



K.E. Society's
Rajarambapu Institute of Technology, Sakharale
(An Autonomous Institute, affiliated to Shivaji University, Kolhapur)
Proposed Curriculum Structure and Evaluation Scheme
To be implemented from 2018-19

Rev: SH Course Structure/RIT/01/2018-19

Department: Sciences and Humanities

Class: F. Y. B. Tech

Semester: I

Group A: Mechanical, Civil and Automobile Engineering

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
SH 131	Engineering Physics	3	-	-	3	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 1053	Engineering Mathematics I	3	1	-	4	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 1132	Engineering Graphics	1	-	-	1	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
	Open Elective - I	2	-	-	2	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 187	Engineering Physics Lab	-	-	2	1	ISE	---	---	100	50	
SH 1552	Engineering Graphics Lab	-	-	4	2	ISE	---	---	100	50	
	Open Elective - I Lab	-	-	2	1	ISE	---	---	100	50	
SH 1831/ SH 1582/ SH 1601	English Proficiency Lab I/ Japanese Language Lab Level I /German Language Lab Level I	-	-	4	2	ISE	---	---	60	50	
						ESE	---	---	40		
SH 185	Engineering Practice Lab I			2	1	ISE	---	---	100	50	
SH 189	Engineering Exploration and Design Project	-	-	4	2	ISE	---	---	80	50	
						ESE	---	---	20		
Total:		9	1	18	19						
Total Contact Hours:		28									

Total Contact Hours/week : 28

Total Credits : 19

ISE = In Semester Exam, MSE (UT1+UT2) UT-I = Unit Test-I, UT-II = Unit Test-II

ESE = End Semester Exam



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Rev: SH Course Structure/RIT/01/2018-19

Department: Sciences and Humanities

Class: F. Y. B. Tech

Semester: II

Group A: Mechanical, Civil and Automobile Engineering

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
SH 1033	Engineering Chemistry	3	-	-	3	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 1023	Engineering Mathematics II	3	1	-	4	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 1291	Electrical Engineering	3	-	-	3	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 133	Programming for Problem Solving	2	-	-	2	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---		---	
						ESE	50	20		---	---
SH 1532	Engineering Chemistry Lab	-	-	2	1	ISE	---	---	100	50	
SH 1791	Electrical Engineering Lab	-	-	2	1	ISE	---	---	100	50	
SH 191	Programming for Problem Solving Lab	-	-	4	2	ISE	---	---	100	50	
SH 162/ SH 1661 /SH168	English Proficiency Lab. II/ Japanese Language Lab Level II/ German Language Lab Level II	-	-	4	2	ISE	---	---	60	50	
						ESE	---	---	40		
SH 164	Engineering Practice Lab II	-	-	2	1	ISE	---	---	100	50	
Total:		11	1	14							
Total Contact Hours:		26			19						

Total Contact Hours/week : 26

Total Credits : 19

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Rev: SH Course Structure/RIT/01/2018-19

Department: Sciences and Humanities

Class: F. Y. B. Tech

Semester: I

Group B: Electronics & Telecommunication, Electrical, Computer Engineering & Information Technology

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
SH 1033	Engineering Chemistry	3	-	-	3	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---	---		
						ESE	50	20	---	---	
SH 1053	Engineering Mathematics I	3	1	-	4	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---	---		
						ESE	50	20	---	---	
SH 1291	Electrical Engineering	3	-	-	3	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---	---		
						ESE	50	20	---	---	
SH 133	Programming for Problem Solving	2	-	-	2	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	---	---		
						ESE	50	20	---	---	
SH 1532	Engineering Chemistry Lab	-	-	2	1	ISE	---	---	100	50	
SH 1791	Electrical Engineering Lab	-	-	2	1	ISE	---	---	100	50	
SH 191	Programming for Problem Solving Lab	-	-	4	2	ISE	---	---	100	50	
SH 1831/ SH 1582/ SH 1601	English Proficiency Lab I/ Japanese Language Lab Level I/ German Language Lab Level I	-	-	4	2	ISE	---	---	60	50	
						ESE	---	---	40		
SH 185	Engineering Practice Lab I	-	-	2	1	ISE	---	---	100	50	
Total:		11	1	14	19						
Total Contact Hours:		26									

Total Contact Hours/week : 26

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Approved First Year B. Tech Curriculum Structure to be implemented from Academic Year 2018-19



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Proposed Curriculum Structure and Evaluation Scheme
To be implemented from 2018-19

Rev: SH Course Structure/RIT/01/2018-19

Department: Sciences and Humanities

Class: F. Y. B. Tech

Semester: II

Group B: Electronics & Telecommunication, Electrical, Computer Engineering & Information Technology

Course Code	Course	Teaching Scheme				Evaluation Scheme					
		L	T	P	Credits	Scheme	Theory Marks		Practical Marks		
							Max.	Min. for Passing	Max.	Min. for Passing	
SH 106	Engineering Physics	3	-	-	3	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	20	---	---	
						ESE	50				
SH 1023	Engineering Mathematics II	3	1	-	4	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	20	---	---	
						ESE	50				
SH 1132	Engineering Graphics	1	-	-	1	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	20	---	---	
						ESE	50				
	Open Elective- I	2	-	-	2	ISE	20	20	40	---	---
						UT1	15			---	---
						UT2	15	20	---	---	
						ESE	50				
SH 1512	Engineering Physics Lab	-	-	2	1	ISE	---	---	100	50	
SH 1552	Engineering Graphics Lab	-	-	4	2	ISE	---	---	100	50	
	Open Elective- I Lab	-	-	2	1	ISE	---	---	100	50	
SH 162/ SH 1661 /SH168	English Proficiency Lab. II/ Japanese Language Lab Level II /German Language Lab Level II	-	-	4	2	ISE	---	---	60	50	
						ESE	---	---	40		
SH 164	Engineering Practice Lab II	-	-	2	1	ISE	---	---	100	50	
SH 189	Engineering Exploration and Design Project	-	-	4	2	ISE	---	---	80	50	
						ESE	---	---	20		
Total:		9	1	18	19						
Total Contact Hours:		28									

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Open Elective- I

Sr. No.	Course Code	Department	Course
1.	SE1011	Electronics and telecommunications Engineering	Basics of Electronics Engineering
2.	SE1511		Basics of Electronics Engineering Lab
3.	SE1051	Civil Engineering	Basics of Civil Engineering
4.	SE1551		Basics of Civil Engineering Lab
5.	SE1071	Mechanical Engineering	Thermodynamics
6.	SE1571		Thermodynamics Lab
7.	SE1091		Engineering Materials
8.	SE1591		Engineering Materials Lab
9.	SE1131	Civil Engineering	Green Technology
10.	SE1631		Green Technology Lab
11.	SE143	Automobile & Mechanical Engineering	Basics of Mechanical Engineering
12.	SE165		Basics of Mechanical Engineering Lab
13.	SE145	Mechanical Engineering	Creativity, Design Thinking and Entrepreneurial Mindset
14.	SE167		Creativity, Design Thinking and Entrepreneurial Mindset Lab

Humanities & Social Science: Choice Based Languages

Sr. No.	Course Code	Department	Course
1.	SH1831	Sciences and Humanities Department	English proficiency Lab I
2.	SH162		English proficiency Lab II
3.	SH1582		Japanese Language Lab Level I
4.	SH1661		Japanese Language Lab Level II
5.	SH1601		German Language Lab Level I
6.	SH168		German Language Lab Level II



K.E. Society's
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Syllabus (Theory & Laboratory Course)
To be implemented from **2018-19**

Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I	L	T	P	Credits
Course Code : SH131	Course Name : Engineering Physics (Auto, Civil and Mech)	3	--	--	3

Course Description:

There is symbiotic relation between Physics & Engineering. Broadly speaking Engineering is mainly Applied Physics. The present day technological developments have been the result of joint effort of physicists & engineers. A proper study of Physics is therefore indispensable for Engineering students to excel in his field. The physicist discovers scientific principles and invents devices to describe & explain them. The technician applies and magnifies these devices for human convenience and comfort.

Engineering, being the science of measurement, has been the off-spring of Physics which plays the primary role in the professional courses of all branches of Engineering and is generally taught during the first year of these courses. Engineering Physics is undergraduate course for F. Y. B. Tech in semester I. This course is specially designed for Auto, CIVIL and Mechanical branches. In this course student will learn physical concepts in optics, acoustics, ultrasonics, mechanics and semiconductors. Student will use this knowledge of physical concepts in different engineering applications.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Use the principles of interference, diffraction and polarization in thin reflecting films, diffraction gratings and polarimeter.
2. Apply the knowledge of architectural acoustics for acoustically good halls and principle of magnetostriction and piezoelectric methods for production of ultrasound.
3. Apply the Newton's laws of motion to calculate forces acting on objects.
4. Describe the behavior of a damped and driven harmonic oscillator.
5. Use the knowledge of semiconducting materials in semiconductor devices.
6. Explain the basics of LASER production and its applications.

Prerequisite:

Fundamentals in optics, sound, laws of motion and semiconductors.



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Syllabus (Theory & Laboratory Course)
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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I
Course Code : SH1053	Course Name : Engineering Mathematics-I

L	T	P	Credits
3	1	--	4

Course Description:

Engineering Mathematics – I is offered at the first semester of first year of four year engineering degree course. This course intends to build the competency in the students to apply the concepts learnt in respective modules to various engineering Problems. It contains six units which accomplish the fundamentals of mathematics required for Engineers. The units involved in the Course are: Curve Tracing and Rectification, Partial Differentiation and Applications, Special Functions, Multiple Integrals, Applications of Multiple Integrals.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Sketch the curve with full justification.
2. Apply the properties of special functions to evaluate integral.
3. Evaluate double integral and change the order of the integration.
4. Evaluate area bounded between two curves, mass of Lamina, moment of inertia.
5. Prove the results of partial differentiation.
6. Apply partial differentiation for evaluating and proving the results based on Errors and approximations, maxima and minima.

Prerequisite: Higher Secondary Mathematics.



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Syllabus (Theory & Laboratory Course)
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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SH1132	Course Name: Engineering Graphics

L	T	P	Credits
1	--	--	1

Course Description:

A picture speaks thousands of words. A message conveyed by a picture or a sign is much effective than a message conveyed by words. The human beings used the language of drawing to convey their ideas since before the start of civilization. With progress of science and technology, human felt the need for a 'standardized' drawing that it could be understood globally. This standardized graphical language was then termed as *Engineering Drawing*.

The languages of Engineering Drawing can be effectively used if its 'grammar' is mastered along with use of AutoCAD drawing software. This grammar refers to the use of standard conventions, notations and the methods used in technical drawing. This course aims to make students conversant with the grammar rules and methods in Engineering Drawing. This course also aims the students to learn the AutoCAD so that they can draw and make best use of it in drawing of Engineering Graphics.

Prerequisite: The knowledge of simple geometrical theorems and constructional procedure.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Determine the location of the location and orientation of point, line, and plane with respect to reference planes to draw their projection.
2. Develop the projection of various types of solids in various conditions.
3. Develop section views and true shape section of various types of solids
4. Identify the need of development of lateral surfaces and apply the same in engineering drawing.
5. Develop orthographic views of an object to convert pictorial view into two-dimension (2D) view.
6. Develop isometric view to convert two-dimension (2D) view to pictorial view.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I
Course Code : SH187	Course Name : Engineering Physics Lab (Auto, Mech. & Civil)

L	T	P	Credits
--	--	2	1

Course Description:

Engineering Physics Lab is the undergraduate course designed for F. Y. B. Tech in semester I. This course includes different experiments based on optics, mechanics, magnetic materials and semiconductors. The main objective of this course is student will be able to verify the theoretical concepts studied into practicals.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Apply the theory of semiconductors to calculate band gap energy and carrier concentration
2. Apply theory of interference and grating to calculate radius of curvature of plano convex lens and wavelength of light.
3. Compare B-H curve for different ferromagnetic materials and measure hysteresis loss in it.
4. Use ultrasonic interferometer to calculate velocity of ultrasound in given liquid.
5. Use Laurent's half shade polarimeter to calculate specific rotation of optically active solution.
6. Verify Newton's laws of motion and phenomena of resonance in forced oscillations.

Prerequisite:

Basics of semiconductor, laws of motion, wave theory of light, measurement skills, graph plotting and slope calculation.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SH1552	Course Name : Engineering Graphics Lab

L	T	P	Credits
--	--	4	2

Course Description:

A picture speaks thousands of words. A message conveyed by a picture or a sign is much effective than a message conveyed by words. The human beings used the language of drawing to convey their ideas since before the start of civilization. With progress of science and technology, human felt the need for a 'standardized' drawing that it could be understood globally. This standardized graphical language was then termed as *Engineering Drawing*.

The languages of Engineering Drawing can be effectively used if its 'grammar' is mastered along with use of AutoCAD drawing software. This grammar refers to the use of standard conventions, notations and the methods used in technical drawing. This course aims to make students conversant with the grammar rules and methods in Engineering Drawing. This course also aims the students to learn the AutoCAD so that they can draw and make best use of it in drawing of Engg. Graphics.

Prerequisite : Knowledge of simple geometrical theorems and constructional procedure

Course Outcomes:

After successful completion of the course, student will be able to,

1. Determine the location of the location and orientation of point, line, and plane with respect to reference planes to draw their projection.
2. Develop the projection of various types of solids in various conditions.
3. Develop section views and true shape section of various types of solids
4. Identify the need of development of lateral surfaces and apply the same in engineering drawing.
5. Develop orthographic views of an object to convert pictorial view into two-dimension (2D) view.
6. Develop isometric view to convert two-dimension (2D) view to pictorial view.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester- I
Course Code : SH1831	Course Name: English Proficiency Lab I

L	T	P	Credits
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Course Description:

The objective of the course is to train students to acquire language and applied grammar skills practically. Practical course in English Proficiency Lab I addresses students' listening, speaking, reading, writing and soft (fundamental) skills. We provide personal attention to individual student's performances.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Demonstrate reception skills of language
2. Communicate using oral and written modes.
3. Make use of English language with grammatical accuracy.
4. Articulate correctly the frequently used words using phonemic transcriptions

Prerequisite:

A Student, who is going to enroll himself for this course, should have following English language abilities:

1. A student should have knowledge of basic grammar of English language.
2. A student should have an intermediate level vocabulary of English language.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I	L	T	P	Credits
Course Code : SH1582	Course Name: Japanese Language Lab Level I	--	--	4	2

Course Description:

This course is designed to introduce students to the everyday language of Japan. Lessons will be organized around natural conversational topics, leading students from fundamental aspects of grammar to readings in simple texts.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Demonstrate Japanese scripts through oral and written communication.
2. Express themselves by using simple sentences and responses to questions.
3. Demonstrate effective listening.
4. Make use of Japanese etiquette

Prerequisite: Nil



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I	L	T	P	Credits
Course Code : SH1601	Course Name: German Language Lab Level I	--	--	4	2

Course Description:

This course provides an opportunity to enhance acquisition of the fundamental elements of the German language. Emphasis is on the progressive development of basic listening, speaking, reading, and writing skills through the use of supplementary learning media and materials.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Make use of familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type.
2. Express him /herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has.
3. Interact in a simple way provided the other person talks slowly and clearly and is prepared to help.
4. Make use of the basic grammar concepts correctly.
5. Demonstrate reading and writing skills.



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Syllabus (Theory & Laboratory Course)
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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester- I	L	T	P	Credits
Course Code : SH185	Course Name: Engineering practice Lab I	--	--	2	1

Course Description:

Workshop practice imparts basic knowledge of various tools and their uses in different sections of manufacturing such as Fitting, Tin Smithy, House Wiring, Carpentry etc. It is true that engineers are not going to become carpenters or blacksmiths or skilled workers on the shop floor, but by exposing themselves to all working trades, they get a bird eye view of the basic practical activities associated with all sections of manufacturing. It helps them, when they occupy managerial positions, in understanding the activities and practical difficulties, so that they can take appropriate decisions.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Acquire skills in basic engineering practice.
2. Use of hand tools and power tools.
3. Develop sheet metal model for specific application.
4. Understand the various operations performed in machine shop.
5. Perform different joining operations
6. Perform pipe fittings operations.



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Department of Sciences and Humanities

Class:- First Year B. Tech.	Semester- I/II	L	T	P	Credits
Course Code : SH189	Course Name : Engineering Exploration & Design Project	--	--	4	2

Course Description:

The Engineering Exploration course is an introduction to engineering concepts with a focus on critical thinking, creativity, teamwork, communication, and working across different engineering disciplines. Students will be introduced to various disciplines as well as engineering design processes through a semester-long project, providing a design-built-test experience. This course makes students familiar with Engineering Design, Project and Constraints Management, Multi-disciplinary nature of engineering, problem solving, data acquisition analysis, Team Building, Engineering Ethics & Sustainability.

Students are expected to complete the mini project by applying the engineering concepts/principles taught in the course. Students could join (maximum 4 students) together, form a small team, and execute a simple project in multi-disciplinary engineering field under the guidance of course teachers. The continuous assessment of the Project work will be carried out by evaluating project work.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Explain the role of an Engineer as a problem solver.
2. Design engineering solutions to complex problems utilizing multi-disciplinary systems approach.
3. Examine a given problem using process of engineering problem analysis.
4. Build simple systems/prototypes using engineering design and development process.
5. Analyze engineering solutions from ethical and sustainability perspectives.
6. Apply basics of engineering project management skills in project development.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SH1033	Course Name: Engineering Chemistry

L	T	P	Credits
3	--	--	3

Course Description:

Engineering Chemistry is offered as the core science course at the semester of first year engineering degree course; containing six modules. The Modules involved in the Course are Basic Concepts in Chemistry, Analytical techniques, Water treatment, Batteries and fuel cell, Corrosion and its Control, Fuels and Lubricants.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Understand basic concepts of Chemistry.
2. Select the correct instrumental techniques for the examination of materials.
3. Demonstrate knowledge of science behind normal polluting influences in water and strategies to treat them.
4. Utilize the electrochemical principle for selection of proper batteries.
5. Apply the science for understanding corrosion and its prevention.
6. Compare types and quality of fuels by different instruments and select the proper lubricant and lubrication method.

Prerequisite:

The prerequisite for this course is applied chemistry including knowledge of XIIth Std. Chemistry. This course intends to build the competency in the students to apply the concepts learnt in respective modules to various engineering fields.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-II
Course Code : SH1023	Course Name: Engineering Mathematics-II

L	T	P	Credits
3	1	--	4

Course Description:

Engineering Mathematics – II is offered as the core science course at the second semester of first year of four-year engineering degree course. It contains six Units. The Units involved in the Course are: Matrices, Ordinary Differential Equations of First order & First Degree, Application of Ordinary Differential Equation, Solution of Simultaneous Algebraic Equations, Finite Differences and Interpolation, Numerical Solution of Ordinary Differential Equations. This course intends to build the competency in the students to apply the Mathematical concepts to various Engineering Problems.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Use the concepts of matrices that serve as an essential basis for several computational techniques.
2. Solve the differential equations by choosing proper method of solution.
3. Solve the problems on orthogonal trajectories, simple electrical circuits, and heat flow by applying the methods of Ordinary Differential Equations.
4. Use the relevant method for solving simultaneous algebraic linear equations.
5. Apply the relevant numerical method for interpolating the polynomial.
6. Apply appropriate numerical method to compute the solution of ordinary differential equations.

Prerequisite: Higher Secondary Mathematics.



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Class:- First Year B. Tech	Semester-I/II
Course Code : SH1291	Course Name: Electrical Engineering

L	T	P	Credits
3	--	--	3

Course Description:

Engineering students of almost all disciplines have to undergo this course as a core subject in the first year. It is needless to mention that how much we are dependent on electricity in our day to day life. A reasonable understanding on the basics of applied electricity is therefore important for every engineer. Apart from learning D.C. and A.C. circuit analysis both under steady state and transient conditions, students will learn basic working principles and analysis of transformer, D.C. motors and induction motor. Finally working principles of some popular and useful power converters and electrical components and L.T. switchgear are presented. The course can be broadly divided into 3 major parts, namely: Electrical circuits, Electrical Machines and Components & Converters.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Solve Magnetic circuits, D.C. and A.C. electric circuits
2. Describe construction, working and application of transformers
3. Describe construction, working and application of different types of commonly used rotating machines.
4. Classify power converters on the basis of application.
5. Suggest suitable capacity of wires, cables switchgear and illumination system for low-voltage electrical installations.

Prerequisite:

(Courses: Physics, Mathematics)

Concept of potential difference, current and resistance. Ohm's law. Fundamentals of electromagnetics.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SH133	Course Name: Programming for Problem Solving

L	T	P	Credits
2	--	--	2

Course Description:

This is an introductory course of C programming language for problem solving so as to improve the computational /logical thinking of students.

This course focuses on basic fundamentals of C language including Data types, Operators, I/O Statements, Control Statements, Function, Array, Pointer and Structure.

This course makes students familiar with the use of computers for scientific calculations, use of programming languages and the logic for writing computer programs involving problems from Mathematics and Statistics, Physics, Chemistry.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Explain the basic terminology and concepts of C programming language.
2. Write Algorithm and draw flow chart for the given problem.
3. Write a C Programs for given problems
4. Analyze the given C Program to predict the output.
5. Evaluate the C program to resolve the errors.

Prerequisite:

This course is programming course to solve the problems, So the students must have basic knowledge of mathematics. No prior programming knowledge is required;



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SH1532	Course Name: Engineering Chemistry Lab

L	T	P	Credits
--	--	2	2

Course Description:

Engineering Chemistry Laboratory experiments related to the six modules in theory course. The Modules involved in the Course are Analytical techniques, Water treatment, Corrosion and its Control, Batteries and fuel cell, Fuels, and Lubricants.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Examine the materials by using analytical instruments.
2. Identify the quality of water for industrial and domestic purposes.
3. Apply the knowledge of electrochemistry for design of various cells and batteries.
4. Select proper Lubricant for different machines according to working condition.
5. Inspect the quality of fuel.

Prerequisite: The prerequisite for this course is applied chemistry including knowledge of XIIth Std. Chemistry. This course intends to build the competency in the students to apply the concepts learnt in respective modules to various engineering fields.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SH1791	Course Name: Electrical Engineering Lab

L	T	P	Credits
--	--	2	1

Course Description:

The experiments are designed to expose students to the practical executions of the fundamental theories of Electrical Engineering. The lab also reinforces the concepts discussed in class with a hands-on approach and allow the students to gain significant experience with electrical circuits and instruments such as ammeter, multimeter and wattmeter.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Acquaint with the basic concepts and properties of electrical circuits and awareness about safety precautions.
2. Select proper meter/s for measuring electrical quantities during experiments.
3. Explain various electrical circuits (DC, AC) and magnetic circuits through laboratory practices.
4. Demonstrate various power converter for desired application.
5. Choose circuit breakers for specific application

Prerequisite:

(Courses: Physics, Mathematics)

Concept of potential difference, current and resistance. Ohm's law. Fundamentals of electromagnetics.



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Class:- First Year B. Tech	Semester-I/II
Course Code : SH191	Course Name : Programming for Problem Solving Lab

L	T	P	Credits
--	--	4	2

Course Description:

This is an introductory course of C programming language for problem solving so as to improve the computational /logical thinking of students.

This course focuses on basic fundamentals of C language including Datatypes, Operators, I/O Statements, Control Statements, Function, Array, Pointer and Structure.

This course makes students familiar with the use of computers for scientific calculations, use of programming languages and the logic for writing computer programs involving problems from Mathematics and Statistics, Physics, Chemistry.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Describe orally the basic terminology and concepts of C programming language.
2. Write an Algorithm and draw the flow chart for the given problem
3. Write a 'C' programs for a given problem
4. Compile , execute and debug the 'C' programs for a given problem

Prerequisite:

This course is programming course to solve the problems, So the students must have basic knowledge of mathematics. No prior programming knowledge is required;



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester- II
Course Code : SH162	Course Name: English Proficiency Lab II

L	T	P	Credits
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Course Description:

This course comprises comprehensive areas i.e. reading, writing, communicative grammar and fundamentals of technical communication. By introducing the units like Technical Paragraph Development, Writing Business Letters, Technical Reports and Information Transfer the syllabus aims at preparing the basics of the future necessities of the aspirants from the technical field. The course aims to equip students with communication skills suitable for their academic purposes. It is further meant to develop in students skills necessary for effective communication in business and life in general.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Demonstrate writing skills through letters, circulars, notices, memos, and emails.
2. Apply report writing skills.
3. Organize message in appropriate structures.
4. Prepare job application addressing requirements of the post.

Prerequisite:

A Student, who is going to enroll himself for this course, should have following English language abilities:

1. A student should have adequate knowledge of basic grammar of English language.
2. A student should have intermediate level vocabulary of English language.
3. A student should be able to communicate moderately using English language.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester- II
Course Code : SH1661	Course Name : Japanese Language Lab Level II

L	T	P	Credits
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Course Description:

This course is designed to introduce students to the everyday language of Japan. Units will be organized around natural conversational topics, leading students from fundamental aspects of grammar to readings in simple texts. Students will learn vocabulary, expressions, and sentence structures to become able to meet basic communication needs in Japanese. This course comprises all four skills (speaking, listening, reading, and writing) of language.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Converse in Standard Japanese to perform basic communicative tasks (e.g., exchange greetings/personal information, give time/directions/daily activities)
2. Make use of Japanese vocabulary effectively.
3. Demonstrate reading comprehension

Prerequisite: Nil



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Class:- First Year B. Tech	Semester-II
Course Code : SH168	Course Name : German Language Lab Level II

L	T	P	Credits
--	--	4	2

Course Description:

This course provides an opportunity to enhance acquisition of the fundamental elements of the German language. Emphasis is on the progressive development of basic listening, speaking, reading, and writing skills through the use of supplementary learning media and materials.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type.
2. Express him/her and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and things he/she has.
3. Interact in a simple way provided the other person talks slowly and clearly and is prepared to help.
4. Make use of basic grammar concepts correctly.
5. Demonstrate reading and writing skills.

Prerequisite: Nil



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Class:- First Year B. Tech	Semester-II
Course Code :SH164	Course Name : Engineering practice- Lab II

L	T	P	Credits
--	--	2	1

Course Description:

To familiarise with the basic manufacturing processes and to study the various tools and equipment used, hands-on training is given in different sections. Essentially student should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Make wooden job.
2. Make Sheet metal job.
3. Make job by various machining processes.
4. Make job by joining processes.

Prerequisite:

Based on the skills acquired by students in Semester-I, they will choose any two jobs of their interest and make them with the help of these skills individually.



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Class:- First Year B. Tech	Semester-II
Course Code : SH106	Course Name: Engineering Physics (CSE, Elect., ETC & IT)

L	T	P	Credits
3	--	--	3

Course Description:

There is symbiotic relation between Physics & Engineering. Broadly speaking Engineering is mainly Applied Physics. The present day technological developments have been the result of joint effort of physicists & engineers. A proper study of Physics is therefore indispensable for Engineering students to excel in his field. The physicist discovers scientific principles and invents devices to describe & explain them. The technician applies and magnifies these devices for human convenience and comfort.

Engineering Physics is undergraduate course for F. Y. B. Tech in semester II. This course is specially designed for CSE, Electrical, ETC and IT branches. This course contains theory of Acoustics, Quantum Physics, LASER, Fiber optics semiconductors & magnetic materials. Student will use this knowledge of physical concepts in different engineering applications.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Use the knowledge of architectural acoustics in the proper design of a Hall/Auditorium.
2. Apply the knowledge of Piezoelectric and Magnetostriction effect for production of ultrasonic waves and its application in various fields.
3. Select appropriate magnetic materials depending on its properties for various applications
4. Explain fundamentals of quantum mechanics and apply it to one dimensional motion of particles
5. Apply the knowledge of semiconducting materials in semiconductor devices.
6. Use different optoelectronic devices as per need.

Prerequisite:

Basics in sound, magnetism, semiconductors & optics.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-II
Course Code : SH1512	Course Name: Engineering Physics Lab (CSE, Elect. ETC & IT)

L	T	P	Credits
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Course Description:

Engineering Physics Lab is the undergraduate course designed for F. Y. B. Tech in semester II. This course includes different experiments based on optics, magnetic materials, semiconductors and fiber optics. The main objective of this course is student will be able to verify the theoretical concepts they have studied in practicals.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Apply the theory of semiconductors to calculate band gap energy and carrier concentration
2. Apply theory of interference and grating to calculate radius of curvature of plano convex lens and wavelength of light.
3. Compare B-H curve for different ferromagnetic materials and measure hysteresis loss in it.
4. Determine resolving power of telescope and numerical aperture of optical fiber.
5. Use ultrasonic interferometer to calculate velocity of ultrasound in given liquid.
6. Use Laurent's half shade polarimeter to calculate specific rotation of optically active solution.

Prerequisite:

Basic of semiconductor, wave theory of light, measurement skills, graph plotting and slope calculation.



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Open Elective-I Courses



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Class:- First Year B. Tech	Semester-I/II	L	T	P	Credits
Course Code : SE1011	Course Name: Basics of Electronics Engineering	2	--	--	2

Course Description:

This course introduces the characteristics and applications of electronics devices and circuits. Emphasis is placed on selection of components, biasing, and building applications. Upon completion, students should be able to construct, verify, and troubleshoot analog/digital circuits using appropriate techniques and test equipment.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Select basic electronic components and devices used for different electronic applications.
2. Apply fundamentals of diode, transistor, OPAMP to build their applications.
3. Compute the conversions of different number systems like Binary, Decimal, Hex, Oct.
4. Simplify the logic expression using Boolean algebra & Karnaugh Map.

Prerequisite:

Basic course on Mathematics.



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Class:- First Year B. Tech	Semester-I/ II
Course Code : SE1511	Course Name : Basics of Electronics Engineering Lab

L	T	P	Credits
--	--	2	1

Course Description:

The laboratory portion of this course provides students with the opportunity to develop skills in the operation of basic electronics test instruments (dc power supply, digital multimeter, signal generator, and oscilloscope). Students will work in groups of two or more to perform and complete laboratory exercises. Students must be able to communicate, both in oral and written form, using the English language.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Demonstrate use of various electronic components & equipments for building applications.
2. Build the circuits using Diode, Transistor Electronics Devices.
3. Construct various applications using Operational Amplifier like Amplifiers.
4. Test the basic logic gates, adders & subtractors.

Prerequisite:

Basic Electronics Knowledge.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SE1051	Course Name : Basics of Civil Engineering

L	T	P	Credits
2	--	--	2

Course Description:

Basics of Civil Engineering is an elective course offered in autonomous program at undergraduate level for I/II semester. The main objective of this course is to focus on building components, building planning principles, property transaction procedures, surveying and different modes of transportation. To a civil engineer, study of infrastructural development, its planning and execution is very much important and hence the course is designed to highlight various construction aspects of building and transportation facilities, its management and different modes.

Course Learning Outcomes:

After successful completion of this course, student will be able to:

1. Apply fundamental knowledge of civil engineering.
2. Identify building components and materials used in construction along with concepts of sustainability and safety of buildings.
3. Use basic principles of planning in the building design and processes involved in the property transactions.
4. Determine horizontal and vertical distances using modern surveying instruments.
5. Describe various components of transportation system.

Prerequisite:

Student should possess fundamental knowledge of mathematics and science.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SE1551	Course Name : Basics of Civil Engineering Lab

L	T	P	Credits
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Course Description:

Basics of Civil Engineering Lab is a choice based course offered in autonomous program at undergraduate level for I/II semester. Main objective of this Lab is to focus on Reading of working and submission drawing, Use building planning principles, study documents required in property transaction procedures and Surveying. To a civil engineer use of plan, drawings, calculation of area of irregular shape and to find the level difference between two points is very much of important.

Course Learning Outcomes:

After successful completion of the course, student will be able to,

1. Draw dimensioned sketch/plan of building.
2. Plan building using principles and bye laws.
3. Perform horizontal and vertical measurement.
4. Use modern surveying techniques.

Prerequisite:

Student should have fundamental knowledge of Mathematics and Science.



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Class:- First Year B. Tech	Semester-I/II
Course Code : SE1071	Course Name : Thermodynamics

L	T	P	Credits
2	--	--	2

Course Description:

The aim of this course is to provide students the basic concepts of thermodynamic systems and their applications. It also covers the basic properties of gases, liquids and vapors (specific heat capacities), energy, entropy, enthalpy, exergy, anergy, laws of thermodynamics, ideal gas mixtures; and efficiencies of energy conversion systems, such as boilers, turbines, condensers, pump.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Apply thermodynamics principles to mechanical engineering applications
2. Describe entropy, change in entropy and increase of entropy principle.
3. Differentiate between available and unavailable energy with examples.
4. Apply mathematical fundamental to study the properties of steam, gas and gas mixtures.

Prerequisite:

Students should know Concept of energy, work, heat and conversion between them.



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Class:- First Year B. Tech	Semester-I/II
Course Code : SE1571	Course Name : Thermodynamics Lab

L	T	P	Credits
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Course Description:

The main objective of this lab is to develop an idea of fuel properties and their variation with temperature, determination of kinematic viscosity and calorific value of fuels. It also covers study of boiler and their mountings.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Conduct test to find properties of oils
2. Explain boilers and mountings
3. Estimate the properties of steam, interpret and comment on the results.

Prerequisite:

Students should know Concept of energy, work, heat and conversion between them.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester- I/II
Course Code : SE1091	Course Name : Engineering Materials

L	T	P	Credits
2	--	--	2

Course Description:

This course will familiarize the student with the properties of engineering materials and composite materials. The students will be introduced to evaluation of mechanical properties by destructive testing and flaw detection by nondestructive testing methods.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Illustrate stress strain diagram for different materials.
2. Explain evaluation of mechanical properties using destructive testing methods.
3. Select suitable non-destructive testing method for flaw detection in component.
4. Select suitable material for different components.

Prerequisite: Students should have knowledge of crystal structures of metals.



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Department of Sciences and Humanities

First Year B. Tech	Semester- I/II
Course Code : SE1591	Course Name: Engineering Materials Lab

L	T	P	Credits
--	--	2	1

Course Description: This lab familiarizes the students with evaluation of mechanical properties by destructive testing methods

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Illustrate stress strain diagram for different materials.
2. Use Rockwell Hardness testing machine to measure hardness of material.
3. Measure impact strength of the metals
4. Determine fatigue strength of metals.
5. Determine flaws in the component using non-destructive testing methods.
6. Explain working principle of emission spectrometer.



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester-I/II
Course Code : SE1131	Course Name: Green Technology.

L	T	P	Credits
2	--	--	2

Course Description:

Today entire globe is facing problem of global warming and climate change. This course is to create awareness among young engineers who will take this challenge for caring nature. Green Technology course is offered as an elective course for first year engineering all programmes. This course deals with continuously evolving group of methods, materials and processes from environmentally caring techniques. The goals of this rapidly growing highly interdisciplinary course focuses on- i) sustainability - meeting the needs of society in ways that without damaging or depleting natural resources ii) innovation - developing alternatives to technologies to those that have been demonstrated to damage health and the environment and source reduction iii) reducing waste and pollution by changing patterns of production and consumption. This course will help to create awareness about eco-friendly technology.

Course Learning Outcomes:

After successful completion of the course, student will be able to,

1. Explain the basic principles of green chemistry and ecology.
2. Discuss different waste processing techniques.
3. Describe various Green innovations for sustainability.
4. Discuss concept of green buildings and green management.
5. Prepare energy and water budget for a building.

Prerequisite:

Student should have fundamental knowledge of basic science.



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Class:- First Year B. Tech	Semester-I/II
Course Code : SE1631	Course Name: Green Technology Lab.

L	T	P	Credits
--	--	2	1

Course Description:

Today entire globe is facing problem of global warming and climate change. This course is to create awareness among young engineers who will take this challenge for caring nature. Green Technology course is offered as an elective course for first year engineering all programmes. This course deals with continuously evolving group of methods, materials and processes from environmentally caring techniques. The goals of this rapidly growing highly interdisciplinary course focuses on- i) sustainability - meeting the needs of society in ways that without damaging or depleting natural resources ii) innovation - developing alternatives to technologies to those that have been demonstrated to damage health and the environment and source reduction iii) reducing waste and pollution by changing patterns of production and consumption. This course will help to create awareness about eco-friendly technology.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Explain the concept of green technology/green building.
2. Prepare energy and water budget for a building.
3. Design rainwater harvesting for a small catchment area.
4. Analyze air quality by using HC/CO analyzer.

Prerequisite: Nil



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Department of Sciences and Humanities

Class:- First Year B. Tech	Semester- I/II
Course Code : SE143	Course Name : Basics of Mechanical Engineering

L	T	P	Credits
2	--	--	2

Course Description:

This is a basic course at first year engineering level. It consists of basic knowledge in Mechanical and Automobile engineering, which is of key importance to the students of all engineering streams. There are total six units covering all the basic fundamentals of Mechanical and Automobile engineering. Few units deal with power generation systems, power transmission and energy conversion devices. While others are related to Vehicles and their prime components, IC engines, material used in engineering and different manufacturing processes. At the end of successful completion of this course, the students will be perfectly clear regarding the basic concepts of Mechanical and Automobile engineering.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Explain different power generation systems.
2. Select appropriate energy conversion device for the given application.
3. Classify vehicles on the basis of different parameters.
4. Compare two stroke and four stroke IC engines.
5. Describe different transmission devices in a given system.
6. Choose suitable materials and manufacturing processes for a given application.

Prerequisite: Nil



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Class:- First Year B. Tech	Semester-I/II
Course Code : SE165	Course Name : Basics of Mechanical Engineering Lab

L	T	P	Credits
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Course Description:

This is laboratory course which will demonstrate the different components of power generation systems. Also students will get the hands on experience related to day to day maintenance work of machines.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Explain the different components of power generation systems.
2. Identify the systems and components of vehicle.
3. Distinguish between two stroke and four stroke engines.
4. Carry out day to day life maintenance of machines.
5. Explain the different components of power generation systems.

Prerequisite: Nil



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Department of Sciences and Humanities

Class-First Year B. Tech	Semester-I/II
Course Code: SE145	Course Name: Creativity, Design Thinking and Entrepreneurial Mindset

L	T	P	Credits
2	--	--	2

Course Description:

This course helps students to learn creativity in the context of Entrepreneurship. It provides a structured approach for applying creativity, problem identification and problem solving in order to cope up with challenges under constrained and uncertain environment. It provides a systematic approach for design thinking and Jobs-to-be-Done to innovate and develop solutions. It provides ingredients to develop a mindset of a successful entrepreneur.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Learn structured approach to creativity, problem identification and problem solving in a new venture context
2. Apply design thinking approach to identify innovation opportunities and develop solutions
3. Identify, validate and define specific innovation opportunities through Jobs-to-be-Done methodology
4. Develop mindset of a successful entrepreneur

Prerequisite: Nil



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Class-First Year B. Tech	Semester-I/II
Course Code: SE167	Course Name: Creativity, Design Thinking and Entrepreneurial Mindset Lab

L	T	P	Credits
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Course description/ Course Objectives:

This practical work provides a structured approach for applying creativity, problem identification and problem solving. It provides a systematic approach for design thinking and Jobs-to-be-Done to innovate and develop solutions. This work helps students to develop the Entrepreneurial mind set.

Course Learning Outcomes:

After successful completion of the course, students will be able to,

1. Learn structured approach to creativity, problem identification and problem solving in a new venture context.
2. Apply design thinking approach to identify innovation opportunities and develop solutions.
3. Develop mindset of a successful entrepreneur.

Prerequisite: Nil