs



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Course Contents	Duration
Unit 2: Introduction to Computer Aided Sketching <ul style="list-style-type: none">• Introduction to CAD software• Graphical User interface of CAD software• Selection of Drawing size and scale• Standard Toolbars• Menus, Tabs, navigational tools, Basic Commands to draw 2D objects• Co-ordinate system and planes• Viewing Commands• Edit & Modify Commands, Dimensions• Lettering, Annotations as per BIS conventions• Changing length through modifying existing line Plotting	10 Hrs
Unit 3: Dimensional and Geometric Tolerances <ul style="list-style-type: none">• Dimensioning system as per BIS (Theoretical treatment only)• Significance and importance of BIS Conventions, Conventional representation of engineering materials, Significance of limit systems, terminology• types of fits, Recommendations and selections, Dimensional Tolerances, IT grades and fundamental deviation details, geometric tolerances	04 Hrs
Unit 4: Orthographic Views <ul style="list-style-type: none">• Principles of Orthographic Projections,• Types of orthographic projections–first angle and third angle projections,• Obtaining orthographic projections of given pictorial views by using first angle projection method along with sectional views, dimensioning and sections	07 Hrs
Unit 5: Isometric Projections <ul style="list-style-type: none">• Introduction to Isometric• Isometric scale• Isometric projections• and Isometric views / drawings• Circles in isometric view• Isometric views of simple solids• Isometric views of simple objects	07 Hrs

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Course Contents	Duration
<p>Unit 6: Assembly and Details Drawings</p> <ul style="list-style-type: none"> Meaning and use of machine drawing. Purpose of making assembly and detail drawings Classification of machine drawing production drawings, working drawings. Practice in making assembly and detail drawings of units, giving dimensions with limits fits and tolerances. (Indicative list for assembly, details drawing) Engine parts and other machine parts – stuffing boxes machine vices, simple press tool assembly etc. 	08 Hrs

Course Outcomes (CO): At the end of the course the student should be able to

CO	Statement
103.1	Understand basic fundamentals of engineering drawing.
103.2	Prepare 2-D drawings with appropriate dimensional and geometrical tolerances
103.3	Understand modern engineering tools used for engineering drawing.
103.4	Prepare drawing for orthographic projection.
103.5	Prepare drawing for isometric projection.
103.6	Produce assembly and details drawings from given standard machine components.

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

COs \ POs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
103.1	3	3	2	--	--	3	--	--	--	--	--	--	--
103.2	3	3	2	--	--	3	--	--	--	--	--	--	--
103.3	3	3	2	--	--	3	--	--	--	--	--	--	--
103.4	3	3	2	--	--	3	--	--	--	--	--	--	--
103.5	3	3	2	--	--	3	--	--	--	--	--	--	--
103.6	3	3	2	--	--	3	--	--	--	--	--	--	--



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Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering Graphics with Auto CAD	13 th Edition	D. M. Kulkarni, A. P. Rastogi	(PHI) Publisher	2010
2	Computer Aided Engineering Drawing	3 rd Edition	S. Trymbaka Murthy	I.K. International Publishing House	2013
3	Machine Drawing	18 th	P. S. Gill	S.K. Kataria & Sons	2002
4	Machine Drawing	Revised	N. D. Bhatt	Charotor Publication House	2001

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Fundamentals of Physics	3rd	French and Vierck	Mc-Graw Hill International	1970
2	Working with AutoCAD 2000	--	Ajeet Sing	Cengage Learning Publications	2012
3	Machine Drawing	5th	K. L. Narayana	New Age Publication	2016
4	Engineering Drawing and Graphics	5th	K. Venugopal	New Age Publication	2004
5	Engineering Drawing	2 nd	N. B. Shaha and B.C. Rana	Pearson Education	2009

Online Resources:

- <https://archive.nptel.ac.in/courses/112/105/112105294/>
- <https://archive.nptel.ac.in/courses/112/104/112104172/>
- <https://archive.nptel.ac.in/courses/112/102/112102304/>
- <https://nptel.ac.in/courses/112103019>

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

Course Title: Computer Aided Machine Drawing Laboratory	
Course Code: 241MEESCP103	Semester: II
Teaching Scheme: L-T-P: 00-00-02	Credits: 01
Evaluation Scheme: ISE: 25	ESE: 00

Prior knowledge of:	Fundamentals of drawings
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Course Objectives:

1.	To enable them to use computer aided drafting tools to prepare drawings
2.	To bring awareness that engineering drawing is the language of engineers
3.	To impart basic knowledge and skills required to prepare engineering drawings
4.	To Visualize and present the orthographic and isometric views with proper dimension and scale
5.	To provide knowledge of detail drawing and assembly drawing procedure

List of Experiments:

Sr. No.	Name of Experiment	Duration
1	BIS convention sheet (should be drawn manually on A2 size drawing sheets)	02 Hrs
2	Free hand Sketching of various machine Components (should be drawn manually on A2 size drawing sheets)	02 Hrs
3	Introduction of basic CAD software commands	02 Hrs
4	Use and practice of Customization & Annotations	02 Hrs
5	Draw Basic Drawings	02 Hrs
6	Draw Basic Drawings	02 Hrs
7	Draw problems on Orthographic views (Object 1)	02 Hrs
8	Draw problems on Orthographic views (Object 2)	02 Hrs



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9	Draw problems on Sectional Orthographic views	02 Hrs
10	Draw problems based on Isometric projections (Object 1)	02 Hrs
11	Draw problems based on Isometric projections (Object 2)	02 Hrs
12	Drawing Assembly with bill of material – Assembly 1	02 Hrs
13	Drawing Assembly with bill of material – Assembly 2	02 Hrs
14	Draw detail drawing of assembly 1	02 Hrs
15	Draw detail drawing of assembly 2	02 Hrs

Minimum 12 Experiments shall be conducted from above list.

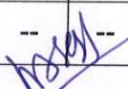
Course Outcomes (CO):

At the end of the course the student should be able to

CO	Statement
103.1	Understand basic fundamentals of engineering drawing
103.2	Prepare 2-D drawings with appropriate dimensional and geometrical tolerances
103.3	Understand modern engineering tools used for engineering drawing
103.4	Prepare drawing for orthographic projection
103.5	Prepare drawing for isometric projection
103.6	Prepare assembly and details drawings from given standard machine components

Course Articulation Matrix: Mapping of Course Outcomes (CO) with Program Outcomes (PO)

COs \ POs	BTL	POs											
		1	2	3	4	5	6	7	8	9	10	11	12
103.1	2,3	3	2	--	--	3	--	--	--	--	--	--	--
103.2	2,3	3	2	--	--	3	--	--	--	--	--	--	--
103.3	2,3	3	2	--	--	3	--	--	--	--	--	--	--
103.4	2,3	3	2	--	--	3	--	--	--	--	--	--	--
103.5	2,3	3	2	--	--	3	--	--	--	--	--	--	--
103.6	2,3	3	2	--	--	--	--	--	--	--	--	--	--


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Text Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Engineering Graphics with Auto CAD	13 th Edition	D. M. Kulkarni, A. P. Rastogi	(PHI) Publisher	2010
2	Computer Aided Engineering Drawing	3 rd Edition	S. Trymbaka Murthy	I.K. International Publishing House	2013
3	Machine Drawing	18th 2013	P. S. Gill	S.K. Kataria & Sons	2002
4	Machine Drawing	Revised	N. D. Bhatt	Charotor Publication House	2001

Reference Books:

Sr. No	Title	Edition	Author(s)	Publisher	Year
1	Fundamentals of Physics	3rd	French and Vierck	Mc-Graw Hill International	1970
2	Working with AutoCAD 2000	--	Ajeet Sing	Cengage Learning Publications	2012
3	Machine Drawing	5th	K. L. Narayana	New Age Publication	2016
4	Engineering Drawing and Graphics	5th	K. Venugopal	New Age Publication	2004
5	Engineering Drawing	2 nd	N. B. Shaha and B.C. Rana	Pearson Education	2009

Online Resources:

- <https://archive.nptel.ac.in/courses/112/105/112105294/>
- <https://archive.nptel.ac.in/courses/112/104/112104172/>
- <https://archive.nptel.ac.in/courses/112/102/112102304/>
- <https://nptel.ac.in/courses/112103019>



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Course Title: Design Thinking Through Innovation	
Course Code: 241CSEVSECL102	Semester: II
Teaching Scheme: L-T-P: 01-00-00	Credits: 01
Evaluation Scheme: ISE: 25	ESE Marks: 00

Prior Knowledge of:	Understanding, user-centric mindset, collaboration and teamwork, curiosity and open-mindedness, effective communication skills, learning orientation, risk tolerance
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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 prototypes and the techniques used for prototyping

Curriculum Details:

Course Content	Duration
Unit 1: Engineering design, design thinking, and idea generation <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	07 Hrs

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Course Content	Duration
<p>Unit 2: 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 and 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), spanners, allen key & wrench (flat, ring, adjustable), solder gun, component cutter, tweezer, multi meter, glue gun, hex saw, cutter, wire stripper 	07 Hrs

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

CO	Statements
102.1	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
102.2	Understand the various types of prototypes and Inculcate the techniques used for prototyping

Course Articulation Matrix: Mapping of course outcomes (CO) with program outcomes (PO)

CO \ PO	PO												
	BTL	1	2	3	4	5	6	7	8	9	10	11	12
102.1	1	2	--	--	--	--	--	--	--	--	--	--	1
102.2	2	2	1	--	--	--	--	--	1	--	--	1	1

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Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	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:

1. <https://www.ideo.com/pages/design-thinking>
2. <https://dschool.stanford.edu/>
3. <https://www.designthinkersacademy.com/usa/>
4. <https://www.ibm.com/design/thinking/page/toolkit>
5. <https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo>

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Course Title: Design Thinking Through Innovation Laboratory	
Course Code: 241CSEVSECP102	Semester: II
Teaching Scheme: L-T-P: 00-00-01	Credit: 01
Evaluation Scheme: ISE: 25	ESE Marks: 00

Prior Knowledge of:	Understanding, user-centric mindset, collaboration and teamwork, curiosity and open-mindedness, effective communication skills, learning orientation, risk tolerance
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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

Sr. No.	Title of Experiments	Duration
1.	Overview of design thinking: ethical design and critiques, generation of "Idea", problem identification and exercises	02 Hrs
2.	Brainstorming sessions to find out solution for identified problems	02 Hrs
3.	Prototyping and modelling challenge, various tools and methodology used for the prototyping	02 Hrs
4.	Hands-on demonstration of different tools used for design & innovation	02 Hrs
5.	Hands-on demonstration of soldering machine, function and purpose of soldering machine	02 Hrs
6.	Explanation and usage of joining & insulation tools and technics	02 Hrs
7.	Assembly and disassembly of two wheel drive robot based vehicle	02 Hrs
8.	Micro project: group formation and idea generation	02 Hrs



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Sr. No.	Title of Experiments	Duration
9.	Creation of prototype and innovative solution	02 Hrs
10.	Test and evaluation of prototype	02 Hrs
11.	Report drafting - instructions & practices	02 Hrs
12.	Presentation & exhibition	02 Hrs

Course Outcomes (CO):

At the end of the course, the student should be able to

CO	Statements
102.1	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
102.2	Understand the various types of prototypes and Inculcate the techniques used for prototyping

Course Articulation Matrix: Mapping of course outcomes (CO) with program outcomes (PO)

COs \ POs	BTL	1	2	3	4	5	6	7	8	9	10	11	12
		102.1	1	2	--	--	--	--	--	--	--	--	--
102.2	2	2	1	--	--	--	--	--	1	--	--	1	1

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Suggested Learning Resources:

Text Books:

Sr. No	Title	Edition	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)	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:

1. <https://www.ideo.com/pages/design-thinking>
2. <https://dschool.stanford.edu/>
3. <https://www.designthinkersacademy.com/usa/>
4. <https://www.ibm.com/design/thinking/page/toolkit>
5. <https://hbr.org/2018/09/design-thinking-is-fundamentally-conservative-and-preserves-the-status-quo>

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Course Title: Historical Places in and Around Kolhapur District	
Course Code : 241MEIKSL101	Semester: II
Teaching Scheme L-T-P : 02-00-00	Credits: 02
Evaluation Scheme ISE-I, MSE, ISE-II: 20/30/00	ESE Marks: 00

Contents	Duration
Unit 01: Chhatrapati Shahu Maharaj: A King for Society <ul style="list-style-type: none">• Introduction• Life History• Contribution of Rajarshi Shahu Maharaj in various fields as a modern Social Reformer as Women Empowerment in 19th Century• Development in Education• Social Reservation and equality• Agriculture• Industry• Initiation for Radhanagai Village and Dam	07 Hrs
Unit 02: A Study of Khidrapur- Kopeshwar <ul style="list-style-type: none">• Life History of Khidrapur Kopeshwar Temple• The Wonder of Khidrapur Kopeshwar Temple• Swarga Mandap in Kopeshwar Temple• Sabha Mandap, Antaral Kaksha of Kopeshwar Temple• Beauty of Exterior Architecture of Kopeshwar Temple• Mystery of Black stone• Measures Suggested to Development of Khidrapur	07 Hrs
Unit 03 : A Study of Panhala Fort and Pawankhind <ul style="list-style-type: none">• History of Panhala Fort• Major Features: Andhar Bawadi• Major Features: Kalavanticha Mahal, Ambarkhana• Major Features: Dharma Koti, Sajja Koti	07 Hrs

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Contents	Duration
<ul style="list-style-type: none">• Teen Darwaja, Raj Darwaja• Rajdindi Bastion• Journey from Panhalgad to Pawankhind by Chhatrapati Shivaji Raje	
Unit 04: A Study of Mahalaxmi Temple <ul style="list-style-type: none">• History and construction of Temple• The Main Shrines Doorway• Darshan and Kurma Mandap• Ganapati Chowk, Garud Mandap• Boundary wall, Entrances and complex• Mahalaxmi Temple Timings• Kiranostav Celebrations	07 Hrs

References:

1. Social Movements in India: A Review of Literature – Ghanshyam Shah ISBN 0761995145 New Delhi ; Thousand Oaks : Sage Publications, 2004.
2. Rajarshi Shahu Maharaj – Jeevan Vakarya, editor – Ramesh Patnaje.
3. Shahu Chhatrapati - Royal Revolutionary – Dhananjay Keer.
4. Samajik Sanshodhan Padnativa Tandre – Dr. Pradeep Aaglave.
5. Kalasekar. T. L: Khidrapur: Khojura of Maharashtra.
6. Chothe R.G: Temples of Khidrapur, A heritage of India.
7. Kulkarni A. B: Kopeswar temple of Khidrapur.
8. Gazetteer of Kolhapur District.
9. Eaton, Richard Maxwell (2005). The New Cambridge History of India.
10. "Translations of Panhala inscriptions". Government of Maharashtra. Retrieved 19 March 2009.
11. "Mahalakshmi Temple - Jewel Among Kolhapur Temples.
12. "Inside Temples". mahalaxmikolhapur.com.

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Course Title: Finishing School Training-II	
Course Code: 241MEMCL103	Semester: II
Teaching Scheme: L-T-P :3-0-0	Credits: 00
Evaluation Scheme ISE: 50 Grade	ESE Marks: 00

Curriculum Details

Course Contents	Duration
UNIT-I: Learning Basic Aptitude Module-1: Ratio & Proportion Module-2: Mixture & Alligation Module-3: HCF & LCM	06 Hrs
UNIT-II: Logical Reasoning Module-1: Blood Relations Module-2: Seating Arrangement Module-3: Pattern Completion	06Hrs
UNIT-III: Functional English Module-1: Spotting Errors, Sentence Correction/ Sentence Improvement Module-2: Sentence completion Module-3: Sentence Formation/ Ordering of words Module-4: One word Substitution Module-5: Para jumbles	10 Hrs
UNIT-IV: Attitude Building-I Module-1. Focus & Discipline Module-2. ASK Model- Corporate Expectations Module-3. Change Management (Changing & Developing habits)	06 Hrs
UNIT-V: Technical Training Module-1: C++ Introduction-History of C++,C++ specifications and keywords, Data type and its type, type modifiers and qualifiers,Structure in C/C++, access specifier, Memory Allocation Functions-simple programs. Module-2: Creating Classes and Objects-Access Specifiers,Constructor,Types of Functions Member Functions-Internally Defined, Externally Defined,Inline Function,Friend Function Virtual Function Introduction,Nesting of Member Functions Module-3 - Functions-Function Arguments- Call by Value, Call by Reference,Object as Function Argument, Array of Objects Module-4-Constructor and Destructor Constructor Types-Default, Parameterized, Copy Constructor,Destructor,Concept of Pointers Shallow Copy,Deep Copy Module-5- Exception Handling-Static members,Static functions,Exception Handling	14 Hrs

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Course Title: Capstone Project	
Course Code: 241MEMCL104	Semester: II
Teaching Scheme: L-T-P: 0-0-0	Credits: 00
Evaluation Scheme ISE: 50 Grade	ESE Marks: 00

Course Objectives:

1	To inculcate independent learning by problem solving with social context.
2	To engages students in rich and authentic learning experiences.
3	To emphasizes learning activities that are long-term, interdisciplinary and student-centric.
4	To provide every student the opportunity to get involved either individually or as a group so as to develop team skills and learn professionalism.

Curriculum Details

As per the approved structure of curriculum, students will be allowed to do capstone project during second semester of B. Tech. program.

Topics:

Capstone Project may be a theoretical analysis, modeling & simulation, experimentation & analysis, prototype design, fabrication of new equipment, correlation and analysis of data, software development, etc. or a combination of these.

Group Structure:

Working in supervisor/mentor monitored groups; the students plan, manage, and complete a task/project/activity which addresses the stated problem.

1. There should be team/group of 4 -5 students
2. A supervisor/mentor teacher assigned to individual groups

Selection of Project:

The project demo model for learning is recommended. The model begins with the identifying of a problem, often growing out of a question or "wondering". This formulated problem then stands as the starting point for learning. Students design and analyze the problem within an articulated interdisciplinary or subject frame or based on Rural/Social internship.

A problem can be theoretical, practical, social, technical, symbolic, cultural, and/or scientific and grows out of students' wondering within different disciplines and professional environments. A chosen problem has to be exemplary. The problem may involve an interdisciplinary approach in both the analysis and solving phases.

By exemplarity, a problem needs to refer back to a particular practical, scientific, social and/or technical domain. The problem should stand as one specific example or manifestation of more general learning outcomes related to knowledge and/or modes of inquiry.



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There are no commonly shared criteria for what constitutes an acceptable project. Projects vary greatly in the depth of the questions explored, the clarity of the learning goals, the content, and structure of the activity.

1. A few hands-on activities that may or may not be multidisciplinary.
2. Use of technology in meaningful ways to help them investigate, collaborate, analyze, synthesize, and present their learning.
3. Activities may include- Solving real life problem, investigation, /study and Writing reports of in-depth study, fieldwork.

Recommended Guidelines and phases:

Capstone project is learning through activity. One of the teachers can be appointed as guide for capstone project group. Following are the recommended guidelines that will work as an initiator and facilitator in process of completion of Capstone project.

1. In first week of commencement of 2nd semester, let the guide create awareness about capstone project (what, why, and how) among the students. Convey students expected outcomes, assessment process and evaluation criteria.
2. Get groups of students registered preferably 4-5 students per group.
3. Assign guide to each group.
4. Provide guidelines for title identification (Problem can be some real-life situation that needs technology solutions. This situation can be identified by rural/social internship, by meeting people around, visiting various industries, society, and institutes. The solution can be prototype, model, convertible solutions, survey and analysis, simulation, and similar).
5. Let students submit the problem identified in prescribed format (Problem Statement, Initial Survey for topic finalization, Abstract, Software, Hardware required, Title)
6. Guide can approve the problem statements based on feasibility and learning outcomes expected for first year engineering students
7. Guide is to monitor progress of the task during phases of project work. Broadly phases may include- requirements gathering, preparing a solution, technology design for the solution.
8. Weekly monitoring and continuous assessment record are to be maintained by guide.
9. Get the report submitted at the end of semester.

Student is required to prepare a capstone project and file containing documentary proofs of the activities done by him. The evaluation will be done by expert committee constituted by HoD/Departmental capstone project In-charge/ faculty mentor.

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There are no commonly shared criteria for what constitutes an acceptable project. Projects vary greatly in the depth of the questions explored, the clarity of the learning goals, the content, and structure of the activity.

1. A few hands-on activities that may or may not be multidisciplinary.
2. Use of technology in meaningful ways to help them investigate, collaborate, analyze, synthesize, and present their learning.
3. Activities may include- Solving real life problem, investigation, /study and Writing reports of in-depth study, fieldwork.

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