VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
(Deemed to be University)

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, CHENNAI
&
VINAYAKA MISSION'S KIRUPANANDA VARIYAR ENGINEERING COLLEGE, SALEM

FACULTY OF ENGINEERING AND TECHNOLOGY

STRUCTURED CHOICE BASED CREDIT SYSTEM

BOARD : ELECTRICAL AND ELECTRONICS ENGINEERING
REGULATION : 2017
PROGRAM : B.Tech – ELECTRICAL AND ELECTRONICS ENGINEERING (FULL TIME - REGULAR)

CURRICULUM AND SYLLABUS

SEMESTER – II								
S.NO	**COURSE CODE**	**COURSE TITLE**	**OFFERING DEPARTMENT**	**CATEGORY**	**L**	**T**	**P**	**C**
THEORY								
1		DIFFERENTIAL EQUATIONS AND TRANSFORMS	MATHEMATICS	FC(BS)	2	2	0	**3**
2		PROGRAMMING IN PYTHON	CSE	FC(ES)	3	0	0	**3**
3		ELECTRIC CIRCUIT ANALYSIS	EEE	CC	3	0	0	**3**
4		SMART MATERIALS	PHYSICS	FC(BS)	3	0	0	**3**
5		BASICS OF CIVIL AND MECHANICAL ENGINEERING	CIVIL & MECHANICAL	FC(ES)	4	0	0	**4**
PRACTICAL								
6		PROGRAMMING IN PYTHON LAB	CSE	FC(ES)	0	0	4	**2**
7		ENGINEERING GRAPHICS (Theory + Practice)	MECHANICAL	FC(ES)	1	0	4	**3**
8		ELECTRIC CIRCUITS LAB	EEE	CC	0	0	4	**2**
9		ENGINEERING SKILLS PRACTICE LAB A. BASIC CIVIL ENGINEERING B. BASIC MECHANICAL ENGINEERING	CIVIL & MECHANICAL	FC(ES)	0	0	4	**2**
TOTAL					**16**	**2**	**16**	**25**
L – LECTURE HOUR		T – TUTORIAL HOUR		P – PRACTICAL HOUR			C – CREDIT	

HSS	HUMANITIES AND SOCIAL SCIENCES	CC	CORE COURSES
BS	BASIC SCIENCES	EC	ELECTIVE COURSES
ES	ENGINEERING SCIENCES	EEC	EMPLOYABILITY ENHANCEMENT COURSES + EXTRA CURRICULAR COURSES + CO - CURRICULAR COURSES
PII	PROJECT + INTERNSHIP + INDUSTRY ELECTIVES		

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE **: DIFFERENTIAL EQUATIONS AND TRANSFORMS**	**L**	**T**	**P**	**C**
	TOTAL HOURS: **60**	**2**	**2**	**0**	**3**
	PREREQUISITE : **ENGINEERING MATHEMATICS**				

PURPOSE:

To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.

INSTRUCTIONAL OBJECTIVES :

1.	To familiarize with the applications of differential equations.
2.	To equip themselves familiar with Laplace transform
3.	To gain good knowledge in the application of Fourier transform
4.	To learn about Z- transforms and its applications
5.	Fourier series has the wide application in the field of heat diffusion, wave propagation and in signal and systems analysis.

UNIT – I	**ORDINARY DIFFERENTIAL EQUATIONS**	**12**

Solutions of second and third order linear ordinary differential equation with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT – II	**LAPLACE TRANSFORMS**	**12**

Laplace transform – transform of elementary functions – basic properties – derivatives and integrals of transforms – transforms of derivatives and integrals – initial and final value theorems – Transform of periodic functions-Inverse Laplace transform – Convolution theorem – -Solution of linear ODE of second order with constant coefficients

UNIT – III	**FOURIER SERIES**	**12**

Dirichlet's conditions - General Fourier series - Half-range Sine and Cosine series - Parseval's identity - Harmonic Analysis.

UNIT – IV	**FOURIER TRANSFORMS**	**12**

Fourier transform pairs - Fourier Sine and Cosine transforms – Properties - Transforms of simple functions - Convolution theorem - Parseval's identity.

UNIT – V	**Z – TRANSFORMS**	**12**

Z-Transform – Elementary Properties – Inverse Z-Transform – Convolution Theorem – Formation of Difference Equations – Solution of first and second order Difference Equations using Z-Transform.

TEXT BOOKS:

1. "Engineering mathematics I & II", Department of Mathematics, VMKVEC (Salem) & AVIT (Chennai), (2017).
2. Dr.A.Singaravelu, "Engineering Mathematics I & II", 23rd Edition, Meenakshi Agency, Chennai (2016).

REFERENCES:

1. Veerarajan, T., "Engineering Mathematics", Tata McGraw Hill Publishing Co., New Delhi (2011).
2. Grewal, B.S., "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi (2012).
3. Kreyszig, E., "Advanced Engineering Mathematics", 8th Edition, John Wiley and Sons (Asia) Pvt Ltd., Singapore (2012).
4. Kandasamy .P., Thilagavathy. K., and Gunavathy. K., "Engineering Mathematics", Volumes I & II (10th edition), S. Chand & Co., New Delhi (2014).

COURSE CODE :
NAME OF THE COURSE : DIFFERENTIAL EQUATIONS AND TRANSFORMS

COURSE DESIGNED BY		**DEPARTMENT OF MATHEMATICS**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√				√						
2	Mapping of instructional objectives with student outcome	1,2				3,4, 5						
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
			√									

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **PROGRAMMING IN PYTHON**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **45**	**3**	**0**	**0**	**3**
	PREREQUISITE : **NIL**				

PURPOSE:

The purpose of this course is to introduce Python, a remarkably powerful dynamic programming language, to write code for different operating systems along with application domain. Python has evolved on more popular and powerful open source programming tool.

INSTRUCTIONAL OBJECTIVES:

1.	Able to setup Python working environment.
2.	To understand the object oriented features of Python.
3.	To develop Network Applications using Python.
4.	To develop Web Applications using Python.
5.	To use and develop GUI applications in Python programming.

UNIT – I	**INTRODUCTION**	**9**

Introduction to Python – Advantages of Python programming – Tokens – Keywords - Variables – I/O methods - Data types – Operators.

UNIT – II	**DATA STRUCTURES**	**9**

Strings - List - Tuples - Dictionaries – Sets.

UNIT – III	**CONTROL STATEMENTS**	**9**

Flow Control – Selection Control Structure – If – if-else – if-elif-else – nested if Iterative control structures: while loop, for loop and range.

UNIT – IV	**FUNCTIONS**	**9**

Declaration – Types of arguments – Fixed arguments, default arguments, keyword arguments, variable arguments, and keyword variable arguments – Recursion – Anonymous functions: lambda - Generators – Decorators.

UNIT – V	**EXCEPTION HANDLING**	**9**

Exception Handling - Regular Expression - Calendars and Clocks Files: File I/O operations – Directory Operations– Reading and Writing in Structured Files: CSV and JSON.

TEXT BOOK:

1. Bill Lubanovic, "Introducing Python Modern Computing in Simple Packages", 1st Edition, O'Reilly Media, 2014.

REFERENCES:

1. Mark Lutz, “Learning Python”, 5th Edition, O'Reilly Media, 2013.
2. David Beazley, Brian K. Jones, "Python Cookbook", 3rd Edition, O'Reilly Media, 2013.
3. Mark Lutz, “Python Pocket Reference”, 5th Edition, O'Reilly Media, 2014.
4. www.python.org.
5. www.diveintopython3.net.

COURSE CODE : **NAME OF THE COURSE : PROGRAMMING IN PYTHON**												
COURSE DESIGNED BY		**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√				√						√
2	Mapping of instructional objectives with student outcome	1-5				1-5						1-5
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **ELECTRIC CIRCUIT ANALYSIS**	**L**	**T**	**P**	**C**
	TOTAL HOURS: **45**	**3**	**0**	**0**	**3**
	PREREQUISITE : **NIL**				

PURPOSE:

To study concepts of basic circuits, Network theorems, resonance and coupled circuits, balanced and unbalanced circuits and transient analysis of circuits.

INSTRUCTIONAL OBJECTIVES:

1.	To understand basic circuit concepts.
2.	To study networks and solution of DC and AC circuits.
3.	To understand series and parallel resonance concepts and analysis of coupled circuits.
4.	To study protection of balanced and unbalanced loads and measurement of power and power factor in three phase circuits.
5.	To understand transient analysis of RL, RC and RLC circuits with DC and sinusoidal excitations.

UNIT – I	BASIC CIRCUIT CONCEPTS	9

Review of basic concepts- DC & AC circuits - R, L, and C elements phasor diagrams-Complex impedance - Real & Reactive power- Series & Parallel circuits– Formation of matrix equations and analysis of complex circuits using mesh- Current and nodal - Voltage methods.

UNIT – II	NETWORK THEOREMS AND TRANSFORMATIONS	9

Voltage – Current – Source transformation. Star Delta transformation - Superposition theorem – Reciprocity theorem – Substitution theorem – Maximum Power Transfer theorems – Thevenin's theorem – Norton's theorem and Millman's theorem with applications.

UNIT – III	RESONANCE AND COUPLED CIRCUITS	9

Series resonance and parallel resonance – Bandwidth and Q factor. Inductively coupled circuits - Co-efficient of coupling - Dot convention - Multi winding coupled circuits - Analysis of coupled circuits.

UNIT – IV	THREE PHASE CIRCUITS	9

Analysis of three phase 3 wire and 4 wire circuits with star and delta connected balanced and unbalanced loads-phasor diagram of Voltages and Currents – Measurement of power and power factor in three phase circuits by using single, two and three Watt meter method.

UNIT – V	TRANSIENT ANALYSIS	9

Transient response – Natural response- forced response – DC response of RL, RC and RLC circuits – sinusoidal response of RL, RC, RLC circuits.

TEXT BOOKS:

1. Dr.S. Arumugam, Premkumar, "Circuit Theory", Khanna publishers, 1991.
2. Sudhakar, A. and Shyam Mohan S.P., "Circuits and Network Analysis and Synthesis", Tata McGraw-Hill Publishing C.Ltd., New Delhi, 2006.

REFERENCES:

1. Prof. T. NageswaraRao, "Electric Circuit Analysis" A. R. Publications.
2. Hyatt, W.H. Jr and Kemmerly, J.E., "Engineering Circuits Analysis", McGraw-Hill International Editions, 2002.
3. Edminister, J.A., "Theory and Problems of Electric Circuits", Schaum's outline series McGraw Hill Book Company, 5th Edition, 2011.

COURSE CODE :
NAME OF THE COURSE : ELECTRIC CIRCUIT ANALYSIS

COURSE DESIGNED BY		**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√				√						
2	Mapping of instructional objectives with student outcome	1-5				1-5						
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
					√							

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **SMART MATERIALS**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **45**	**3**	**0**	**0**	**3**
	PREREQUISITE : **PHYSICAL SCIENCES**				

PURPOSE:

The fundamental knowledge gained will be useful for various applications in Engineering & Technology.

INSTRUCTIONAL OBJECTIVES:

1.	To understand the properties of smart materials.
2.	To understand the structure of crystalline materials.
3.	To learn the synthesis of Nano materials.
4.	To learn the properties and classification of magnetic materials.
5.	To understand the concept of superconducting materials and their properties.

UNIT – I	**SMART MATERIALS**	**9**

Shape Memory Alloys (SMA) – Characteristics and properties of SMA, Application, advantages and disadvantages of SMA. Metallic glasses – Preparation, properties and applications.

UNIT – II	**CRYSTALLINE MATERIALS**	**9**

Unit cell – Bravais lattice – Miller indices – Calculation of number of atoms per unit cell – atomic radius – coordination number – packing factor for SC, BCC, FCC, HCP structures.

UNIT – III	**NANO MATERIALS**	**9**

Nanophase materials – Top-down approach - Mechanical Grinding – Lithography – Bottom-up approach – Sol-gel method – Carbon nanotubes – Fabrication – applications.

UNIT – IV	**MAGNETIC MATERIALS**	**9**

Basic concepts – Classification of magnetic materials – Domain theory – Hysteresis – Soft and Hard magnetic materials.

UNIT – V	**SUPERCONDUCTING MATERIALS**	**9**

Superconducting phenomena – properties of superconductors – Meissner effect – isotope effect – Type I and Type II superconductors – High T_c Superconductors – Applications of superconductors.

TEXT BOOK:

1. Mani P, “Engineering Physics II”, Dhanam Publications, 2011.

REFERENCES:

1. Pillai S.O., “Solid State Physics”, New Age International (P) Ltd., publishers, 2009.
2. Senthilkumar G., “Engineering Physics II”, VRB Publishers, 2011.

COURSE CODE : **NAME OF THE COURSE : SMART MATERIALS**												
COURSE DESIGNED BY		**DEPARTMENT OF PHYSICS**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√	√	√	√	√		√	√	√	√	√
2	Mapping of instructional objectives with student outcome	3	1	1	3	5		2	4	3	5	1
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
			√									

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **BASICS OF CIVIL AND MECHANICAL ENGINEERING PART A – BASIC CIVIL ENGINEERING**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **30**	**2**	**0**	**0**	**2**
	PREREQUISITE : **NIL**				

PURPOSE:

The aim of the subject is to provide a fundamental knowledge of basic Civil Engineering.

INSTRUCTIONAL OBJECTIVES:

1.	To understand the basic concepts of surveying and construction materials.
2.	To impart basic knowledge about building components.

UNIT – I	SURVEYING AND CIVIL ENGINEERING MATERIALS	15

Surveying: Objects – types – classification – principles – measurements of distances – angles – levelling – determination of areas – illustrative examples.
Civil Engineering Materials: Bricks – stones – sand – cement – concrete – steel sections.

UNIT – II	BUILDING COMPONENTS AND STRUCTURES	15

Foundations: Types, Bearing capacity – Requirement of good foundations.
Superstructure: Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Mechanics – Internal and external forces – stress – strain – elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

TEXT BOOK:

1. "Basic Civil and Mechanical Engineering", VMU, (2017).

REFERENCES:

1. Ramamrutham S., "Basic Civil Engineering", Dhanpatrai Publishing Co. (P) Ltd., 2009.
2. Seetharaman S., "Basic Civil Engineering", Anuradha Agencies.

COURSE CODE :
NAME OF THE COURSE : BASICS OF CIVIL AND MECHANICAL ENGINEERING
PART A – BASIC CIVIL ENGINEERING

COURSE DESIGNED BY		**DEPARTMENT OF CIVIL ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√			√							
2	Mapping of instructional objectives with student outcome	1,2			1,2							
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **BASICS OF CIVIL AND MECHANICAL ENGINEERING PART B - BASIC MECHANICAL ENGINEERING**	**L**	**T**	**P**	**C**
	TOTAL HOURS: **30**	**2**	**0**	**0**	**2**
	PREREQUISITE: **NIL**				

PURPOSE:

The aim of the subject is to provide knowledge of fundamentals of Mechanical Engineering.

INSTRUCTIONAL OBJECTIVES :

1.	To understand foundry and welding processes of manufacturing.
2.	To impart fundamentals of automotive engines and important components.

UNIT – I	FOUNDRY AND WELDING	15

Foundry: Introduction to Casting – Types, Pattern – Definition, Function. Foundry tools. Green Sand Moulding application.

Welding: Introduction to welding, Classification – Gas welding, Arc Welding, TIG, MIG, Plasma – Definitions. Arc Welding – Methods and Mechanisms – Applications.

UNIT – II	AUTOMOTIVE ENGINES AND COMPONENTS	15

Introduction, Two stroke and four stroke cycle – Petrol and Diesel Engines – Construction and working.
Fundamentals of automotive components – Brakes, Clutches, Governor, Flywheel, Axles, Drives etc., Fuel supply systems, Exhaust emission and control.

TEXT BOOK:

1. "Basic Civil and Mechanical Engineering", School of Mechanical Engineering Sciences, VMU, Salem, (2017).

REFERENCES:

1. K.Venugopal, V.Prabhu Raja, G. Sreekanjana, "Basic Civil and Mechanical Engineering", Anuradha Publications.
2. G.Shanmugam, M.S.Palanichamy, "Basic Civil and Mechanical Engineering", Tata McGraw Hill Publications.

COURSE CODE :
NAME OF THE COURSE : BASICS OF CIVIL AND MECHANICAL ENGINEERING
PART B - BASIC MECHANICAL ENGINEERING

COURSE DESIGNED BY		**DEPARTMENT OF MECHANICAL ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√				√						
2	Mapping of instructional objectives with student outcome	1-2				1-2						
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **PROGRAMMING IN PYTHON LAB**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **60**	**0**	**0**	**4**	**2**
	PREREQUISITE : **NIL**				

PURPOSE:

This course will help the students to gain the in-depth knowledge in Python Programming.

INSTRUCTIONAL OBJECTIVES:

1.	To understand Control Structures.
2.	To understand Concept of Arrays.
3.	To implement Functions and files.

LIST OF EXPERIMENTS:

1. Write a Program to sum the series of N numbers.
2. Write a Program to calculate Simple Interest.
3. Write a Program to generate Fibonacci Series using for loop.
4. Write a program to calculate factorial using while loop.
5. Write a Program to
   a) Find the greatest of three numbers using if condition.
   b) Find the greatest of three numbers using conditional operator.
6. Write a program for finding the roots of a given quadratic equation using conditional control statements.
7. Write a program to compute matrix multiplication using the concept of arrays.
8. Write a program to compute matrix multiplication using the concept of arrays.
9. Write a program to implement recursive function.
10. Write a program to read and write data using file concepts.

REFERENCE:

1. Laboratory Reference Manual.

COURSE CODE :
NAME OF THE COURSE: PROGRAMMING IN PYTHON LAB

COURSE DESIGNED BY		**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√				√						√
2	Mapping of instructional objectives with student outcome	1-5				1-5						1-5
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE: **ENGINEERING GRAPHICS (Theory + Practice)**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **60**	**1**	**0**	**4**	**3**
	PREREQUISITE : **NIL**				

PURPOSE:

The aim of the subject is to provide knowledge of fundamentals of mechanical Engineering.

INSTRUCTIONAL OBJECTIVES:

1.	To know about different types of lines and curves and represent letters and numbers in drawing sheets.
2.	To know projection of points, straight lines.
3.	To know projection of various solids.
4.	To know about the section of solids and development of different types of surfaces.
5.	To know about isometric projection and different angle of projection.

UNIT – I	**PLANE CURVES AND FREE HAND SKETCHING**	**9**

Conics – Construction of ellipse– First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT – II	**AUTOMOTIVE ENGINES AND COMPONENTS**	**9**

Projection of points, Projection of straight lines located in the first quadrant: inclined to both planes – Determination of true lengths and true inclinations – rotating line method only.

UNIT – III	**PROJECTION OF SOLIDS**	**9**

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to any one reference plane by change of position method.

UNIT – IV	**SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES**	**9**

Sectioning of above solids in simple vertical position by cutting planes inclined to any one reference plane and perpendicular to the other – Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids like Prisms, pyramids, cylinders and cones.

UNIT – V	**ISOMETRIC VIEW AND PERSPECTIVE PROJECTION**	**9**

Principles of isometric View – isometric scale – isometric view of simple solids – Introduction to Perspective projection.

TEXT BOOKS:

1. N.D. Bhatt, "Engineering Drawing" Charotar Publishing House, 46th Edition, (2003).
2. K. V. Natarajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2006).

REFERENCES:

1. M.S. Kumar, "Engineering Graphics", D.D. Publications, (2007).
2. K. Venugopal & V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited.
3. M.B. Shah and B.C. Rana, "Engineering Drawing", Pearson Education (2005).
4. K. R. Gopalakrishnana, "Engineering Drawing", (Vol.I & II), Subhas Publications (1998).

COURSE CODE: **NAME OF THE COURSE : ENGINEERING GRAPHICS** (Theory + Practice)												
COURSE DESIGNED BY		**DEPARTMENT OF MECHANICAL ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√		√								√
2	Mapping of instructional objectives with student outcome	1-5		1-5								1-5
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **ELECTRIC CIRCUITS LAB**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **60**	**0**	**0**	**4**	**2**
	PREREQUISITE : **NIL**				

PURPOSE:

This laboratory course will give the student a thorough knowledge about the basics of circuit analysis.

INSTRUCTIONAL OBJECTIVES:

1.	Understand and gain knowledge about circuit laws and theorems.
2.	Gain knowledge about time domain analysis of circuit transients.
3.	Understand the concept of resonance in series and parallel circuits.

LIST OF EXPERIMENTS:

1. Verification of Ohm's Law.
2. Verification of Kirchhoff's laws.
3. Verification of Thevenin's Theorem.
4. Verification of Norton's Theorem.
5. Verification of Superposition theorem.
6. Verification of Reciprocity theorem.
7. Verification of Maximum Power Transfer theorem.
8. Time Domain analysis of RL transient circuits.
9. Time Domain analysis of RC transient circuits.
10. Series Resonance Circuit.
11. Parallel Resonance Circuit.
12. Three Phase Power Measurement by Two Wattmeter method.

COURSE CODE :
NAME OF THE COURSE : ELECTRIC CIRCUITS LAB

COURSE DESIGNED BY		**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
			√	√								
2	Mapping of instructional objectives with student outcome		1,2,3	4,5								
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
					√							

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE : **ENGINEERING SKILLS PRACTICE LAB PART A - BASIC CIVIL ENGINEERING**	**L**	**T**	**P**	**C**
	TOTAL HOURS : **30**	**0**	**0**	**2**	**1**
	PREREQUISITE : **NIL**				

PURPOSE:

The aim of the subject is to provide a fundamental knowledge of basic Civil Engineering.

INSTRUCTIONAL OBJECTIVES:

1.	Ability to fabricate carpentry components and pipe connections including plumbing works.

LIST OF EXPERIMENTS:

Buildings:

1. Study of plumbing and carpentry components of residential and industrial buildings, Safety aspects.

Plumbing Works:

2. Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
3. Study of pipe connections requirements for pumps and turbines.
4. Preparation of plumbing line sketches for water supply and sewage works.
5. Hands-on-exercise: Mixed pipe material connection – Pipe connections with different joining components.
6. Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

7. Study of the joints in roofs, doors, windows and furniture.
8. Hands-on-exercise: Wood work, joints by sawing, planning and cutting.

REFERENCE:

1. Laboratory Reference Manual.

COURSE CODE:
NAME OF THE COURSE : ENGINEERING SKILLS PRACTICE LAB
PART A - BASIC CIVIL ENGINEERING

COURSE DESIGNED BY		**DEPARTMENT OF CIVIL ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√	√									√
2	Mapping of instructional objectives with student outcome	1	1									1
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

COURSE CODE	SEMESTER – II				
	NAME OF THE COURSE: **ENGINEERING SKILLS PRACTICE LAB PART B - BASIC MECHANICAL ENGINEERING**	**L**	**T**	**P**	**C**
	TOTAL HOURS: **30**	**0**	**0**	**2**	**1**
	PREREQUISITE: **NIL**				

PURPOSE:

The aim of the subject is to make students understand the basic manufacturing operations.

INSTRUCTIONAL OBJECTIVES:

1.	To create ability to make fittings, casting moulds, wooden joints and welding joints.

LIST OF EXPERIMENTS:

1. Tee – Fitting
2. Vee – Fitting
3. Preparation of a mould for a single piece pattern
4. Preparation of a mould for a split piece pattern
5. Half- Lap Joint in Carpentry
6. Dove Tail Joint in Carpentry
7. Lap Joint – Welding
8. Butt Joint – Welding

REFERENCES:

"Engineering Skill Practices Lab Manual", School of Mechanical Sciences, VMU.

COURSE CODE :
NAME OF THE COURSE : ENGINEERING SKILLS PRACTICE LAB
PART B - BASIC MECHANICAL ENGINEERING

COURSE DESIGNED BY		**DEPARTMENT OF MECHANICAL ENGINEERING**										
1	Student Outcomes	a	b	c	d	e	f	g	h	i	j	k
		√	√	√	√	√						
2	Mapping of instructional objectives with student outcome	1	1	1	1	1						
3	Category	HSS	BS	ES	CC	EC	EEC	PII				
				√								

CATEGORY :			
HSS	HUMANITIES AND SOCIAL SCIENCES	CC	CORE COURSES
BS	BASIC SCIENCES	EC	ELECTIVE COURSES
ES	ENGINEERING SCIENCES	EEC	EMPLOYABILITY ENHANCEMENT COURSES + EXTRA CURRICULAR COURSES + CO - CURRICULAR COURSES
PII	PROJECT + INTERNSHIP + INDUSTRY ELECTIVES		

STUDENT OUTCOMES :	
a.	An ability to apply knowledge of Mathematics, Science and Engineering.
b.	An ability to design and conduct experiments, as well as to analyze and interpret data.
c.	An ability to design a system, component, or process to meet desired needs within realistic constraints such as Economic, Environmental, Social, Political, Ethical, Health and Safety, Manaufaturability and Sustainability.
d.	An ability to function on Multi Disciplinary Teams.
e.	An ability to identify, formulate and solve Engineering Probems.
f.	An understanding of professional and Ethical Responsibility.
g.	An ability to Communicate Effectiely.
h.	The broad education necessary to understand the impact of Engineering Solutions in Global, Economic, Environmental and Social Context.
i.	A recognition of the need for, and an ability to engage in Life-Long Learning.
j.	A knowledge of contemporary issues.
k.	An ability to use the Techniques, Skills and Modern Engineering Tools necessary for Engineering Practice.