Annasaheb Dange College of Engineering and Technology, Ashta
An Autonomous Institute

F.Y. B. Tech.
Curriculum

MECHANICAL ENGINEERING

SEMESTER I - II
W.e.f. 2022-23

Department of Mechanical Engineering

Teaching and Evaluation Scheme

F. Y. B. Tech Semester I

Course Code	Course Name	Teaching Scheme				THEORY							PRACTICAL						GRAND TOTAL
						ISE		MSE+ ESE			Total	Min	ISE		ESE		Total	Min	
		L	T	P	Credits	Max	Min	MSE	ESE	Min			Max	Min	Max	Min			
2MEBS101	Applied Chemistry	3	-	-	3	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEBS102	Applied Mathematics-I	3	1	-	4	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEES103	Engineering Graphics	2	-	-	2	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEES104	Basic Electrical & Electronics Engineering	3	-	-	3	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEBS105	Applied Chemistry Laboratory	-	-	2	1	-	-	-	-	-	-	-	25	10	-	-	25	10	25
2MEES106	Engineering Graphics with CAD Laboratory	-	-	4	2	-	-	-	-	-	-	-	50	20	-	-	50	20	50
2MEVS107	Computer Programming Laboratory	2	-	2	2	-	-	-	-	-	-	-	50	20	50	20	100	40	100
2MEPC108	Workshop Practice-I	-	-	2	1	-	-	-	-	-	-	-	25	10	-	-	25	10	25
2MEHS109	Value added Course	-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	50
		13	1	12	19														650
	Total Contact Hours	26																	

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEBS101, Applied Chemistry**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	03/00/00
Credits	03
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: Upon successful completion of this course, the students will be able to:	
2MEBS101_1	**Apply** principles of water testing to identify water quality parameters and methods of water softening using fundamental laws.
2MEBS101_2	**Classify** fuels and analytical methods to identify their characteristics using basic principles of chemistry.
2MEBS101_3	**Select** engineering, ceramic materials on the basis of its properties and applications using their chemical composition.
2MEBS101_4	**Apply** the methods of prevention of corrosion to a given metal considering it's types and factors affecting corrosion.
2MEBS101_5	**Compute** the values of hardness of water and calorific values of fuels using fundamental equations.

Course Contents:		Hrs.
Unit 1	**Water Technology:** Introduction, impurities in natural water, Water Testing: acidity, alkalinity and chlorides, hardness of water (definition, causes and significance), Calculations of total hardness, disadvantages of hard water in domestic and industrial applications. Scales and sludges: Formation in boilers and removal, Treatment of hard water by ion-exchange process, Zeolite process, Desalination of brackish water by Reverse Osmosis.	07
Unit 2	**Chemical and Instrumental Techniques:** Chemical analysis, its types, Different ways to express concentration of solution. Numerical problems. Standards and its types. **p^H-metry:** Introduction, pH measurement using glass electrode and applications. **Spectrometry:** Introduction, Laws of spectrometry (Lamberts and Beer-Lambert's law). Instrumentation and applications of UV-Visible spectrophotometer, **Chromatography:** Introduction, Principle, instrumentation and applications of gas-liquid chromatography (GLC).	07
Unit 3	**Engineering Materials:** A) **Polymers:** Introduction, plastics, thermo-softening and thermosetting plastics, industrially important plastics like phenol-formaldehyde, urea formaldehyde. Conducting polymers, biodegradable polymers (properties and applications), composites, FRP and glass reinforced plastics (GRP). B) **Lubricants:** Introduction, classification of lubricants (solid, semisolid and liquid), lubrication and it's types, characteristics of lubricants: viscosity, viscosity index, flash point, fire point, cloud point and pour point	07

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Unit 4	**Fuels and Non-conventional Energy Sources:** **Fuels:** Introduction, classification, characteristics of good fuels, comparison between solid, liquid and gaseous fuels, types of calorific value (higher and lower), Bomb calorimeter and Boy's calorimeter. Numericals on Bomb and Boy's calorimeter. **Batteries:** Introduction, Characteristics of a battery, Rechargeable Li- ion batteries (Diagram, charging-discharging reactions, advantages and applications). **Fuel Cells:** Introduction, H_2-O_2 Fuel cell (Construction, working and applications), applications of fuel cells.	07
Unit 5	**Corrosion& Green Chemistry:** **Corrosion:** Introduction, causes, types, Atmospheric corrosion (oxidation corrosion), Electrochemical corrosion (hydrogen evolution and oxygen absorption mechanism), factors affecting rate of corrosion. Prevention of corrosion by proper design and material selection, hot dipping (galvanizing and tinning), cathodic protection method, electroplating, metal cladding. **Green Chemistry:** Definition, Twelve principles of green chemistry, Research and industrial applications.	07
Unit 6	**Metallic & Ceramic Materials:** **Alloys:** Introduction, alloy definition and classification, purposes of making alloys. Ferrous alloys: Plain carbon steels (mild, medium and high). Nonferrous alloys: Copper alloy (Brass), Nickel alloy (Nichrome), Aluminum alloy (Duralumin and Alnico). **Ceramic Materials:** Introduction, types of ceramics, types of cement & their applications, Manufacture of Portland Cement by wet process, Composition of Portland Cement & their functions- a) Chemical composition, b) Compound composition, Setting & hardening of Portland Cement.	07

Text Books:

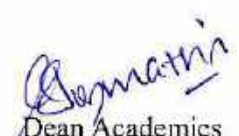| Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	A Text Book of Engineering Chemistry	S. S. Dara	S. Chand & Co. Ltd., New Delhi.	11th	2008
02	A Text book of Engineering Chemistry	ShashiChawala	DhanpatRai Publishing Co. New Delhi.	3rd	2007
03	A Test Book of Applied Chemistry	Ziyauddin D. Sande, Vijayalaxmi M. Vairat, Pratapsingh V. Gaikwad	Wiley Publications	1st	2018
04	A Textbook for Engineers and Technologists	Oleg Roussak, H. D. Gesser	Kindle Edition, Springer	2nd	2021

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Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Chemistry	Jain & Jain	DhanpatRai Publishing Co., New Delhi.	16th	2015
02	Industrial Chemistry	B. K. Sharma	Goel publication (P) Ltd.	10th	1999
03	Fundamentals of Engineering Chemistry	S. K. Singh	New Age International (P) Ltd, New Delhi.	1st	2009
04	Instrumental Methods of Chemical Analysis	Chatwal and Anand	Himalaya Publishing House, Mumbai.	5th	2005
05	Engineering Chemistry	Wiley India	Wiley India Pvt. Ltd., New Delhi.	1st	2012

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	2MEBS102, Applied Mathematics I
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	03/01/00
Credits	04
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEBS102 _1	Solve the system of linear equations by using matrix method.
2MEBS102 _2	Calculate Eigen values and Eigen vectors.
2MEBS102 _3	Compute various measures of central tendencies, dispersion and to interpret them.
2MEBS102 _4	Fit the curves for bivariate data by applying least square techniques.
2MEBS102 _5	Apply Taylor series to find the expansion of functions.
2MEBS102 _6	Compute the nth power and roots of the complex number by using De-Moivre's Theorem.

Course Contents:		Hrs.
Unit 1	**Matrices and Solution of Linear System Equations:** Rank of a matrix, Normal form of a matrix, echelon form, Consistency of linear system of equations (system of homogeneous and non- homogeneous linear equation).	07
Unit 2	**Eigen Values and Eigen Vectors:** Vectors, Linear dependence and linear independence of vectors, Eigen values, Properties of Eigen values, Eigen vectors, Properties of Eigenvectors.	06
Unit 3	**Measures of Central Tendency and Dispersion:** Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode, Partition values: Quartiles, Deciles and Percentiles, Standard Deviation and Variance.	07
Unit 4	**Curve fitting and Statistics:** Method of Least Squares, Fitting of Straight Line, Fitting of Parabola, Fitting of exponential curves, Lines of Regression.	07
Unit 5	**Expansion of Functions and Indeterminate Forms:** Taylor's series, Maclaurin's series, Standard expansions, Expansion of function using Standard series, Indeterminate forms.	07
Unit 6	**Complex Numbers:** De Moivre's theorem, Roots of a complex number, Expansion of sin(nx) and cos(nx) in powers of sinx and/or cosx, Circular functions of a complex variable, Hyperbolic functions, relation between circular and hyperbolic functions, Inverse Hyperbolic functions.	08

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A Text Book of Engineering Mathematics	N. P. Bali, Manish Goyal	Laxmi Publications(P) Ltd	8th	2011
02	Advanced Engineering Mathematics	H. K. Das	S. Chand	22nd	2018
03	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw Hill Publ.	6th	2010
04	Probability and Statistics for Engineers	PHI Learning private limited	Richard A. Johnson	8th	2014

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers	44th	2018
02	Advanced Engineering Mathematics	N. P. Bali, Manish Goyal	Infinity science press	7th	2010
03	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley Publishers	10th	2017
04	Probability and Statistics for Engineers	Dr. J. Ravichandran	Wiley	1st	2012

List of Tutorials:

Sr. No.	Title of Tutorials
01	Matrices and Solution of Linear System Equations
02	Matrices and Solution of Linear System Equations
03	Eigen Values and Eigen Vectors.
04	Measures of Central Tendency and Dispersion
05	Measures of Central Tendency and Dispersion
06	Curve fitting and Statistics
07	Curve fitting and Statistics
08	Expansion of Functions and Indeterminate Forms

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEES103, Engineering Graphics**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	02/00/00
Credits	02
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: After successful completion of this course, the student will be able to:	
2MEES103_1	**Sketch** projection of simple geometries [point, line, planes].
2MEES103_2	**Sketch** projection of solids inclined to reference plane
2MEES103_3	**Produce** the orthographic projection.
2MEES103_4	**Produce** the isometric projection.
2MEES103_5	**Prepare** sectional view of solids.

Course Contents:		Hrs.
Unit 1	**Fundamentals of Engineering Graphics and Engineering Curves** **A) Fundamentals of Engineering Graphics:** Introduction to Drawing instruments and their uses. Different types of lines used in drawing practice, Dimensioning system as per BSI (Theoretical treatment only) **B) Engineering curves:** Construction of regular Polygons up to hexagon). Ellipse, Parabola, Hyperbola, Involute, Archimedean spiral, Cycloid.	04
Unit 2	**Projection of lines:** Introduction to First angle and third angle methods of projection. Projections of points on regular and auxiliary reference planes. Projections of lines (horizontal, frontal, oblique and Profile lines) on regular and auxiliary reference planes. The true length of a line, Point View of a line, angles made by the line with reference planes. Projections of intersecting lines, Parallel lines, perpendicular lines, and skew lines. grade and bearing of a line.	04
Unit 3	**Projection of plane:** Projections on regular and on auxiliary reference planes. Types of planes (horizontal, frontal, oblique and Profile planes), Edge view and True shape of a Plane. Angles made by the plane with Principle reference planes. Projection of plane figure inclined to both the plane. (Circle and regular polygon).	04
Unit 4	**Projection of solid:** Projection of solids such as Prisms, Pyramids, Cylinder and Cones inclined to both reference plane (excluding frustum and sphere).	06
Unit 5	**Sections of solids:** Prisms, Pyramids, Cylinders and Cones, in simple positions and inclined to one reference plane and parallel to others.	04
Unit 6	**Development of plane and curved surfaces:** Prisms, Pyramids, Cylinders and Cones along with cutting planes.	04

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Drawing & Graphics	K. Venugopal	New Age Publication	5th	2012
02	Engineering Drawing	M. B. Shaha and B. C. Rana	Pearson Education	2nd	2012
03	ABC's of Auto CAD	George Omura	BPB Publication.	--	--
04	Engineering graphic with Auto CAD 2002,	Bethune	Pearson Publication	--	--

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Drawing	N D Batt & V M Panchal	Charotor Publication House, Bombay	50th	2010
02	Engineering Drawing	Dhananjay A Jhole	Tata Mc-Graw Hill	5th	2011
03	Fundamentals of Engineering Drawing	Warren. J. Luzadder	Prentice-Hall of India.	11th	1999
04	Engineering Drawing	P S Gill	Katson books	9th	2012

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEES104, Basic Electrical & Electronics Engineering**
Prerequisite/s	Simultaneous Linear Equations & Semiconductor Physics
Teaching Scheme: Lecture/Tutorial/Practical	03/00/00
Credits	03
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEES104 _1	Solve the DC circuits with independent sources using Kirchhoff's laws and Network Theorems.
2MEES104 _2	Analyze A. C. circuits with an interpretation of the relationship between voltage, current, and power.
2MEES104 _3	Explain the construction and working principle of electrical machines, and their applications.
2MEES104 _4	Discuss the working principles and characteristics of semiconductor devices
2MEES104 _5	Construct sequential logic circuits and combinational logic circuits.
2MEES104 _6	Explain the transducer to measure the physical quantities and their applications

Course Contents:		Hrs.
Unit 1	**DC Circuits:** Electrical circuit elements, KCL and KVL. Star- delta conversion, voltage, and current sources. Thevenin, Norton, and Superposition.	07
Unit 2	**AC Circuits:** Sinusoidal waveforms, peak, average, RMS values, phasor representation, real, reactive, and apparent power. Analysis of single-phase, AC circuits consisting of R, L, C, RL, RC, RLC circuits, and three-phase balanced circuits. Voltage and current relations in star and delta.	07
Unit 3	**Electrical Machines:** Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single-Phase Transformer, and Single-Phase Induction Motor. Applications of Stepper, Servo, and Universal Motors. Introduction to Fuse & Circuit breakers	07
Unit 4	**Semiconductor Devices and Applications:** Introduction - Characteristics of PN Junction Diode, Zener Effect – Zener Diode and its Characteristics – Half Wave and Full Wave Rectifiers – Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics	07
Unit 5	**Digital Electronics:** Binary Number System – Boolean Algebra theorems– Digital circuits - Introduction to sequential Circuits– Flip-Flops – Registers and Counters – A/D and D/A Conversion	07
Unit 6	**Transducers & Applications:** Transducers for Displacement, level, temperature pressure speed measurement range specifications, Applications of transducers in Digital thermometer, weighing machine, washing machine, microwave oven, and mobile handset.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Principles of Electrical Engineering and Electronics	V. K. Mehta	S. Chand & Co., Publications, New Delhi	3rd	2010
02	Basic Electrical and Electronics Engineering	D.P. Kothari	TMH, New Delhi	2nd	2014
03	Electrical Circuit Theory and Technology	John Bird	Routledge	5th	2013
04	Sensors and Transducers	D. Patranabi	PHI Learning Pvt. Ltd	2nd	2003

Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Integrated Electronics	Millman and Halkias	McGraw Hill	2nd	2010
02	Electrical Technology", Vol.–II	A.K. Thereja and B.L.Thereja,	S. Chand & Co., Publications	2nd	2007
03	Basic Electrical Engineering	U. Bakshi and A. Bakshi	Technical Publications, Pune	1st	2005
04	Electronic Principles	Albert Malvino, David Bates	McGraw Hill Education	7th	2017

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	2MEBS105, Applied Chemistry Laboratory
Prerequisite/s	--
Teaching Scheme:Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes: Upon successful completion of this course, the students will be able to:	
2MEBS105_1	Determine the hardness acidity, alkalinity, chloride content using appropriate methods of titration for given sample of water.
2MEBS105_2	Estimate rate of corrosion in acidic and alkaline medium by depreciation of weight.
2MEBS105_3	Use pH meter to determine pH value of given solution and validate the findings with suitable optical method (photo-colorimeter) and graphical methods.
2MEBS105_4	Analyze coal sample, lubricants and aqueous solutions to get the percentage compositions using appropriate methods.
2MEBS105_5	Communicate effectively about laboratory work both orally and writing.

List of Experiments:

Expt. No.	Title of the Experiment
01	Determination of acidity of water sample. (Neutralization Titration)
02	Determination of alkalinity of water sample. (Acid- Base Titration).
03	Determination of chloride content of water by Mohr's method. (Precipitation Titration).
04	Determination of total hardness of water sample by EDTA method.
05	Determination of moisture, voltile and ash content in a given coal sample. (Proximate analysis)
06	Preparation of Urea-formaldehyde resin.
07	Determination of viscosity of lubricating oil.
08	Estimation of zinc in brass solution (Displacement Titration)
09	Estimation of copper in brass solution (Displacement Titration)
10	Determination of rate of corrosion of aluminum in acidic and basic medium
11	Determination of pH of sample solution by pH meter
12	Determination of calorific value of fuel using Bomb calorimeter.
13	Demonstration of Photo-colorimeter.

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Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	A Text Book of Engineering Chemistry	S. S. Dara	S. Chand & Co. Ltd., New Delhi.	11th	2008
02	A Text book of Engineering Chemistry	ShashiChawala	DhanpatRai Publishing Co. New Delhi.	3rd	2007
03	A Test Book of Applied Chemistry	Ziyauddin D. Sande, Vijayalaxmi M. Vairat, Pratapsingh V. Gaikwad	Wiley Publications	1st	2018
04	A Textbook for Engineers and Technologists	Oleg Roussak, H. D. Gesser	Kindle Edition, Springer	2nd	2021

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Chemistry	Jain & Jain	DhanpatRai Publishing Co., New Delhi.	16th	2015
02	Industrial Chemistry	B. K. Sharma	Goel publication (P) Ltd.	10th	1999
03	Fundamentals of Engineering Chemistry	S. K. Singh	New Age International (P) Ltd, New Delhi.	1st	2009
04	Instrumental Methods of Chemical Analysis	Chatwal and Anand	Himalaya Publishing House, Mumbai.	5th	2005
05	Engineering Chemistry	Wiley India	Wiley India Pvt. Ltd., New Delhi.	1st	2012

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEES106, Engineering Graphics with CAD Laboratory**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00/00/04
Credits	02
Evaluation Scheme: ISE/ESE	50/00

Course Outcomes: After successful completion of this course, the student will be able to:	
2MEES106_1	**Prepare** drawing of Points, lines, Planes using Auto Cad.
2MEES106_2	**Plot** projection of solids.
2MEES106_3	**Produce** the orthographic projection.
2MEES106_4	**Plot** the isometric projection.
2MEES106_5	**Prepare** sectional view of solids.

Course Contents: Theory

1. Basic command to draw 2- D objects like line, point, circle, arc, ellipse, polygon, Polyline, spline etc.
2. Editing: Erase, extension, breaking, fillet, chamfer, trimming, scaling etc.
3. Viewing and other: Zoom pan, mirroring, rotating, moving objects, arrange blocks, Offset etc.
4. Hatching of sections.
5. Use of layers in drawing
6. Plotting of drawing

Course Contents: Laboratory

Sr. No.	Title
01	Computer aided drafting of Line, circle and polygon (upto Hexagon only).
02	Computer aided drafting of orthographic vies of simple 3d objects.
03	Computer aided drafting of Isometric view.
04	Plotting of sectional views of given solids or small 3D machine components.

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Drawing	N D Batt & V M Panchal	Charotor Publication House, Bombay	50th	2010
02	Engineering Drawing	Dhananjay A Jhole	Tata Mc-Graw Hill	5th	2011
03	Engineering Drawing	P S Gill	Katson books	9th	2012
04	ABC's of Auto CAD	George Omura	BPB Publication.		
05	Engineering graphic with Auto CAD 2002,	Bethune	Pearson Publication		

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Drawing & Graphics	K. Venugopal	New Age Publication	5th	2012
02	Engineering Drawing	M. B. Shaha and B. C. Rana	Pearson Education	2nd	2012

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEVS107, Computer Programming Laboratory**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	02/00/02
Credits	02
Evaluation Scheme: ISE /ESE	50/50

Course Outcomes:	Upon successful completion of this course, the student will be able to:
2MEVS107_1	**Write,** compile and debug programs in C language.
2MEVS107_2	**Make** use of different data types and operators to solve various civil Engineering problems.
2MEVS107_3	**Make** use of conditional expressions and looping statements to solve civil Engineering problems associated with conditions and repetitions.
2MEVS107_4	**Demonstrate** C Programs for various problem statements.
2MEVS107_5	**Practice** C program for various Mechanical Engineering problem statements.

Course Contents: Theory		Hrs.
Unit 1	**Computer Fundamentals with Basics of Programming** Introduction to Computer, Computer System Hardware, Input and Output Devices, The meaning of algorithms, Flowcharts, Pseudo codes, Writing algorithms and drawing flowcharts for simple exercises, Memory concepts, C Program development environment.	**05**
Unit 2	**C Fundamentals** Importance of 'C' Language, History, Structure of 'C' Program, Sample 'C' Program, Constants, variables and data types. Operators and expressions, Managing input / output operations, Control statements-Decision making, Case control & Looping Constructs.	**04**
Unit 3	**Array** Array, one dimensional and two dimensional arrays, declaration and initialization of arrays, reading , writing and manipulation of above types of arrays, multidimensional arrays. Strings-Declaring and initialing character array, reading and writing string to/from terminal, arithmetic operations on characters, putting strings together, and string handling functions.	**06**
Unit 4	**Functions** Need of user defined functions, elements of User defined functions, defining functions, return values and their types, function calls, function declaration, methods of parameter passing, Scope rule of functions, user defined and library functions.	**04**
Unit 5	**Structure & Pointers** Need of Structure, Defining a structure, declaring and accessing structure variables, structure initialization, copying and comparing structure variables, array of structures, structures and functions, Unions. Difference between	**04**

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	Structure & Union Understanding pointers, accessing the address space of a variable, declaring and initialization pointer variables, accessing a variable through its pointer, pointer expressions, pointers and arrays, pointer and character strings, pointer and structure		
Unit 6	**File Handling** Defining and opening a file, closing a file, input/output operations on files, file handling modes, error handling during I/O operations, random access files.		05

Course Contents: Laboratory

For completion of the Term Work student should have to perform following experiments:

- Write an algorithm and draw flowchart for given problem statement.
- Implement a program using different data types and operators in C.
- Implement a C program using Decision control statement.
- Implement a C program using Repetitive control statement.
- Implement a Program to demonstrate one dimensional and two dimensional Array.
- Implement a program to demonstrate String handling functions
- Implement a Program to demonstrate user-defined function in C.
- Implement a Program to demonstrate recursion in C(factorial, Fibonacci).
- Implement a program to demonstrate pointer and pointer arithmetic in C.
- Implement program to demonstrate structure and union in C
- Implement a program to demonstrate file handling in C.

Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Programming And Problem Solving Using C Language	ISRD Group	McGraw-Hill Publications	2nd	2012
02	Let Us C	Yashwant Kanetkar	BPB	3rd	2011
03	C How to Program	Harvey M. Deitel, Paul J. Deitel, Abbey Deitel	Pearson	2nd	2009
04	Programming in ANSI C	E. Balguruswamy	Tata Mc-Graw Hill	4th	2008

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Reference Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	C: The Complete Reference	Herb Schildt	McGraw Hill Education	4th	2018
02	Modern C for Absolute Beginners: A Friendly Introduction to the C Programming Language	Slobodan Dmitrović	Apress	1st	2021
03	Introduction to C programming	Oxford University Press	Oxford University Press	2nd	2014
04	Introduction to computers and C programming.	S.K. Bajpai	Newagepublishers	1st	2002

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEPC108, Workshop Practice - I**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes : Upon successful completion of this course, the student will be able to:

2MEPC108_1	Identify basic engineering practices and safety measures.
2MEPC108_2	**Select** appropriate measuring instruments and tools used in fitting, sheet metal and pipe fitting operations
2MEPC108_3	**Create** a male-female joint by carrying out different fitting operations.
2MEPC108_4	**Produce** a component using different sheet metal operations and tools.
2MEPC108_5	**Work** effectively in team to accomplish the assigned task.

Course Content:

1. Introduction to industrial safety, fire hazards, causes of accidents, safety precautions while working in shop, safety equipments and their uses.
2. Assignment on industrial safety.
3. Brief introduction to measuring instruments like – Steel rule, Calipers, Vernier Caliper, Micrometer, Vernier height Gauge etc. Least counts, common errors and care while using them, Use of marking gauge, 'V' block and surface plate.
4. Assignment on measuring instruments and their applications.
5. Dismantling, inspection and assembly of different products (e.g. three jaw chuck, hydraulic jack, screw jack, engine sub assembly etc.) using different tools and measuring instruments.
6. Study of various tools like- files, drills, taps, dies, fitting operations.
7. Assignment on different fitting tools and operations, types of files, tap, dies, drills.
8. Demonstration of die threading processes, pipe fittings with different joints (G.I. and PVC)
9. One job Male/Female fitting with operations- Marking, cutting, drilling, tapping, filling, etc. (One job per student)
10. Introduction to sheet metal work, specifications of metal sheet, working tools, sheet metal working operations like- cutting, bending, punching, riveting, joining by brazing and soldering.
11. Assignment on sheet metal work, tools and their operations.
12. One job like dust pan, tray, box, dust bin, book stopper in a group of 3 to 4 students.

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Workshop Technology - I & II	SK Hajara Choudhury, AK Hajara Choudhury, Nirjhar Roy	MMP Pvt. Ltd.	14th	2003
02	Workshop Technology	Gupta and Kaushik,	New Heights	5th	2011
03	Workshop Practice	R. K. Rajput	Laxmi Publicatios Pvt. Ltd.	2nd	2008
04	Workshop Technology	Khurmi and Gupta	S. Chand Publications	1st	2006

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Workshop Technology, Vol-I	B.S.Raghuvanshi	DhanpatRai and Sons	9th	2007
02	Workshop Practice	H.S.Bawa	TMH Publications, New Delhi	2nd	2012
03	Production Technology	P. C. Sharma	S. Chand Publications	11th	2011
04	Workshop Practice	Surendra D Ghatol Smith M Solanki	Nirali Prakashan	1st	2017

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEHS109_A, Badminton**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_A1	**Improve** physical fitness.
2MEHS109_A2	**Understand** the basic rules and how they can play the game of badminton.
2MEHS109_A3	**Provide** opportunities for playing modified games to promote student learning
2MEHS109_A4	**Develop** students' critical thinking skills, problem solving skills, self-management skills, collaboration skills, risk assessment etc.
2MEHS109_A5	**Learn** various technical motor skills in badminton and how you can move better in the court.
2MEHS109_A6	**Acquiring** a satisfactory level of knowledge and experience of the sport, to enable students to play by themselves for recreation.

Course Contents:		Hrs.
Unit 1	Introduction to badminton – Aim – Objectives – Short reference in Badminton history Understand the basic rules and how they should play normal game.	04
Unit 2	Skills - Service, Net shot, Clear, Drop, Smash. Skills - Service Forehand & Backhand, Net shot, Drive (Presentation and practice to the court)	06
Unit 3	Skills – Clear, Drop, Smash Implementation of singles rules	05
Unit 4	Footwork 1 Footwork 2	05
Unit 5	Implementation of doubles rules. Forehand strokes. Motor skills practice 1	06
Unit 6	Motor skills practice 2 Motor skills practice 3 Motor skills practice 4	04

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEHS109_B,Volley Ball**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_B1	To send the ball over the net, according to the regulations, to the ground on the opponents ground
2MEHS109_B2	The ball is put into play through the service right back player within the service zone
2MEHS109_B3	The Ball must hit with one hand or one arm and directly send over the net opponent's court.
2MEHS109_B4	To valley the ball over the net before it touches on the ground
2MEHS109_B5	The players use their hands to volley the ball.

Course Contents:		Hrs.
Unit 1	Introduction & Understand basic volleyball rules, terminology, and scoring procedures.	04
Unit 2	Demonstrate basic skills associated with volleyball, including passing, setting, serving, attacking (spiking), and blocking.	06
Unit 3	Demonstrate the ability to perform individual offensive and defensive skills and strategies.	05
Unit 4	Demonstrate an understanding of the typical game sequencing: serve, pass, attack, defense, transition, and defense.	05
Unit 5	Understand and apply the knowledge of basic rules of volley ball. Skill Practice	06
Unit 6	Demonstrate proper etiquette and good sportsmanship. And Skill related Practice. Skill Practice	04

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nDCET

Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEHS109_C, Kabaddi**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_C1	**Acquire,** analyze and interpret basic skills
2MEHS109_C2	**Appraise** the rules and regulation.
2MEHS109_C3	**Demonstrate** and assess various basic skills/techniques and game strategies.
2MEHS109_C4	**Develops** confidence, concentration and tolerance in players.
2MEHS109_C5	**This** game also Provides an opportunity for healthy competitions among equal players and help them make friends.

Course Contents:		Hrs.
Unit 1	Introduction to Kabaddi – Aim – Objectives – Short reference in Kabaddi history Understand the basic rules and how they should play normal game.	04
Unit 2	Demonstrate basic skills associated with Kabaddi, including pushing, Bonus, Tackling, attacking, and blocking	06
Unit 3	Demonstrate an understanding of the typical game sequencing: service, Bonus, attack, defense, Raiding and defense.	05
Unit 4	Demonstrate the ability to perform individual offensive and defensive skills and strategies. Stepping Practice.	05
Unit 5	Skill Demo – Stepping, Bonus, Foot touch, Toe touch, Thrust, Squat leg, Kicks & Practice.	06
Unit 6	Skill Practice And Shadow Practice	04

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	**2MEHS109_D, Foot Ball**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_D1	By applying these principles through active participation, students develop the necessary Skills and knowledge to play football.
2MEHS109_D2	**Provides** students with opportunities to improve physical fitness acquire knowledge of fitness concepts and practice positive personal and social skills.
2MEHS109_D3	**Students** will gain an understanding of how a wellness lifestyle affects one's health, fitness and physical performance

Course Contents:		Hrs.
Unit 1	Introduction to Football – Aim – Objectives – Short reference in Football history Understand the basic rules and how they should play normal game.	04
Unit 2	Introduce students to the basic skills and knowledge associated with football. Understand basic football rules, terminology, and safety concerns.	06
Unit 3	Demonstrate the basic football skills of passing, three point stance, catching, blocking, hand-offs, punting, the carry and kicking & Practice.	05
Unit 4	Demonstrate the ability to perform individual offensive and defensive skills and strategies.	05
Unit 5	Improve personal fitness through participation in yoga, muscular strength, muscular endurance, and flexibility activities & Practice.	06
Unit 6	Successfully participates in skill improvement and offensive game strategies & Practice	04

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	2MEHS109_E, Bharatnatyam Classical Dance
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:

2MEHS109_E1	Interpolation of Indian classical dance forms & basic types of Bharatnatyam.
2MEHS109_E2	Subdivide bharatnatyam in terms of Nrutt, Nrutya & Nattya.
2MEHS109_E3	Show the perform base on signal & combine hand posture in terms of Ganesh Vandana & Mahalaxmi Ashtak

Course Contents:		Hrs.
Unit 1	History of Bharatnatyam Dance style & information about all Indian classical dance forms.	01
Unit 2	Basic types of Bharatnatyam: - Tatty Advu, Natty advu, Vishruadvu, Kuddit Mettadvu, Mettadvu, tattikudditmettadvu & Tirmanam (small). Study of Navras Abhinay. Single Hand posture, Footwork, Shirobhed (head movement),	10
Unit 3	Combine Hand posture. Meaning of Guruvandna, Ganesh, mahalaxmi shlok. Definition of Nrutt, Nrutya & Nattya.	06
Unit 4	Practical session of Ganeshvandna Shlok in classical music.	06
Unit 5	Practice Sessions. & Presentation of Ganesh vandna	07
Unit 6	History of Bharatnatyam Dance style & information about all Indian classical dance forms.	01

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	2MEHS109_F, Harmonium Classical Music
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_F1	**Outline** in History Harmonium & different Ragas.
2MEHS109_F2	**Perform** on different songs
2MEHS109_F3	**Role** plays the different music by means of harmonium.

Course Contents:		Hrs.
Unit 1	History & Introduction of Harmonium.	02
Unit 2	Harmonium presentation of Raag:-Bhoopraag / Bhimpalash raag.	12
Unit 3	Practice sessions.	03
Unit 4	Practice song notations & Harmonium Dhoon (percussion)	08
Unit 5	Practice sessions & students presentations	05
Unit 6	History & Introduction of Harmonium.	02

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	2MEHS109_G, Indian Folk Dance
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_G1	Discuss different types in Indian Folk dance.
2MEHS109_G2	Demonstrate Navras Abhinay, Tribal dance, Dhangari & Lavni dance.
2MEHS109_G3	Compose dance on different folk dance style.

Course Contents:		Hrs.
Unit 1	Introduction to Indian Folk dance & its forms.	02
Unit 2	Basic steps of folk dance styles.	03
Unit 3	Importance of expressions (Acting) in dance, Navras Abhinay & its types. (9 type of navras)	03
Unit 4	Tribal dance, & its different styles.	06
Unit 5	Practice sessions.	04
Unit 6	History of Dhangari & Lavni dance. Types of dhangari & lavni dance.	01
Unit 7	Steps (dance composition) of Dhangari & Lavni dance.	07
Unit 8	Practice sessions & Students performance	04

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Course Details:

Class	F.Y. B.Tech: Semester-I
Course Code and Course Title	2MEHS109_H, Karaoke Singing.
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS109_H1	**Understand** notation of the songs.
2MEHS109_H2	**Perform** happy, sad, love deviational, patriotic songs.
2MEHS109_H3	**Compose** songs in many variations.

Course Contents:		**Hrs.**
Unit 1	Song Notation	04
Unit 2	Happy song / Sad song (classical & semi classical)	08
Unit 3	Love song / Deviational song / Patriotic songs	08
Unit 4	Song composition	05
Unit 5	Practice session & students presentation	05

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(An Autonomous Institute)
Department of Mechanical Engineering

Teaching and Evaluation Scheme
F. Y. B. Tech Semester II

Course Code	Course Name	Teaching Scheme				THEORY							PRACTICAL						GRAND TOTAL
						ISE		MSE+ ESE			Total	Min	ISE		ESE		Total	Min	
		L	T	P	Credits	Max	Min	MSE	ESE	Min			Max	Min	Max	Min			
2MEBS110	Applied Physics	3	-	-	3	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEBS111	Applied Mathematics-II	3	1	-	4	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEES112	Applied Mechanics	3	1	-	4	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEVS113	Computer Programming Using C++	2	-	-	2	40	16	30	30	24	100	40	-	-	-	-	-	-	100
2MEHS114	Professional Communication Skill Laboratory	-	-	4	2	-	-	-	-	-	-	-	50	20	-	-	50	20	50
2MEBS115	Applied Physics Laboratory	-	-	2	1	-	-	-	-	-	-	-	25	10	-	-	25	10	25
2MEVS116	Computer Programming Using C++ Laboratory	-	-	2	1	-	-	-	-	-	-	-	25	10	25	10	50	20	50
2MEPC117	Workshop Practice-II	-	-	2	1	-	-	-	-	-	-	-	25	10	-	-	25	10	25
2MEES118	Design Thinking Laboratory	1	-	2	2	-	-	-	-	-	-	-	50	20	-	-	50	20	50
2MEHS119	Value added Course	-	-	2	1	-	-	-	-	-	-	-	50	20	-	-	50	20	50
		12	2	14	21														650
	Total Contact Hours	28																	

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	**2MEBS110, Applied Physics**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	03/00/00
Credits	03
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes : Upon successful completion of this course, the student will be able to :	
2MEBS110_1	**Apply** suitable optical theory to determine wavelength and divergence of monochromatic and polychromatic sources of light using relevant optical methods of testing.
2MEBS110_2	**Calculate** the interplaner spacing, lattice constant and properties of unit cell for a given crystal system based on the crystallographic study using laws of material science.
2MEBS110_3	**Use** concept of Nanotechnology to express Production technique and tools of nano material using different synthesis methods and microscopes.
2MEBS110_4	**Solve** engineering problems based on Architectural acoustics and Ultrasonic's using appropriate theories and formulae.
2MEBS110_5	**Apply** principles of Quantum mechanics to analyze observables on known wave functions using fundamental quantum mechanical processes in nature.

Course Contents:		Hrs.
Unit 1	**Wave Optics :** **Diffraction:-**Introduction, construction of plane diffraction grating, Diffraction at multiple slits, Determination of wavelength of particular colour using plane diffraction grating, Resolving power of grating, Numericals. **Polarization:-**Polarization of light, Polarization by double refraction, Positive and Negative crystals, Optical activity, Laurent's half shade Polarimeter, Numericals.	07
Unit 2	**Laser and Fiber Optics :** **Laser:** Introduction to laser, Laser and ordinary light, Interaction of radiation with matter- Absorption, Spontaneous emission, Stimulated emission, Pumping(Three level and four level), Population inversion, Metastable state, Laser beam Characteristics, Solid State laser (Ruby Laser), Industrial and medical applications of laser, Holography- Difference between ordinary photography and Holography, Construction and reconstruction of Hologram. **Optical fiber:** Introduction, Basic principle (total internal reflection), Structure of optical fiber, Propagation of light through optical fiber, Acceptance angle and acceptance cone (no derivation), Fractional refractive index change, Numerical aperture (no derivation), Classification of optical fiber, Advantages and disadvantages of optical fiber, Applications of optical fibers, Numericals.	07

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Unit 3	**Structure of Solids and its Characterization:** Crystalline state, Lattice, Space lattice, Basis and crystal structure, Unit cell, lattice parameters, Crystal system in brief,(Cubic, Monoclinic...Triclinic), Fourteen Bravais lattices, Properties of unit cell (number of atoms per unit cell, coordination number, atomic radius, packing fraction), Calculation of lattice constant(Relation between lattice constant and density), Symmetry elements in cubic crystal, Miller indices:- Procedure, Features and Sketches for different planes. **X-ray diffraction** (Laue method), Bragg's law, Bragg's X-ray diffractometer, Numericals.	08
Unit 4	**Nano Physics:** Introduction, Concept of nanotechnology, Production techniques:- Top-down (eg. Ball milling) and Bottom-up (eg. Sol-gel process), Tools – Scanning Electron Microscope (SEM) and Atomic Force Microscope (AFM), Applications of nano- materials, Carbon Nano Tube (CNT):- Structure, two types, properties and applications.	06
Unit 5	**Architectural acoustics and Ultrasonic :** **Architectural Acoustics:** Introduction, Basic requirements for acoustically good hall, Reverberation, Time of Reverberation, Sabine's formula (no derivation), Absorption coefficient, Factors affecting the architectural acoustics and their remedy, , Numericals. **Ultrasonic waves:** Introduction, Properties of ultrasonic waves, Production of ultrasonic waves by magneto striction method, Determination of wavelength and velocity of ultrasonic waves by using acoustic diffraction method, Detection of ultrasonic waves, Applications of ultrasonic waves, Numericals. **Microwaves-** Properties, Advantages, Disadvantages and its applications.	08
Unit 6	**Quantum Physics:** Introduction to Quantum mechanics, Plank's Quantum Theory, Photoelectric Effect, Compton Effect with theory, Wave Particles Duality, Matter waves, Properties of Matter wave, Heisenberg Uncertainty principle for position and momentum of particle, Problems.	06

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Physics	G Vijayakumari	Vikas Pub. House (P) Ltd	3rd	2009
02	A Text Book of Engineering Physics	M.N.Avadhanulu& P. G. Kshirsagar	S. Chand Publication.	12th	2006
03	Engineering Physics	P. K. Palanisamy	Sci Tech pub. (P) Ltd.	2nd	2009
04	Introduction to Nano science and Nanotechnology:	K.K. Chattopadhyay and A.N. Banerjee,	PHI Learning	3rd	2009

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Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Physics	ResnickHalliday, Krane,	John Wiley & Sons Pub.	8th	2008
02	Engineering Physics	R. K. Gaur & Gupta S. L	Dhanapat Rai Publication	8th	2008
03	Solid State Physics:	S. O. Pillai	New Age International Ltd.	6th	2007
04	Introduction to Solid State Physics	Charles Kittle,	Wiley India Pvt. Ltd	7th	2008
05	Materials Science and Engineering –	V. Raghvan,	PHI Learning.	5th	2006

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEBS111, Applied Mathematics-II
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	03/01/00
Credits	04
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: Upon successful completion of this course, the student will be able to:

2MEBS111_1	Solve problems on partial derivatives by using fundamental concepts of derivative and apply it to find Jacobian, Maxima and Minima of functions of
2MEBS111_2	Solve Ordinary Differential Equation by using analytical method and numerical techniques.
2MEBS111_3	Apply the concept of Special Functions to evaluate improper integrals.
2MEBS111_4	Evaluate proper and improper type of multiple integrals by using fundamental concepts of integration and apply it to find Area and Mass of a given region.
2MEBS111_5	Solve problems in probability theory using distributions.

Course content		Hrs.
Unit 1	**Partial Differentiation and Its Applications:** Function of two or more variables, Partial derivatives, Euler's theorem, Change of variables, Jacobin, Maxima and minima of functions of two variables.	08
Unit 2	**Ordinary Differential Equation (First order and First degree):** Linear differential equation, Equation reducible to linear differential equation, Exact differential equation, Equation reducible to exact equation, Simple electrical circuits.	07
Unit 3	**Numerical Solution of Ordinary Differential Equation (First order and First degree):** Picard's method, Taylor's series method, Euler's method, modified Euler's method, Runge-Kutta method.	06
Unit 4	**Finite Differences and Interpolation:** Finite differences, Newton's Interpolation formulae, central difference interpolation formulae (stirling formula), interpolation with unequal interval (Lagrange's formula)	06
Unit 5	**Special Functions:** Gamma function, Properties of Gamma function, Beta function, Properties of Beta function, Relation between Beta and Gamma functions.	08
Unit 6	**Multiple Integral and Its Applications:** Double Integrals, Triple integral, Change of Order of Integration, Change to polar, Applications to Area and Mass of plane lamina.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Higher Engineering Mathematics	Dr. B. S. Grewal	KhannaPublishers	44th	2018
02	Advanced Engineering Mathematics	N. P. Bali, Manish Goyal	Infinity science press	7th	2010
03	Probability and Statistics for Engineers	Dr. J. Ravichandran	Wiley	1st	2012
04	Numerical Methods in Engineering & Science	Dr. B. S Grewal	KhannaPublishers	9th	2010

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	A textbook of Applied Mathematics	P. N. Wartikar & J. N. Wartikar	Pune VidyarthiGrihaPrakashan	1st	2008
02	Higher Engineering Mathematics	B. V. Ramana	Tata McGraw Hill Publ.	6th	2010
03	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley Publishers	10th	2017
04	Numerical Methods	Dr. P. Kandasamy, Dr. K.Thilagavathy, Dr. K. Gunavathi	S. Chand	1st	2010

List of Tutorial:

Sr. No.	Title of Tutorials
01	Partial Differentiation and Its Applications
02	Partial Differentiation and Its Applications
03	Ordinary Differential Equation
04	Ordinary Differential Equation
05	Numerical Solution of Ordinary Differential Equation
06	Special functions
07	Special functions
08	Multiple Integrals

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEES112, Applied Mechanics
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	03/01/00
Credits	04
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: Upon successful completion of this course, the student will be able to:

2MEES112_1	Interpret the resultant force for a force system based on concepts of resolution and composition.
2MEES112_2	Sketch shear force and bending moment diagram for a beam under different loading conditions.
2MEES112_3	Calculate the forces in members of roof truss under point load by using analytical methods.
2MEES112_4	Compute moment of inertia for a composite plane lamina by using parallel and perpendicular axis theorem.
2MEES112_5	Apply the concept of dynamic equilibrium to analyze rigid bodies by using equations of motion.

Course Contents:		Hrs.
Unit 1	**Introduction to Engineering mechanics:** Basic concept - Particle, rigid body, force system, types of force system, law of transmissibility of force, resolution of a force, composition of forces, resultant force, moment of force, Varignon's theorem.	07
Unit 2	**Beam in Equilibrium:** Concept of Equilibrium- equations of equilibrium of coplanar force system Beam: Types of beam, types of support for beam, types of load acting on beam, reactions at support, shear force, bending moment, relation between load, shear force and bending moment, shear force and bending moment diagram for statistically determinate beam (simply supported, cantilever, overhanging beam) subjected to different loading conditions.	08
Unit 3	**Analysis of Truss :** Introduction of roof truss, Types of Trusses, Determinacy of a Truss, Assumptions for analysis of truss, Analysis of truss using method of Joint and method of Section.	06
Unit 4	**Centroid and Moment of Inertia :** Introduction to centroid and center of gravity, centroid of plain lamina, moment of inertia of standard shapes from first principle, parallel and perpendicular axis theorem, Moment of inertia of composite section, radius of gyration.	07

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Unit 5	**Kinematics of linear and circular motion :** Introduction to dynamics, kinematics of linear motion, Newton's 2nd law of motion, motion under gravity, motion under variable acceleration, kinematics of circular motion, super elevation, angle of banking.	07
Unit 6	**Kinetics of linear and circular motion:** Kinetics of linear motion, D'Alembert's principle and its applications in plane motion and connected bodies, work - energy principle, work done by spring, impulse – momentum principle, friction force, torque, Newton's law for rotary motion, power.	07

Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics	S. Ramamrutham	Dhanpat Rai Publishing Company (P). Ltd	9th	2010
02	Engineering Mechanics	R.S. Khurmi	S. Chand	3rd	2006
03	Engineering Mechanics	R. K. Bansal and Sanjay Bansal	Laxmi Publications Pvt. Ltd.	6th	2013
04	Engineering Mechanics	S. B. Junnarkar	Charotar Publications	16th	2011
05	Engineering Mechanics	S.S. Bhavikatti	New Age International Pvt. Ltd.	4th	2012
06	Strength of Materials	R. K. Bansal	Laxmi Publications	6th	2011

Reference Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Mechanics	Irving H. Shames	Prentice Hall of India, New Delhi	5th	2011
02	Vector Mechanics for Engineers Vol.-I and II	F. P. Beer and E. R. Johnson	Tata McGraw Hill Education	6th	2011
03	Strength of Materials	B. K. Sarkar	McGraw Hill Pub.	2nd	2007
04	Engineering Mechanics: Statics & Dynamics	Ferdinand Singer	Harper and Row Publications	9th	2009

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	**2MEVS113, Computer Programming Using C++**
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	02/00/00
Credits	02
Evaluation Scheme: ISE/MSE/ESE	40/30/30

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEVS113_1	**Explain** object-oriented programming concept.
2MEVS113_2	**Illustrate** the concept of class and object in programs.
2MEVS113_3	**Explain** concept of Inheritance for reusability.
2MEVS113_4	**Define** concept of overloading and polymorphism for solving the task in C++.
2MEVS113_5	**Apply** their knowledge and programming skills to solve various graphical and mechanical problems.

Course Contents:		Hrs.
Unit 1	**Introduction to Object Oriented Programming** Introduction to object-oriented structure, Basic concepts of object oriented language, Difference between structured and Object oriented language, Benefits and applications of Object oriented programming.	04
Unit 2	**Classes and Objects** Introduction of class, Declaration of class, Defining object of class, Data members and member functions, Accessing members of class, Friend function, friend Class.	04
Unit 3	**Inheritance** Single Inheritance, multilevel Inheritance, multiple Inheritance, hybrid Inheritance, hierarchical Inheritance.	04
Unit 4	**Overloading and Polymorphism** Concept of overloading: Operator overloading, function overloading, Virtual functions, Pure virtual function, Virtual base classes, Abstract classes, Early vs. Late binding.	05
Unit 5	**File and Streams:** Overview of C++ Stream classes, File handling modes, Read File using stream classes, Write into file using stream classes.	04
Unit 6	**Programming on Computer graphics and Mechanical applications** Introduction to computer graphics, Draw line, circle, triangle, rectangle, 2D transformation and 3D transformation, programming on Newton Rapson Method, RungeKutta Method, Euler's Method.	07

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Object-Oriented Programming with C++	E. Balagurusamy	Tata McGraw Hill	5th	2011
02	Let us C++	Yashwant Kanitkar	BPB Publication	2nd	2010
03	Computer Graphics	Hearn and Baker	Dorling Kindersley pvt. Ltd.	2nd	1997
04	Object-Oriented Programming in C++	Rajesh K. Shukla	Wiley India Pvt. Ltd.	1st	2008

Reference Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Object oriented programming in C++	Robert Lafore	Pearson Education	4th	2008
02	Programming with C++	D. Ravichandran	Tata McGraw Hill	2nd	2008
03	The C++ programming Language	BjarneStroustrup	Pearson Education	3rd	2008
04	The Complete Reference: C++	Herbert Schildt	Tata McGraw Hill	4th	2008
05	Professional C++	Marc Gregoire	Wiley India Pvt. Ltd.	3rd	2015

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Course Details:

Class	F.Y. B.Tech- Semester-II
Course Code and Course Title	**2MEHS114, Professional Communication Skill Laboratory**
Prerequisite/s	12th Standard English Grammar
Teaching Scheme: Lecture/Practical	00/00/04
Credits	02
Evaluation Scheme: ISE/ESE	50/00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS114_1	**Exhibit** the skill of sentence construction considering the frame of English language rules accurately for effective and sound communication.
2MEHS114_2	**Present** their portfolio confidently considering SWOT analysis by using digital tools convincingly as per the corporate expectations.
2MEHS114_3	**Write** formal letters proficiently by following required techniques that helps in maintaining professional affairs at workplace.
2MEHS114_4	**Produce** professional presentations proficiently on assigned topics in convincing manner using necessary tools and techniques.
2MEHS114_5	**Justify** own role in communicative events with balanced zeal, in well-organized manner.

Course Contents:

01 Checking My English Communication
02 Self - Introduction
03 Presenting my Career Choices
04 Preparing my Portfolio
05 Understanding Sentence Pattern
06 Avoiding Common Errors
07 Presenting My Portfolio
08 Note Making
09 Getting Smart with Technical Description of charts/ Images/ Processes
10 Delivering Professional Presentation
11 Application and Resume Writing
12 Email Writing
13 GD (General)
14 Introducing Guest/ Friend
15 Extempore
16 GD (Technical)
17 Mock Interview
18 Organizing Event

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Textbook

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	The Professional: Defining the New Standard of Excellence at Work	Subroto Bagchi	Penguin Books India Pvt. Ltd.	1st	2011
02	Cambridge Guide to IELTS	Pauline Cullen, Amanda French	Cambridge University Press	2nd	2017
03	A Practical Course in Effective English Speaking Skills	J. K. Gangal	PHI Learning Private Limited, New Delhi	5th	2012
04	Personality Development and Soft Skills	Barun K. Mitra	Oxford University Press, New Delhi, India	7th	2012

Reference Books

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	High-school English Grammar and Composition	Wren and Martin	S. Chand and Co., New Delhi	1st	2015
02	The Ace of Soft Skills	AjaiChowdary, BalaBalchandran	Pearson Publication, Delhi	8th	2013
03	Effective Technical Communication	M. Ashraf Rizvi	McGraw Hill Education, Chennai	2nd	2017
04	Business Communication	HorySankarMukerjee	Oxford University Press, New Delhi, India	2nd	2013

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Course Details

Class	F.Y. B.Tech- Semester-II
Course Code and Course Title	2MEBS115, Applied Physics Laboratory
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes : Upon successful completion of this course, the student will be able to:

2MEBS115_1	**Build** an experimental set up to Calculate wavelength and angular Divergence of different sources of light accurately using appropriate optical methods in organized manner.
2MEBS115_2	**Calculate** band gap energy and Specific rotation for a given semiconductor and sugar solution using appropriate theories and formulae.
2MEBS115_3	**Demonstrate** Symmetries, planes and properties of unit cell for a given crystal system based on the crystallographic study using laws of material science.
2MEBS115_4	**Communicate** effectively about laboratory work both orally and writing.
2MEBS115_5	**Practice** professional and ethical behavior to carry forward in their life.

Course Contents:

Expt. No.	Title of the Experiment
01	Plane Diffraction Grating
02	Resolving power of Grating
03	Resolving power of telescope
04	Laurent's Half Shade Polarimeter
05	Kund's tube for determination of velocity of sound
06	Divergence of The LASER Beam
07	Wavelength of LASER
08	Inverse Square Law
09	Band Gap energy
10	Seven Crystal System
11	Symmetry Element of Cube
12	Numerical aperture of optical fibre
13	Double Refraction
14	Material Characterization using ultrasound.

Minimum **EIGHT** experiments should be perform from the above list.

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Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Engineering Physics	G Vijayakumari	Vikas Pub. House (P) Ltd	3rd	2009
02	A Text Book of Engineering Physics	M.N. Avadhanulu & P. G. Kshirsagar	S. Chand Publication.	12th	2006
03	Engineering Physics	P. K. Palanisamy	Sci Tech pub. (P) Ltd.	2nd	2009
04	Introduction to Nano science and Nanotechnology:	K. K. Chattopadhyay and A.N. Banerjee,	PHI Learning	3rd	2009

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Fundamentals of Physics	Resnick Halliday and Walker	John Wiley & Sons Pub.	9th	2011
02	Concepts of Modern Physics	A Besir	McGraw Hill International	5th	2003
03	Solid State Physics:	S. O. Pillai	New Age International Ltd.	6th	2007
04	Introduction to Solid State Physics	Charles Kittle,	Wiley India Pvt. Ltd	7th	2008
05	Optics	Ajoy Ghatak	Tata McGraw Hill	5th	2012
06	Engineering Physics:	D.K. Bhattacharya and A. Bhaskaran,	Oxford University Press	6th	2010

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Course Details:

Class	F.Y. B. Tech, Semester - II
Course Code and Course Title	**2MEVS116, Computer Programming Using C++ Laboratory**
Prerequisite/s	0MEES105, 0MEES153
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ESE	25/25

Course Outcomes (COs):Upon successful completion of this course, the student will be able to:	
2MEVS116_1	**Explain** the basic concept of object-oriented programming.
2MEVS116_2	**Apply** the concepts of class, object, inheritance, overloading, polymorphism and transformation in C++.
2MEVS116_3	**Develop** programming skills to solve problems using object-oriented concept in Turbo C++.
2MEVS116_4	**Communicate** effectively, both orally and in writing journals and complete assigned tasks in team.
2MEVS116_5	**Follow** given instructions during practical performance.
2MEVS116_6	**Engage** in independent and life-long learning in the programming domain.

Course Contents:

For completion of the Term Work student should have to perform following experiments:

- Simple programs on C++, Creation of source files, Compile and Linking.
- Programs on implementation of class object and structure.
- Program on constructor and destructor.
- Program on friend function.
- Program on friend class
- Programs on single inheritance, multilevel inheritance and multiple inheritance.
- Programs on Hierarchical Inheritance & Hybrid Inheritance.
- Programs on function overloading and operator overloading.
- Programs on Virtual Function and Virtual Class concept.
- Program for File Handling. (Read Write Operations)
- Simple programs to draw line, circle, triangle etc.
- Programs on 2D, 3D transformation like scaling, translation, rotation.
- Programs on solving mechanical problems 1(Newton Raphson Method).
- Programs on solving mechanical problems 2(RungeKutta and Euler's Method).

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Course Details:

Class	F.Y. B.Tech- Semester-II
Course Code and Course Title	**2MEPC117, Workshop Practice-II**
Prerequisite/s	2MEES254
Teaching Scheme: Lecture/Tutorial/Practical	00/00/02
Credits	01
Evaluation Scheme: ISE/ESE	25/00

Course Outcomes : Upon successful completion of this course, the student will be able to:	
2MEPC117_1	**Identify** basic engineering practices and safety measures.
2MEPC117_2	**Select** appropriate measuring instruments and tools used in welding, carpentry and smithy.
2MEPC117_3	**Prepare** different jobs using electric arc welding and smithy.
2MEPC117_4	**Produce** a wooden job using different carpentry operations and tools.
2MEPC117_5	**Work** effectively in team to accomplish the assigned task.

Course Content:

1. Introduction to types of welding, gas welding, electric arc welding, resistance welding, welding equipment's, welding of various metals, electrodes classification and coding, welding joints.

2. Assignment on types of welding, types of joints.

3. Hands on practice on TIG/MIG welding for different materials.

4. One job on arc welding – Lap, butt, L joint (For individual student) or table, shoe stand, bag stand (In a group of 4 to 6 students)

5. Introduction to carpentry – classification of wood, carpentry tools – marking tools, cutting tools, striking tools, carpentry operations – marking, sawing, chiseling, grooving, etc, carpentry joints.

6. Assignment on carpentry tools, carpentry operations and joints.

7. One composite job involving dovetail joint, T joint, cross halving joint, pen stand etc. (For individual student) or Table, Teapot, stool etc. (In a group of 4 to 6 students).

8. Introduction to smithy operations like bending, forming, upsetting, drawing, smithy tools – hammer, hot and cold chisel flatter, tongs, anvil, etc.

9. Assignment on smithy tools and operations.

10. One job in smithy involving upsetting, drawing, bending such as – hooks, square headed bolt etc.

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Text Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Workshop Technology-I & II	S.K Hajara Choudhury, A.K Hajara Choudhury, Nirjhar Roy	MMP Pvt. Ltd.	14th	2003
02	Workshop Technology	Gupta and Kaushik,	New Heights	1st	2005
03	Workshop Practice	R. K. Rajput	LaxmiPublicatios Pvt. Ltd.	2nd	2008
04	Workshop Technology	Khurmi and Gupta	S. Chand Publications	1st	2006

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Workshop Technology, Vol-I	B. S. Raghuvanshi	DhanpatRai and Sons	9th	2007
02	Workshop Practice	H.S. Bawa	TMH Publications, New Delhi	2nd	2012
03	Production Technology	P. C. Sharma	S. Chand Publications	11th	2011
04	Workshop Technology, Part -1	W A J Chapman	CBS	5th	2016

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Course Details

Class	F.Y. B.Tech- Semester-II
Course Code and Course Title	2MEES118, Design Thinking Laboratory
Prerequisite/s	--
Teaching Scheme: Theory/Tutorial/Practical	01/00/02
Credits	02
Evaluation Scheme: ISE/ESE	50

Course Outcomes: After successful completion of this course the students will be able to	
2MEES118_1	Apply the design thinking techniques to empathize the customer through arranging survey and/or interviews.
2MEES118_2	Identify and formulate the solution for real world problem using design thinking technique.
2MEES118_3	Create a Prototype for defined problem using design thinking approach.
2MEES118_4	Test developed prototype to meet user's requirements through customer feedback or prototype exhibitions.
2MEES118_5	Adapt ethical practices and professional skills to provide a reliable solution for defined real world problem through participating in team activities.

Course Content:

Course Contents		Hrs.
Unit 01	Introduction to Design Thinking, Design Thinking Process	02
Unit 02	Empathize Phase: Empathy and Ethics, User Perspective, Activities – Empathy Map, Planning, Persona building.	02
Unit 03	Customer Journey Mapping, Observation of stakeholders, Defining and Conceptualization of problem	02
Unit 04	Ideation, Activities –5 Whys & 1 How, Story boarding, Brainstorming.	02
Unit 05	Prototype – Types, Mindsets, Tools.	02
Unit 06	Testing – Scenario, Methods, Refinements &Recommendations.	02

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Text Books:

Sr. No.	Title	Author	Publisher	Edition	Year of Edition
01	Understanding Design Thinking, Lean, and Agile	Jonny Schneider	O'Reilly	---	2017
02	Introduction to Design Thinking	S.Salivahanan, S.Suresh Kumar, D.Praveen Sam,	Tata McGraw Hill,	---	2019
03	Karmic Design Thinking - A Buddhism-Inspired Method to Help Create Human-Centered Products & Services	Prof. BalaRamadurai,	Self-Published	--	2020
04	Design: Creation of Artifacts in Society	Prof. Karl Ulrich, U. Penn	University of Pennsylvania	--	2011

Reference Books:

Sr. No	Title	Author	Publisher	Edition	Year of Edition
01	Design for How People Think	John Whalen	O'Reilly	---	2019
02	Change by Design	Tim Brown	HarperCollins	---	2009
03	Creative Confidence: Unleashing the Creative Potential Within Us All	Kelley, D. & Kelley, T	New York: William Collins	---	2014
04	Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days	Jack Knapp and others	Simon & Schuster	---	2009

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_A, Table –Tennis
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_A1	The students define table tennis game.
2MEHS119_A2	Willingly participates in Table Tennis as a component of an active lifestyle.
2MEHS119_A3	The students explain foot- work in forehand and backhand spin.

Course Contents:		Hrs.
Unit 1	Introduction & Understand basic Table Tennis rules, terminology, safety concerns, and scoring procedures.	04
Unit 2	Demonstrate proper court etiquette and good sportsmanship.	06
Unit 3	Demonstrate basic skills associated with table tennis including forehand, backhand, spins, grips & serves.	05
Unit 4	Demonstrate Exposition and Applying forehand and backhand straight strike.	05
Unit 5	Assess current personal fitness levels & Practice.	06
Unit 6	Use a variety of stroke placements to keep opponent moving during a table tennis match Practice.	04

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_B, Kho-Kho
Prerequisite/s	--
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_B1	Helps In Motor Development.
2MEHS119_B2	It helps in social and mental development of the student
2MEHS119_B3	Kho-Kho helps the student to off depression, anxiety, stress and, increase self-esteem.
2MEHS119_B4	It develops team spirit and leadership skill.
2MEHS119_B5	It improves physical fitness.

Course Contents:		Hrs.
Unit 1	Introduction to Kho-Kho – Aim – Objectives – Short reference in Kho-Kho history Understand the basic rules and how they should play normal game.	04
Unit 2	Demonstrate basic skills associated with Kho-Kho, including Fundamental Skills. Chasing Skills- a)Giving Kho b) Taking Direction c) Sudden Change d) Tapping	06
Unit 3	Demonstrate basic skills associated with Kho-Kho, including Fundamental Skills. Chasing Skills-e)Turning Round the Post f) Trapping g) Diving h) Fake Kho i) Late kho & Practice.	05
Unit 4	Demonstrate basic skills associated with Kho-Kho, including Running Skills a)Position on the court b) Avoiding Trapping c) Positioning near post d) Dodging	05
Unit 5	Demonstrate basic skills associated with Kho-Kho, including Running Skills e)Front Dodge f) Back Dodge c) Round the post dodge & Practice	06
Unit 6	Kho-Kho Skills Practice & Matches.	04

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_C, Basket Ball
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:

2MEHS119_C1	**Introduce** students to the basic skills and knowledge associated with basketball.
2MEHS119_C2	**By** applying these principles through active participation, students develop the necessary skills and knowledge to play basketball.
2MEHS119_C3	**Provides** students with opportunities to improve physical fitness, acquire knowledge of fitness concepts and practice positive personal and social skills
2MEHS119_C4	Students will gain an understanding of how a wellness lifestyle affects one's health, fitness and physical performance.

Course Contents:

		Hrs.
Unit 1	Introduction & Understand basic basketball rules, terminology, and safety concerns.	04
Unit 2	Demonstrate the six basic basketball skills of a) Running b) Jumping c) Passing d) catching e) Dribbling and f) Shooting.	06
Unit 3	Demonstrate the ability to perform individual offensive and defensive skills and strategies.	05
Unit 4	Understand and apply the knowledge of basic rules of basketball. Skills Practice.	05
Unit 5	Demonstrate proper etiquette and good sportsmanship. Successfully participates in skill improvement and offensive game strategies.	06
Unit 6	Identify and apply injury prevention principles related to aerobic activities. Practice & Matches.	04

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_D, Hand Ball
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_D1	The student has a basic knowledge of the team values of sports games
2MEHS119_D2	Acquainting with the characteristics and trends in the development of the discipline.

Course Contents:		Hrs.
Unit 1	Introduction & Understand basic Handball rules, terminology, and safety concerns.	04
Unit 2	Health and safety rules. Rules for obtaining credit for the course, Reminder of the history, methodology and basic rules of the game, Exercises to improve passing, grips and throws. The game. Reminder of the refereeing rules.	06
Unit 3	Improving the technique of passing and grips in a team setting. Individual ways of freeing oneself from the opponent and the organization of positional attacks with their use	05
Unit 4	Exercises improving feints and individual defense technique. Everyone's defense system. Principles of individual defense & Practice.	05
Unit 5	Improving the technique of passing and grips in a team setting. Individual ways of freeing oneself from the opponent and the organization of positional attacks with their use. The game & Practice.	06
Unit 6	Identify and apply injury prevention principles related to aerobic activities. Practice & Matches	04

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_E, Katthak Classical Dance
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_E1	Explain Importance of katthak with respect to Indian culture.
2MEHS119_E2	Demonstrate Guruvandana, Tatkar.
2MEHS119_E3	Compose Katthak dance with consideration of classical & semi classical music.

Course Contents:		Hrs.
Unit 1	Introduction to Classical dance Katthak & its importance.	01
Unit 2	Guruvandana & Tatkaar.(teen taal)	03
Unit 3	Chakri & Hast-sanchalan	03
Unit 4	Tode (Tigida-tigdig-thai)	03
Unit 5	Practice sessions.	02
Unit 6	Paran & Tihaei	05
Unit 7	Classical dance on Song	05
Unit 8	Practice sessions.	08

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_F,Tabla Classical instruments
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_F1	**Discover** History of table wadan.
2MEHS119_F2	**Demonstration** of different Taal in table wadan.
2MEHS119_F3	**Develop** notation on new music with help of table wadan.

Course Contents:		Hrs.
Unit 1	History& Introduction to Tabla Wadan.	01
Unit 2	Tabla presentation of Taal. Tritaal/ Dadra/ Zaptaal/ Kerwa/ Bhajni	05
Unit 3	Practice sessions.	06
Unit 4	Practice with notation ,& Set one song with tabla	08
Unit 5	Practice sessions & students presentations.	10

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	**2MEHS119_G, Western Dance**
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_G1	**Describe** History of Western dance & basic of western dance.
2MEHS119_G2	**Organize** western dance individually as well as group with help of western music.
2MEHS119_G3	**Compose** western dance on songs.

Course Contents:		**Hrs.**
Unit 1	History of Western dance style & information about western dance.	02
Unit 2	Basic types of western dance: - worm-up, Hand- legs movements.	04
Unit 3	Teaching Basic style (focus on dance / music / movements, how to control body, emotion/feeling of music/ dance.)	06
Unit 4	Training western dance with music (original dance form of western, free style dance)	08
Unit 5	Dance composition.	05
Unit 6	Practice session , & Students Presentation	05

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Course Details:

Class	F.Y. B.Tech: Semester-II
Course Code and Course Title	2MEHS119_H, Yoga
Prerequisite/s	---
Teaching Scheme: Lecture/Tutorial/Practical	00 / 00 / 02
Credits	01
Evaluation Scheme: ISE/ESE	50 / 00

Course Outcomes: Upon successful completion of this course, the student will be able to:	
2MEHS119_H1	Discus importance of Yoga with respect to different forms of exercise.
2MEHS119_H2	Perform Different styles of Yoga.

Course Contents:		Hrs.
Unit 1	**Introduction** , importance of yoga, Basic exercise, sun salutation, shavasana taught yogic & excises types	06
Unit 2	**Omkar** & sleeping position seats (aasan yogic excise type) to teach omkar in a scientific way, to teach mercatasan , makrasan, setubandhan.	04
Unit 3	**Opposite** sleeping position. Shalabhasan, chakras an, Bhungasan, Makrasan. Pranayam: - Anulom-Vilom, Bhasarika, Sheetkari, Bhramari, shitali pranayam. Rapid respiration (jaladshwasan)	05
Unit 4	**Practice** sessions	05
Unit 5	**Seats** in the sitting position: - padmasan, Wajrasan, Wakrasan, Ardh-machindrasana, Urshtrasan.	04
Unit 6	**Seats** in Fine Position. (Dandstithi):-Ekpaadvrukrashasan, Veerasan, Patangasan, Trikonasan.	06

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