

# **SCHOOL OF ENGINEERING**

**B. TECH. (ELECTRONICS & COMMUNICATION ENGINEERING)** 

**SYLLABUS BOOK** 

AY 2025-26

# **INSTITUTE VISION**

To emerge as an Institute of Excellence by imparting value-based education aided with Research, Innovation and Entrepreneurial skills.

	INSTITUTE MISSION
1.	To impart the holistic engineering education of highest quality & prepare socially responsible
	professionals with entrepreneurial skills.
2.	To prepare value-aided engineering professionals to meet up global industry requirements by
	imparting cutting edge professional education.
3.	To inculcate the attitude of research and innovation among the stake holders through
	experiential and project-based teaching-learning pedagogy.
4.	To acquire global talent pool by providing world class amenities for teaching, learning &
	research.

Graduates will demonstrate ability to:

PEO No	PROGRAMME EDUCATIONAL OBJECTIVES
PEO 1	Solve real-world engineering problems, design and develop innovative and cost-effective
	solutions exhibiting engineering skills/fundamentals to cater needs of society.
PEO 2	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting
	comprehensive competitiveness.
PEO 3	Exhibit professional ethics & values, effective communication, teamwork, multidisciplinary
	approach, and ability to relate engineering issues to broader societal framework.

PO No	PROGRAMME OUTCOMES
PO 1	Engineering knowledge:
	Apply knowledge of engineering fundamentals, science, mathematics & engineering
	specialization for the solution of complex engineering problems.
PO 2	Problem analysis:
	Identify, formulate and analyze complex engineering problems leading to substantial
	conclusions using basic principles of mathematics, science and engineering.
PO 3	Design/development of solutions:
	Develop solutions for complex engineering problems and design system components or
	processes meeting specified needs having due consideration for the safety and societal &
	environmental considerations.
PO 4	Conduct investigations of complex problems:
	Use research-based knowledge & methods like design of experiments, analysis and interpretation
	of data, and synthesis of the information to provide valid & viable conclusions.
PO 5	Modern tool usage:
	Create, select, and apply appropriate techniques, resources, and modern engineering and IT
	tools for prediction and modeling of complex engineering activities with an understanding of the
	limitations.
PO 6	The engineer and society:
	Apply cognitive learning by the contextual knowledge to assess societal, health, safety, legal
	and cultural issues and following responsibilities relevant to the professional engineering
	practice.
PO 7	Environment and sustainability:
	Understand the impact of the professional engineering solutions in societal and
	environmental contexts, and demonstrate the knowledge & skill needed for sustainable
DO O	development.
PO 8	Values & Ethics:
	Apply basic moral values & ethical principles and pledge to professional ethics/norms and
DO 0	responsibilities of the engineering practice.
P0 9	mulviuuai and team work:
	Function enectively as an individual/as a team member of as a leader in diverse teams, and m
PO 10	Communication:
1010	Communicate effectively on complex engineering activities with the engineering community
	and with society at large such as being able to comprehend and write effective reports and
	design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance:
	Demonstrate knowledge and understanding of the engineering and management principles
	and apply these to one's own work, as a member and leader in a team, to manage projects in
	multidisciplinary environments.
PO 12	Life-long learning:
	Recognize the need, do necessary preparation and ability to engage in independent and life- long
	learning in the broadest context of technological change.

Credit Guidelines (General)									
Component	Hour/Week	Credit	Total Hours/Semester						
Theory	1	1	15						
Practical	2	1	30						
Tutorial	1	1	15						
Note: In specifi	Note: In specific cases; extra credits can be granted for specific/important subjects.								

CO-PO Mapping Guidelines									
Mapping Level	% age Mapping	Indicator							
0 / -	0	No Mapping							
1	0-33	Low Level (Slightly Mapped)							
2	33-66	Medium Level (Moderately Mapped)							
3	>66	High Level (Strongly Mapped)							

# Syllabus Book

# B. Tech. (ELECTRONICS & COMMUNICATION ENGINEERING



P P Savani University

School of Engineering

Effective From: 2025-26 Authored by: P P Savani University

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# FIRST YEAR B. TECH.



				PP	SAVANI UNI	VERSITY									
	SCHOOL OF ENGINEERING														
	TEACHING & EXAMINATION SCHEME FOR FIRST YEAR ELECTRONICS & COMMUNICATION ENGINEERING PROGRAMME AY: 2025-26														
						Teachi	ng Schem	e			]	Exami	nation	Scheme	<u>.</u>
Sem	Course	Course Title	Offered			Contact Hou	rs		Tł	neory	Pra	ctical	Tutorial		
	Lode	Course Hue	Ву	Theory	Practical	Tutorial	Total	Credit	CE	ESE	CE	ESE	CE	ESE	Total
	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1210	Basics of Mechanical Engineering	ME	3	0	2	5	5	40	60	0	0	100	0	200
	SEIT1210	Python for Engineers	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SESH1130	Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	3	0	0	3	3	40	60	0	0	0	0	100
	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECV1210	Basics of Civil Engineering	CV	3	0	2	5	5	40	60	0	0	100	0	200
	SECE1210	Programming with C Essentials	CE	3	2	0	5	4	40	60	40	60	0	0	200
1 OR 2	SEEC1210	Basics of Electrical and Electronics	EC	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1220	Engineering Workshop	ME	0	2	0	2	2	0	0	40	60	0	0	100
	SECE1220	Digital Proficiency	IT	3	0	0	3	3	40	60	0	0	0	0	100
						Total	48	44							1900

	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1210	Basics of Mechanical Engineering	ME	3	0	2	5	5	40	60	0	0	100	0	200
Group	SEIT1210	Python for Engineers	CE	3	2	0	5	4	40	60	40	60	0	0	200
1	SESH1130	Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	3	0	0	3	3	40	60	0	0	0	0	100
							23	21	ç						900
	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECV1210	Basics of Civil Engineering	CV	3	0	2	5	5	40	60	0	0	100	0	200
	SECE1210	Programming with C Essentials	CE	3	2	0	5	4	40	60	40	60	0	0	200
Group 2	SEEC1210	Basics of Electrical and Electronics	EC	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1220	Engineering Workshop	ME	0	2	0	2	2	0	0	40	60	0	0	100
	SECE1220	Digital Proficiency	IT	3	0	0	3	3	40	60	0	0	0	0	100
						Total	25	23							1000

#### **Department of Science and Humanities**

Course Code: SESH1110 Course Name: Calculus Prerequisite Course/s: Algebra, Geometry, Trigonometry & Pre-Calculus till 12<sup>th</sup> Standard level

#### **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)					Examination Scheme (Marks)							
Theory	Practical	Tutorial	Credit	The	Theory		eory Practical		tical	Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE			
03	-	02	05	40	60	-	-	100	-	200		

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the course:**

To help learners to

- summarize concept of calculus to enhance ability of analysing mathematical problems.
- acquire knowledge and ability to work with differentiation and integration for applications of mathematical techniques in engineering.
- develop the tool of convergence or divergence of any infinite series and power series for learning advanced Engineering Mathematics.
- acquire knowledge of partial differentiation and ability to work with applications to advanced Engineering Mathematics.
- application of concavity of graph and find out points of inflection.

	Section I						
Module No.	Content	Hours	Weightage in %				
1.	<b>Calculus</b> Limits, Continuity, Types of Discontinuity, Successive Differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima.	09	20				
2.	Sequence and Series-I Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence.	09	20				
3.	Sequence and Series-II Power series, Taylor and Maclaurin series, Indeterminate forms and L'Hospital's Rule.	05	10				
	Section II	1					
Module No.	Content	Hours	Weightage in %				
4.	Partial Derivatives	11	30				

	Function of several variables, Partial differentiation, Applications,		
	Chain rule, Linear approximations, Maxima and Minima, Euler's		
	theorem, Lagrange multiplier.		
	Curve tracing		
5.	Tracing of Cartesian Curves, Polar Coordinates, Polar and Parametric	11	20
	Form of Standard Curves, Areas and Length in Polar co-ordinates		
	TOTAL	45	100

#### List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Calculus-1	04
2.	Calculus-2	04
3.	Calculus-3	02
4.	Sequence and Series-1	04
5.	Sequence and Series-2	02
6.	Sequence and Series-3	02
7.	Partial Derivatives-1	04
8.	Partial Derivatives-2	02
9.	Curve tracing-1	04
10.	Curve tracing-2	02
	TOTAL	30

# **Text Book:**

Title	Author(s)	Publication
Thomas' Calculus	George B. Thomas, Maurice D. Weir and Joel	Pearson
	Hass	
Elementary linear Algebra	Howard Anton and Chrish Rorres	Wiley

#### **Reference Book:**

Title	Author(s)	Publication
Advanced Engineering Mathematics	E Kreyszig	John Wiley and Sons
A textbook of Engineering Mathematics	N P Bali and Manish Goyal	Laxmi
Higher Engineering Mathematics	B S Grewal	Khanna
Engineering Mathematics	T Veerarajan	Tata Mc Graw Hill
Engineering Mathematics-1 (Calculus)	H. K. Dass and Dr. Rama Verma	S. Chand

# **Course Evaluation:**

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

# Tutorial:

- Continuous Evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 50 marks
- Continuous Evaluation consists of self-performance assignment to 20 marks.

• Internal Viva consists of 30 marks.

# Course Outcome(s):

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

SESH1110	CALCULUS
CO 1	Recall the concepts of limit, continuity and differentiability for analysing
	mathematical problems.
CO 2	Analyze the series for its convergence and divergence to solve real world problems.
CO 3	Evaluate various limit problems using L'Hospital's rule.
CO 4	Identify the ordinary differentials and partial differentials and solve the maximum
	and minimum value of function.
CO 5	Construct the graphs for function with intervals and identify more application for
	function.

# Mapping of CO with PO

SESH1110	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	2	3	1	1								1
CO 2	3	2	1									1
CO 3	2	2	1									
CO 4	2	2	1	1								1
CO 5	2	2	1									1

# Mapping of CO with PSO

SESH1110	PSO1	PSO2	PSO3
CO 1	3		
CO 2	1	1	
CO 3	1	2	
CO 4	3	2	
CO 5	1	1	

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Calculus	1, 2, 3, 4, 5
2	Sequence and Series – I	1, 2, 3, 4, 6
3	Sequence and Series – II	1, 2, 3, 4, 6
4	Partial Derivatives	1, 2, 3, 4, 5
5	Curve tracing	1, 2, 3, 4, 5, 6

# **Department of Mechanical Engineering**

Course Code: SEME1210 Course Name: Basics of Mechanical Engineering Prerequisite Course(s): -- None

# **Teaching & Examination Scheme:**

Tea	Teaching Scheme (Hours/Week)			Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Pra	ctical	Tut	orial	Total
				CE	ESE	CE	ESE	CE	ESE	
03	-	02	05	40	60	-	-	100	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- study the fundamentals of mechanical systems.
- study and appreciate significance of mechanical engineering in different fields of engineering.
- carry out simple land survey and recent trends in civil engineering.
- understand components of building, building terminology and construction materials.

	Section I					
Module No.	Content	Hours	Weightage in %			
1.	Introduction to Boiler: Introduction, Fundamental Principles, Classification	07	15			
2.	<b>Classification of Engineering Materials:</b> Classification of engineering material, composition of cast iron, mechanical properties and uses; Alloy steel and their applications; Stress-Strain diagram, Hooks law and modulus of elasticity. Tensile, shear and hardness.	10	20			
3.	Fluids: Fluid properties, pressure, density and viscosity; pressure variation with depth, static and kinetic energy; Bernoulli's equation for incompressible fluids, viscous and turbulent flow and Metacentric height.	04	08			
4.	<b>Measurement:</b> Temperature, pressure, velocity, flow, strain, force and torque measurement, concept of measurement error & uncertainty analysis, measurement by Vernier caliper, micrometer, dial gauges, slip gauges, sine-bar and combination set.	06	12			
	Section 2					
Module No.	Content	Hours	Weightage in %			

5.	<b>Basic Concepts of Thermodynamics:</b> Prime Movers - Meaning and Classification; the Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific Heat Capacity, Internal Energy, Specific Volume; Thermodynamic Systems, All Laws of Thermodynamics	04	09
6.	<b>Basics of I.C Engines:</b> Construction and Working of 2 Stroke & 4 Stroke Petrol andDiesel Engines, Difference Between 2-Stroke - 4 Stroke Engine & Petrol- Diesel Engine, Efficiency of I. C. Engines	08	18
7.	<b>Power Transmission Elements:</b> Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types ofBelt Drive and Gear Drive	06	18
	TOTAL	45	100

# List of Practical:

Sr No	Name of Practical	Hours
51. NU.		
1.	To understand construction and working of various types of boilers	04
2.	To understand construction and working of mountings	04
3.	To understand construction and working of accessories	04
4.	To understand construction and working 2 –stroke & 4 –stroke Petrol Engines	02
5.	To understand construction and working 2 –stroke & 4 –stroke Diesel Engines	02
6.	To understand the types of hardness test	
7.	To understand the stress-strain curve for ductile and brittle material	
8.	To understand the basic concept of metacentric height	
	TOTAL	30

# Text Book(s):

Title	Author(s)	Publication
Elements of Mechanical Engineering	S. B. Mathur, S. Domkundwar	Dhanpat Rai & Sons Publications
Material Science	Narula	ТМН
Basic Mechanical Engineering	Agrawal B & CM	ТМН
Instrumentation and Measurement	Nakra and Chaudhary	ТМН
Combustion Engines	Ganesan	ТМН.

#### **Reference Book(s):**

Title	Author(s)	Publication
Thermal Engineering	R. K. Rajput	Laxmi Publications
Basic Mechanical Engineering	T.S. Rajan	Wiley Eastern Ltd., 1996.

# Web Material Link(s):

- http://nptel.ac.in/course.php
- http://nptel.ac.in/courses/105107157/
- http://nptel.ac.in/courses/105101087/
- http://nptel.ac.in/courses/105107121/
- http://nptel.ac.in/courses/105104100/

# **Course Evaluation:**

Theory:

- Continuous evaluation consists of two tests each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

# Tutorial

- Continuous Evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.

# Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

<b>SEME1210</b>	BASICS OF MECHANICAL ENGINEERING
CO 1	Understand the concept of Boiler, Material types and its application.
CO 2	Understand the Fluid properties and measurement process.
CO 3	Understand the concept of basic thermodynamics
CO 4	Comprehend the importance of mechanical engineering equipments like IC engine and
	power transmission elements.

#### Mapping of CO with PO

<b>SEME1210</b>	P01	PO2	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	2	3	1	3	2	2						3
CO 2	2	3	1	3	2	2						3
CO 3	1	3	1	3	2	2						3
CO 4	1	3	1	3	2	2						3

# Mapping of CO with PSO

SEME1210	PSO1	PSO2	PSO3				
CO 1	2	2	2				
CO 2	2	2	2				
CO 3	3	2	2				
CO 4	3	2	2				

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Boiler	1, 2, 3
2	Classification of Engineering Materials	1, 2
3	Fluids	1, 2
4	Measurement	1, 2
5	Basics Concept of Thermodynamics	1, 2, 3
6	Basics of I.C. Engines	1, 2
7	Power Transmission Elements	1, 2

# **Department of Computer Engineering**

Course Code: SEIT1210 Course Name: Python for Engineers Prerequisite Course(s): --

#### **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)			Examination Scheme (Marks)							
Theory	Dractical	Tutorial	Cradit	The	eory	Prac	ctical	Tut	orial	Total
Theory	Plactical	Tutorial	Crean	CE	ESE	CE	ESE	CE	ESE	TOLAI
03	02	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- understand the basic object-oriented programming.
- identify an appropriate approach to solve computational problems.
- develop logic building and problem-solving skills.

Section I						
Module No.	Content	Hours	Weightage in %			
1.	<b>Introduction to Python</b> History, Features of Python, Applications of Python, Working with Python, Input and Output Functions in Python, Variable, Assignment, Types, Basic Operators, Expressions and Types of Data Int, Float, Complex, String, List, Tuple, Set, Dictionary and its Methods, Type Conversions, Comments, Input Processing and output.	04	07			
2.	<b>Decision Structures in Python</b> Conditional Blocks Using if, Else and Else If, Simple for Loops in Python, For Loop Using Ranges, String, List and Dictionaries Use of While Loops in Python, Loop Manipulation Using Pass, Continue, Break and Else	04	07			
3.	Array and Strings in Python Arrays, Basic Strings, Accessing Strings, Basic Operations, String Slicing, Testing, Searching and Manipulating Strings, Function and Methods.	03	08			
4.	<b>Dictionary, List, Tuples and Sets</b> Dictionaries, Accessing Values in Dictionaries, Working with Dictionaries, Properties, Functions and Methods. Sets, Accessing Values in Set, Working with Set Properties, Functions and Methods, Tuple, Accessing Tuples, Operations, Working, Functions and Methods. List, Accessing List, Operations, Working With Lists, Function and methods, two-dimensional lists.	05	10			
5.	<b>Functions, Modules and Packages in Python</b> Introduction to Functions, defining a Function, Calling a Function, Types of Functions, Function Arguments, Anonymous Functions, Global and Local Variables, Importing Module, Math Module, Random Module, Introduction to Packages: Numpy, Pandas, Matplotlib.	07	14			
	Section II					
Module No.	Content	Hours	Weightage in %			
6.	<b>Python Object Oriented Programming</b> OOP Concept of Class, Object and Instances, Constructor, Class,	08	16			

	Attributes, Methods, Using Properties to Control Attribute Access, and Destructors, Inheritance, Overloading Operators. Objects in Python: Creating Python Classes, Modules and Packages, Inheritance in Python, Polymorphism in Python.		
7.	<ul> <li>Files &amp; Regular Expression in Python</li> <li>Introduction to File Input and Output, Writing Data to a File, Reading</li> <li>Data from a File, Additional File Methods, Using Loops to Process Files,</li> <li>Processing Records, RE Module, Basic Patterns, Regular Expression</li> <li>Syntax, Regular Expression Object, Search Object, Findall method, Split</li> <li>method, Sub Method.</li> </ul>	05	15
8.	<b>Exception Handling in Python</b> Handling IO Exceptions, Working with Directories, Metadata, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions, Throwing Mechanism, Catching Mechanism	05	09
9.	<ul> <li>Building Desktop Application</li> <li>Exploring the Tkinter Library in Python, Creating basic Desktop application using Tkinter</li> </ul>	04	14
	TOTAL	45	100

#### List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction to Python (Introduction to IDLE, different data types, Input Output in	04
	Python, Operators, Operator precedence).	
2.	Manipulation of Strings.	04
3.	Implementation of Dictionaries, Sets in Python.	03
4.	Implementation of Tuples and Lists in Python.	03
5.	Working with decision structures in Python	04
6.	Working with functions and modules in Python	02
7.	Working with Object-oriented paradigms in Python	04
8.	Implementation of file handling in Python.	02
9.	Exception handling in Python	02
10.	Building desktop application of your own calculator in Python.	02
	TOTAL	30

# Text Book(s):

Title	Author/s	Publication
Python approach Programming: A modular	Sheetal Taneja, Naveen Kumar	Pearson

# **Reference Book(s):**

Title	Author(s)	Publication
Think Python: How to Think Like a	Allen Downey	Green Tea Press
Computer Scientist		
Python Cookbook	David Ascher, Alex Martelli	O Reilly Media
	Oreilly	

# Web Material Link(s):

- <u>https://www.tutorialspoint.com/python/</u>
- <u>https://www.w3schools.com/python/</u>
- <u>https://onlinecourses.nptel.ac.in/noc20\_cs83/preview</u>

# **Course Evaluation:**

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

# Practical:

- Continuous Evaluation consists of practical performance which should be evaluated out of 10 for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Exam.
- Viva-voce consists of 30 marks during End Semester Exam.

# Course Outcome(s):

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

SEIT1210	PYTHON FOR ENGINEERS
CO 1	Interpret the fundamental python syntax, semantics and fluent in the use of python
01	control flow statements.
CO 2	Determine the methods to create and manipulate python programs by utilizing the data
02	structures like lists, dictionaries, tuples and sets.
CO 2	Articulate the object-oriented programming concepts such as encapsulation, inheritance
0.03	and polymorphism as used in python.
CO 4	Identify the commonly used operations involving file systems and regular expressions.

#### Mapping of CO with PO

<b>SEIT1210</b>	P01	PO2	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	1	1	2	1	1				3	2	1	3
CO 2	2	2	2	2	1				3	2	1	3
CO 3	2	2	2	2	1				3	2	1	3
CO 4	2	2	2	2	1				3	2	1	3
CO 5	1	1	2	1	1				3	2	1	3

#### Mapping of CO with PSO

SEIT1210	PSO1	PSO2	PSO3
CO 1	2		2
CO 2	2		2
CO 3	2		2
CO 4	2		2
CO 5	2		2

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module	Content	RBT Level
No		
1.	Introduction to Python	1,2,4
2.	Decision Structures in Python	1,2,3
3.	Array and Strings in Python	1,2,3
4.	Dictionary, List, Tuples and Sets	2,3,4
5.	Functions, Modules and Packages in Python	2,3,4
6.	Python Object Oriented Programming	3,4,6

7.	Files & Regular Expression in Python	3,4.6
8.	Exception Handling in Python	3,4,5
9.	Building Desktop Application	2,3,4

# **Department of Science and Humanities**

Course Code: SESH1130 Course Name: Experimental Physics Prerequisite Course(s): --

# **Teaching & Examination Scheme:**

_										
Teaching Scheme (Hours/Week)				Exan	nination	۱ Scheme	e (Mark	s)		
Theory	Practical	Tutorial	Crodit	The	ory	Prac	tical	Tuto	orial	Total
THEOTY	Flattical	Tutoriai	Cleuit	CE	ESE	CE	ESE	CE	ESE	Total
03	02	00	04	40	60	40	60	00	00	200
012 0										

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- Prepare students for career in engineering where physics principles can be applied for the advancement of technology.
- Think in core concept of engineering application by studying various topics involved in branch specific application.

	Section I					
Module No.	Content	Hours	Weightage in %			
1	<b>QUANTUM PHYSICS</b> (Prerequisites: Dual nature of radiation, Photoelectric effect Matter waves, wave nature of particles, de-Broglie relation, Davisson-Germer experiment). Introduction; De Broglie hypothesis of matter waves; Properties of matter waves; Phase velocity and group velocity and their relation; Heisenberg uncertainty principle; non-existence of electron in nucleus; Wave function; Physical interpretation of wave function; Schrodinger's time dependent wave equation; time independent wave equation; Quantum Computing (overview).	07	16			
2	Acoustic and Ultrasonic(Prerequisites: Sound, propagation of sound, concept of frequency and wave length).Acoustic – Introduction, Classification and Characterization of Sound, Sabine's formula for reverberation (without derivation), Absorption Coefficients, Sound Absorbing Materials, factors affecting the acoustics of buildings and remedies, Sound Insulation.Ultrasonic – Introduction, Properties of Ultrasonic, Generation of Ultrasonic sound: Piezoelectric & Magnetostriction effect, Applications of Ultrasonic.	07	16			
3	LASER AND FIBRE OPTICS (Prerequisites: Absorption, recombination, Valance and conduction bands, refractive index of a material, Snell's law) LASER – Introduction, Characteristics, Absorption, Spontaneous and stimulated emission; metastable state, population inversion, Pumping mechanism, components of LASER; Nd:YAG Laser, Applications of LASER.	08	18			

FIBRE OPTICS – Introduction, Optical Fiber construction, working	
principle and types, Numerical Aperture, Acceptance angle and	
Attenuation, Fiber optic communication system, Applications of	
Optical Fiber.	

	Section II						
Module No.	Content	Hours	Weightage in %				
4	NANOSCIENCE AND NANOTECHNOLOGY (Prerequisites: Nano scale and structures, general purpose of nano technology, method of formation of nano structure, fullerenes, carbon nanotubes). Nanomaterials : Properties (Physical, Mechanical, Optical, Electrical, Magnetic); Surface to Volume Ratio; Synthesis of Nanomaterials: Bottom up and Top down technique; Methods to synthesize nanomaterials: PVD & Sol-gel, Applications.	06	14				
5	SUPERCONDUCTORS AND SUPERCAPACITORS (Prerequisites: Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current, Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical resistivity and conductivity temperature dependence of resistance). Superconductors: Introduction, Critical temperature, Properties of superconductors, Type of superconductors: Type I and Type II and high Tc superconductors, Applications: Magnets, Josephson effect, SQUID, Maglev, other. Supercapacitors: Principle, construction, materials and applications, comparison with capacitor and batteries : Energy density, Power density.	08	18				
6	<b>SEMICONDUCTOR PHYSICS AND TECHNOLOGY</b> (Prerequisites: Intrinsic and extrinsic semiconductors, Energy bands in conductors, semiconductors and insulators, Semiconductor diode, I-V characteristics in forward and reverse bias) Direct & indirect band gap semiconductor; Fermi level; Fermi energy level in intrinsic & extrinsic semiconductors; effect of impurity concentration and temperature on fermi level; mobility, current density; Hall Effect; Fermi Level diagram for p-n junction (unbiased, forward bias, reverse bias); Applications of semiconductors: LED, Zener diode, Photovoltaic cell.	09	18				

# List of Practical:

Sr. No.	Name of Practical	Hours
1.	Analysis of errors.	04
2.	To measure diameter of a small spherical body using Vernier calipers and hence find its volume.	04
3.	To measure the diameter of given object using micrometer screw gauge.	04
4.	Verify ohm's law using ammeter and voltmeter.	04
5.	To study the series and parallel connections of resistors.	02
6.	To study the series and parallel connections of capacitors.	02
7.	I-V characteristics of Light Emitting diode (LED).	02
8.	I-V characteristics of Zener diode.	04
9.	To determine Numerical aperture and acceptance angle of an optical fiber.	04

# Text Book(s):

Title	Author/s	Publication
Concept of the Modern Physics	A. Beiser	Tata McGraw-Hill Education
Basic electrical engineering	Kothari and Nagrath	Tata McGraw-Hill Education
Quantum Mechanics	P.M. Mathew, K. Venkatesan	Tata McGraw-Hill Education
Waves and Acoustics	Pradipkumar Chakrabarti	New Central Book Agency
	Satyabrata Chawdhary	
Lasers and Nonlinear Optics	G.D. Baruah	Pragati Prakashan
Engineering Physics	G Vijayakumari	Vikas Publishing house PVT LTD
Basic Electronics for Scientists	Dennis L. Eggleston	Cambridge University Press
and Engineers		

# Web Material Link(s):

• http:/nptel.ac.in/course.php

# **Course Evaluation:**

# Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

# Practical:

- Continuous Evaluation consists of Performance and regular manual writing, checking of the practical throughout the semester.
- Internal viva or practical performance consist of 20 Marks.
- Practical performance/test of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

# Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SESH1130	EXPERIMENTAL PHYSICS
CO 1	Understand the framework of quantum mechanics and apply the knowledge of basic
	quantum mechanics to construct one dimensional Schrodinger's wave equation.
CO 2	Classify the phenomenon of acoustics and ultrasonic in various engineering field and
	apply it for various engineering and medical fields.
CO 3	Describe the laser and articulate the idea of optical fiber communications and apply the
	concepts of lasers and optical fiber communications in every possible sector.
CO 4	Interpret the concept of Nanotechnology and understand the synthesis and applications
	of Nanomaterials from technological prospect. Discover the types and properties of
	Superconductors. Relate the behavior of superconductors at high temperatures
CO 5	Distinguish pure, impure semiconductors and characteristics of semiconductor devices.
	Thus, will be able to use basic concepts to analyze and design a wide range of
	semiconductor devices.

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

<b>Module No</b>	Content	<b>RBT Level</b>

1	Quantum Physics	2
2	Acoustic and Ultrasonic	3
3	Laser and Fibre Optics	2,3
4	Nanoscience and Nanotechnology	2,3,6
5	Superconductors and Supercapacitors	1, 2,3
6	Semiconductor Physics and Technology	1,6

# **Department of Science & Humanities**

Course Code: SESH1120

Course Name: Linear Algebra

Prerequisite Course/s: -- Algebra, Geometry, Trigonometry & Pre-Calculus till 12th Standard level

# **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)					E	xaminat	ion Sche	me (Mar	·ks)	
Theory	Practical	Tutorial	Credit	Theory		Theory Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	-	02	05	40	60	-	-	100	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- Analyses and solve system of linear equations and understand characteristics of Matrices.
- Learn about and work with vector space, linear transformation and inner product space.
- Apply concepts of linear algebra for solving science and engineering problems.
- Introduce the concept of improper integral and Beta-Gamma Function.

	Section I		
Module	Content	Hours	Weightage
No.			in %
	Matrix Algebra		
1	Elementary Row and Column operations, Inverse of matrix, Rank of	12	20
	matrix, System of Linear Equations, Characteristic Equation, Eigen	12	50
	values and Eigen vector, Diagonalization, Cayley Hamilton Theorem.		
	Vector Space		
2	Concept of vector space, Subspace, Linear Combination, Linear	11	20
	Dependence and Independence, Span, Basis and Dimension, Row	11	20
	Space, Column Space and Null Space, Rank and Nullity.		
	Section II		
Module	Content	Hours	Weightage
No.			in %
	Linear Transformation		
3	Introduction of Linear Transformation, Kernal and Range, Rank and	00	20
5	Nullity, Inverse of Linear Transformation, Rank Nullity Theorem,	0,	20
	Composition of Linear Maps.		
	Inner Product Space		
4	Inner Product, Angle and Orthogonality, Orthogonal projection, Gram-	08	20
	Schmidt process and QR Decomposition, least square decomposition.		
5	Beta and Gamma function	05	10
	Improper Integrals, Convergence, Properties of Beta and Gamma		
	Function, Duplication Formula (without proof)	45	100
	TOTAL	45	100

# List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	Matrix Algebra-1	04
2.	Matrix Algebra-2	02
3.	Vector Space-1	04
4.	Vector Space-2	02
5.	Linear Transformation-1	04
6.	Linear Transformation-2	02
7.	Inner Product Space-1	04
8.	Inner Product Space-2	02
9.	Beta and Gamma function-1	04
10.	Beta and Gamma function-2	02
	TOTAL	30

# Text Book(s):

Title	Author/s	Publication
Thomas' Calculus	George B. Thomas, Maurice D. Weir and Joel Hass	Pearson
Elementary Linear Algebra	Howard Anton and Chrish Rorres	Wiley

# **Reference Book(s):**

Title	Author(s)	Publication
Advanced Engineering Mathematics	E Kreyszig	John Wiley & Sons
A textbook of Engineering Mathematics	N P Bali and Manish Goyal	Laxmi
Higher Engineering Mathematics	B S Grewal	Khanna
Engineering Mathematics for First Year	T Veerarajan	Tata Mc Graw Hill
Engineering Mathematics-1 (Calculus)	H. K. Dass and Dr. Rama Verma	S. Chand

# **Course Evaluation:**

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

# Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 50 marks.
- Continuous Evaluation consists of self-performance assignment to 20 marks.
- Internal Viva consists of 30 marks.

# Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SESH1120	LINEAR ALGEBRA & CALCULUS
CO 1	Evaluate linear system using matrices and the knowledge of eigenvalues and
01	eigenvectors for matrix diagonalization
CO 2	Determine the basis and dimension of vector spaces and subspaces.
CO 3	Discuss the matrix representation of a linear transformation given bases of the relevant
0.05	vector space.

CO 4	Apply vectors, inner products, and linear transformations to real world situations.
CO 5	Classify gamma, beta functions & their relation which is helpful to evaluate some
	definite integral arising in various branch of engineering.

# Mapping of CO with PO

SESH1120	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	3	3	1	1								3
CO 2	3	2	1									2
CO 3	2	2	1									3
CO 4	2	2	1	1								1
CO 5	2	1	1									1

# Mapping of CO with PSO

SESH1120	PS01	PSO2	PSO3
CO 1	3	2	
CO 2	1	1	
CO 3	2	2	
CO 4	2	2	
CO 5			

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Matrix Algebra	1, 2, 3, 4, 5, 6
2	Vector Space	1, 2, 3, 4, 6
3	Linear Transformation	1, 2, 3, 4, 6
4	Inner Product Space	1, 2, 3, 4, 5, 6
5	Beta and Gamma Function	1, 2, 3, 4, 5

# **Department of Civil Engineering**

Course Code: SECV1210 Course Name: Basics of Civil Engineering Prerequisite Course/s: -

### **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)				Ех	kaminati	on Scher	ne (Marl	ks)					
	Theory	Dractical	Tratavial Cradit		Tutorial Cradit		The	eory	Prac	ctical	Tut	orial	Total
	Theory	Practical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total		
	3	0	2	5	40	60	00	00	100	0	200		

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective of the Course:**

To help learners to

- Understand components of building, building terminology and construction materials.
- Understand building layout plan.
- Understand latest trends in civil engineering.
- Understand importance of various construction equipment.

	Section I							
Module No.	Content	Hours	Weightage in %					
1.	<b>CIVIL ENGINEERING: AN OVERVIEW</b> Introduction, Branches, Scope, Impact, Role of Civil Engineer, Unit of measurement, Unit conversion (Length, Area, Volume).	04	10					
2.	<b>INTRODUCTION TO CIVIL ENGINEERING MATERIALS:</b> List of materials, Details (types, properties, uses) of materials: Cement, Aggregate, Brick, Steel, Concrete, Stone, Soil, Mortar, Timber, Plastic, Epoxy, Flyash, Steel slag, Copper slag, Bitumen, Optical fiber, Pipe, Wire, Cable, Smart material, Basic hand fill tests.	08	12					
3.	<b>BUILDING CONSTRUCTION:</b> Types of building, Components of building, Type of foundation and importance, Types of brick bonds, Principle of planning, Typical building layout, Symbols used in electrical layout, Symbols used for water supply, plumbing and sanitation. Nominal dimensions for door, window and furniture	10	20					
	Section II							
Module	Content	Hours	Weightage					
4.	<b>INTRODUCTION TO TOWN PLANNING:</b> 5Principles of town planning, Necessity of town planning, Origin of town, Growth of town, Land use, Principles and objects of zoning, Advantages of zoning, Low cost housing, Prevention of slum, FSI.	04	10					
5.	<b>INTRODUCTION TO SURVEYING AND LEVELLING:</b> Introduction: Fundamental principles, Classification. Linear measurement: Instruments used, Chaining on plane ground, Offset, Ranging. Angular measurement: Compass-Instrument used, Meridian,	10	20					

	Bearing, Local attraction. Levelling: Instrument used, Terminology, Types of leveling, Methods of leveling. Modern tools: Introduction to theodolite, Total Station, GPS.		
6.	<b>CONSTRUCTION EQUIPMENT:</b> Types of equipment- Functions, Uses. Hauling equipment- Truck, Dumper, Trailer. Hoisting equipment- Pulley, Crane, Jack, Winch, Sheave block, Fork truck. Pneumatic equipment- Compressor. Conveying equipment- package, screw, flight/scrap, bucket, belt conveyor. Drill, Tractor, Ripper, Rim pull, Dredger, Drag line, Power shovel, JCB, Hoe.	04	10
7.	<b>RECENT TRENDS IN CIVIL ENGINEERING:</b> Mass Transportation, Rapid Transportation, Smart City, Sky scarper, Dams, Rain Water harvesting, Batch mix plant, Ready Mix Concrete plant, Green building, Earth quake resisting building.	05	10

#### List of Tutorial :

Sr. No	Name of Practical	Hours
1.	Unit conversation Exercise.	02
2.	Chart preparation of various materials.	02
3.	Different types of brick bonds.	04
4.	Layout of residential building.	02
5.	Introduction Linear and angular measurements	02
6.	Introduction to Theodolite	04
7.	Introduction to Dumpy level.	02
8.	Introduction to total station.	04
9.	Videosshowing working of construction Equipments.	04
10.	Presentation on various topics as in module 7 about recent trends.	04
	TOTAL	30

# Text Book(s):

Title	Author/s	Publication
Elements of civil engineering	Anurag A. Kandya	Charotar Publication
Basic Civil Engineering	S. Ramamrutham	Dhanpatrai Publication

# **Reference Book(s):**

Title	Author/s	Publication
Elements of civil engineering	Dr. R. K. Jain and Dr. P. P.	McGraw Hill Education
	Lodha	
Basics of civil engineering	S.S. Bhavikatti	New age international
		Publishers

# Web Material Links:

- <u>http://nptel.ac.in/courses/105107122/</u>
- http://nptel.ac.in/courses/105107157/
- http://nptel.ac.in/courses/105101087/
- <u>http://nptel.ac.in/courses/105104100/</u>

- Continuous evaluation consists of two tests each of 15 marks and 1 hour of duration.
- Submission of assignment which consists of solving 20 numerical and it carried 10 marks of evaluation.
- End semester examination will consist of 60 marks exam.

# Tutorial:

- Continuous Evaluation consists of performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 100 marks.

# Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV1210	BASICS OF CIVIL ENGINEERING
CO 1	Understand the basics of civil engineering, including its branches, scope, roles, and unit
	conversions.
CO 2	Identify and explain the properties, types, and uses of various civil engineering
	materials.
CO 3	Analyze and apply principles of building construction, including building components,
	foundations, and planning.
CO 4	Demonstrate knowledge of surveying, levelling, modern tools, and recent trends in civil
	engineering.

# Mapping of CO with PO

SECV1210	P01	PO2	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	3	2	1			2	2					1
CO 2	3	3	2	1		1	2					
CO 3	3	2	3			3	3		1		1	
CO 4	3	2	1		3	2	3					3

#### Mapping of CO with PSO

SECV1210	PSO1	PSO2	PSO3
CO 1	2	2	2
CO 2	2	2	2
CO 3	3	2	2
CO 4	3	2	2

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Civil engineering: An overview	1, 2, 3
2	Introduction to civil engineering materials	1, 2
3	Building construction	1, 2
4	Introduction to surveying and levelling	1, 2
5	Introduction to town planning	1, 2, 3
6	Construction equipment	1, 2
7	Recent trends in civil engineering	1, 2,4

# **Department of Computer Engineering**

Course Code: SECE1210 Course Name: Programming with C Essentials Prerequisite Course(s): --

#### **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)				Ех	kaminati	on Scher	ne (Marl	ks)		
Theory	Dractical	Tutorial Cradi		The	eory	Prac	ctical	Tut	orial	Total
Theory	Plactical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total
3	2	0	4	40	60	40	60	0	0	200

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- understand the basic components of a computer system.
- identify an appropriate approach to computational problems.
- develop logic building and problem-solving skills.

	Section I								
Module No.	Content	Hours	Weightage in %						
1.	<b>Introduction to Computers Programming:</b> Introduction to programs, its significance, classification of programming language, Selection of a programming language, Flow Charts and Algorithms.	04	10						
2.	Introduction to Constants, Variables and Data Types: Features of C Language, the Structure of C Program, Types of Errors, Debugging, Tracing the Execution of the Program, Watching Variables Values in Memory. Character Set, C Tokens, Keyword and Identifiers, Constants and Variables, Data Types - Declaration and Initialization, User Define Type Declarations - Typedef, Enum, Basic Input, and Output Operations, Symbolic Constants, Overflow and Underflow of Data.	07	15						
3.	<b>Operators, Expressions, and Managing I/O Operations:</b> Introduction to Operators and its Types, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associatively. Introduction to Reading a Character, Writing a Character, Formatted Input and Output.	05	10						
4.	<b>Conditional Statements:</b> Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and go-to statements, Ternary (?:) Operator. Looping: The while Statement, The Break Statement & The Do. While loop, The FOR loop, Jump within loops - Programs.	06	15						
	Section II		_						
Module No.	Content	Hours	Weightage in %						
5.	Arrays: Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays.	06	15						
6.	Strings: Declaring and Initializing String Variables, Arithmetic Operations on	05	12						

	Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions.		
7.	<b>User-Defined Functions:</b> Concepts of User-defined Functions, Prototypes, function Definition, Parameters, Parameter Passing, Calling a Function, Recursive Function.	06	13
8.	<b>Pointers:</b> Introduction to Pointers, Declaration and initialization of pointers, Pointer to pointer, pointer and array, pointer to array, array to pointer, function returning pointer.	06	10
	TOTAL	45	100

# List of Practical:

Sr. No.	Name of Practical	Hours
1.	Draw Flow Chart and write algorithm for at least five problems.	02
2.	Introduction to C programming environment, compiler, Linker, loader, and editor.	02
3.	Write programs to implement basic elements of C programming (different input functions, different output functions, different data types, and different operators)	04
4.	Write programs to implement control structures (if statement, if-else statement, nested if-else statement, switch statement, break statement, goto statement)	04
5.	Write programs to implement looping constructs (for loop, while loop, do-while and nested for loop)	04
6.	Write programs to implement arrays. (1-D array, and 2-D array)	04
7.	Write programs to implement strings. (input, output, different string inbuilt functions)	02
8.	Write programs to implement user-defined functions. (function with/without return type, function with/without argument, function and array)	04
9.	Write programs to implement recursive function.	02
10.	Write programs to implement pointers.	02
	TOTAL	30

# Text Book(s):

Title	Author/s	Publication
Programming in ANSI C	E. Balagurusamy	Tata McGraw Hill
Introduction to Computer Science	ITL Education Solutions Limited	Pearson Education

# **Reference Book(s):**

Title	Author(s)	Publication
Programming in C	Ashok Kamthane	Pearson
Let Us C	Yashavant P. Kanetkar	Tata McGraw Hill
Introduction to C Programming	ReemaThareja	Oxford Higher Education
Programming with C	Byron Gottfried	Tata McGraw Hill

# Web Material Link(s):

- <u>http://www.digimat.in/nptel/courses/video/106104128/L01.html</u>
- <u>https://www.youtube.com/watch?v=3QiItmIWmOM</u>

# **Course Evaluation:**

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.

• End Semester Examination consists of 60 marks.

# Practical:

- Continuous Evaluation consists of practical performance which should be evaluated out of 10 for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Exam.
- Viva-voce consists of 30 marks during End Semester Exam.

# **Course Outcome(s)**:

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

SECE1210	PROGRAMMING WITH C ESSENTIALS
CO 1	Observe and interpret the concepts for data representation, algorithms and coding
01	methods in computer system.
CO 2	Immediately analyze the syntax and semantics of the "c" language and apply in program.
CO 3	Manage the less memory usage while developing the program.
CO 4	Classify the types of errors occur while running the program.
COF	Develop and utilize user-defined functions, arrays, strings and pointers in C for efficient
0.05	data manipulation and code modularity.

# Mapping of CO with PO

SECE1210	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	3	3	1	1								1
CO 2	3	2	1									1
CO 3	3	2	1	1								
CO 4	3	2	1									1
CO 5	3	3	1		1							1

# Mapping of CO with PSO

SECE1210	PSO1	PSO2	PSO3
CO 1	3		
CO 2	1	1	
CO 3	1	2	
CO 4	2	1	
CO 5	2	2	

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module	Content	RBT Level
No		
1.	Introduction to Computers Programming:	1,2
2.	Introduction to C, Constants, Variables and Data	1,2,3
	Types	
3.	Operators, Expressions, and Managing I/O	3,4
	Operations	
4.	Conditional Statements	2,3,4
5.	Arrays	2,3,5
6.	Strings	2,3
7.	User-Defined Functions	2,3,4,6

Q Deintora 224E	
8.         Pointers         2,5,4,5	

# **Department of Science and Humanities**

Course Code: SEEC1210 Course Name: Basics of Electrical and Electronics Prerequisite Course(s): --

# **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)				Exan	nination	۱ Scheme	e (Mark	s)		
Theory	Practical	Tutorial	Crodit	The	ory	Prac	tical	Tuto	orial	Total
Theory	Flactical	Tutorial	Cleuit	CE	ESE	CE	ESE	CE	ESE	Total
03	02	00	04	40	60	40	60	00	00	200
an a			-							

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- Understand fundamental concepts of electrical related to Voltage, Current etc. and principles of circuit analysis.
- Explore electrical components, learn measurement and instrumentation along with elementary understanding of electronics.

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c ...

Section I							
Module No.	Content	Hours	Weightage in %				
1	<b>Basic Introduction to Electricity and Magnetism</b> Concept of Charge, Coulomb's law, Electric Field, Intensity of electric field, Electric lines of force, Properties of electric lines of force, Electric flux, Flux density, Potential Difference and Current, Concept of Magnetic field, Coulomb's law of magnetic force, Magnetic Lines of Force, Magnetic flux.	11	24				
2	<b>DC Circuits and Electromagnetism</b> Electrical circuit elements (R, L and C): Resistor, capacitor, Inductor, Voltage and Current sources, Ohm's law, effect of Temperature on resistance, temperature coefficient, Series and parallel combinations of Resistors and capacitors, Kirchoff's current and voltage laws, Thevenin and Norton Theorems. Ampere's law, Lenz and Faraday's laws for electromagnetic induction, Self inductance, Mutual inductance. Examples	12	26				
	Section II						
Module No.	Content	Hours	Weightage in %				
1	AC Circuits Representation of sinusoidal waveforms, peak and RMS values, Phasor representation of AC quantities, real power, reactive power, apparent power, power factor, Three phase balanced circuits, voltage and current relations in star and delta connections, Power measurement in three phase circuits. Examples	11	25				
2	<b>Electronics</b> Classification of Solids: Energy levels in solids, Semiconductors, Intrinsic and Extrinsic Semiconductor, N-type & P-type	11	25				

semiconductors, P-N junction diode, Characteristics of P-N junction	
diode, Types of Diodes: Photo diode, Light Emitting Diode, Solar cell,	
PIN diode, Varactor diode, Zener diode, Advantages of Semiconductor	
Devices.	

#### List of Practical:

Sr. No.	Name of Practical	Hours
1.	To understand various electronic devices/components.	04
2.	To understand various tools (devices and equipments) used in electrical and electronic circuits for measurements.	04
3.	To study cathode ray oscilloscope and to understand how to take measurement, time period and frequency.	02
4.	To verify ohm's law using ammeter and voltmeter.	02
5.	To study the series and parallel connections of resistors.	04
6.	To study the series and parallel connections of capacitors.	04
7.	To verify Kirchoff's Current and Voltage Law.	02
8.	To study I-V characteristics of Light Emitting diode (LED).	02
9.	To study I-V characteristics of Zener diode.	02
10.	To understand Faraday's law of electromagnetic induction.	04
		30

#### Text Book(s):

Title	Author/s	Publication
Basic electrical engineering	T.N. Nagsarkar and M.S. Sukhija	Oxford University Press, 3 <sup>rd</sup> edition.
Basic electrical engineering	D.P. Kothari and I.J. Nagrath	Tata McGraw-Hill Education, 2010
Fundamentals of Electrical	L. S. Bobrow	Oxford University Press, 2011
Engineering		
Electronic Principles	Albert Malvino & David J. Bates	McGraw-Hill Education, 7 <sup>th</sup> edition.
Electronic Devices and	David A. Bell	Oxford University Press, 5 <sup>th</sup> edition
Circuits		-

# Web Material Link(s):

- https://archive.nptel.ac.in/courses/108/105/108105112/
- https://archive.nptel.ac.in/courses/108/101/108101091/

# **Course Evaluation:**

# Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

# **Practical:**

- Continuous Evaluation consists of Performance and regular manual writing, checking of the practical throughout the semester consists 20 Marks.
- Internal viva or practical performance consist of 20 Marks.
- Practical performance/test of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

# Course Outcome(s):

SEEC1210	BASICS OF ELECTRICAL AND ELECTRONICS
CO 1	Understand basic concepts of electricity and magnetism.
CO 2	Understand and apply fundamental electrical laws and circuit theorems to electrical circuits.
CO 3	Analyze the sinusoidal waveform, single phase and three phase AC circuits.
CO 4	Distinguish pure, impure semiconductors and characteristics of semiconductor devices; will be able to analyze diodes and diode circuits.

# After the completion of the course, the following course outcomes will be able to:

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Basic Introduction to Electricity and Magnetism	1,2
2	DC Circuits and Electromagnetism	2,3,4,5
3	AC Circuits	2,3,4,5
4	Electronics	3,4,5

# **Department of Mechanical Engineering**

Course Code: SEME1220 Course Name: Engineering Workshop Prerequisite Course(s): --

#### **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)					Exa	aminatio	n Schem	e (Marks	;)	
Theory	Practical	Tutorial	Credit	Г	heory	Pr	actical	Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
-	02	-	02	-	-	40	60	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- learn about the safety measures required to be taken while using working in workshop.
- learn about how to select the appropriate tools required for specific operation.
- learn about different manufacturing technique for production out of the given raw material.
- understand applications of machine tools, hand tools, power tools and welding process.

#### List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction and Demonstration of Safety Norms. Different Measuring	02
	Instruments.	
2.	To Perform a Job of Fitting Shop.	06
3.	To Perform a Job of Carpentry Shop.	06
4.	To Perform a Job of Sheet Metal Shop.	06
5.	To Perform a Job of Black Smithy Shop.	04
6.	Introduction and Demonstration of Grinding & Hacksaw Cutting Machine.	02
7.	Introduction and Demonstration of Plumbing Shop & Welding Process.	04
	TOTAL	30

# Text Book(s):

Title	Author(s)	Publication
Elements of Workshop Technology Vol. I	Hajra Chaudhary S. K.	Media promoters & Publishers
Workshop Technology Vol. I and II	Raghuvanshi B.S.	Dhanpat Rai & Sons

#### **Reference Book(s):**

Title	Author(s)	Publication
Workshop Technology Vol. I	W.A.J. Chapman	Edward Donald Publication
Workshop Practices	H S Bawa	Tata McGraw-Hill
Basic Machine Shop Practice Vol. I, II	Tejwani V. K.	Tata McGraw-Hill

# Web Material Link(s):

• <u>http://nptel.ac.in/</u>course.php

# **Course Evaluation:**

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 10 for each practical/Tutorial and average of the same will be converted to 30 Marks.
- Internal Viva consists of 40 Marks.
- External Viva consists of 60 Marks

# **Course Outcome(s)**:

After the completion of the course, the following course outcomes will be able to:

SEME1220	ENGINEERING WORKSHOP
CO 1	Understand the various measuring instruments.
CO 2	Understand the safety norms required in the workshop.
CO 3	Understand the application of various tools required for different operations.
CO 4	Remember the process of manufacture from a given raw material.
CO 5	Explain various manufacturing processes in machine shop.

# Mapping of CO with PO

<b>SEME1220</b>	P01	PO2	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	2					2			2		1	2
CO 2						3		3	3		1	3
CO 3	2					2			1		1	3
CO 4	2								3		2	3
CO 5	2								3		2	3

#### Mapping of CO with PSO

SEME1220	PSO1	PSO2	PSO3
CO 1	2	3	2
CO 2			
CO 3	2	3	2
CO 4	3	3	3
CO 5	3	3	3

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Practical	Content	RBT Level
No		
1	Introduction and Demonstration of Safety Norms. Different Measuring	1, 2, 4
2	Instruments.	1, 2, 3
3	To Perform a Job of Fitting Shop.	1, 2, 3
4	To Perform a Job of Carpentry Shop.	2, 3, 4
5	To Perform a Job of Sheet Metal Shop.	2, 3, 4
6	To Perform a Job of Black Smithy Shop.	2, 3, 4
7	Introduction and Demonstration of Grinding & Hacksaw Cutting Machine.	2, 3, 4

# **Department of Computer Engineering**

Course Code: SECE1220 Course Name: Digital Proficiency Prerequisite Course(s): --

# **Teaching & Examination Scheme:**

Teaching Scheme (Hours/Week)				Ех	kaminati	on Scher	ne (Marl	ks)		
Theory	Dractical	Tutorial	Tutorial Cradit	Theory		Practical		Tutorial		Total
Theory	Plactical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total
3	0	0	3	40	60	0	0	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

# **Objective(s) of the Course:**

To help learners to

- provide foundational knowledge of digital tools and technologies.
- introduce the principles of digital communication, collaboration, and problem-solving.
- enhance awareness of emerging digital trends and their applications in engineering.

	Section I		
Module No.	Content	Hours	Weightage in %
1.	<b>Introduction to Digital Literacy</b> Overview of digital tools and their applications, Introduction to operating systems (Windows, Linux), Basics of file management and cloud storage solutions, Digital communication tools: Email, messaging platforms, and video conferencing tools (Zoom, Teams).	06	13
2.	Office Productivity Tools Word Processing: Document formatting, templates, and styles (MS Word/Google Docs). Presentation Tools: Slide design, animations (MS PowerPoint/Google Slides).	04	10
3.	<b>Data Handling and Analysis</b> Spreadsheets: Data entry, formulas, charts, pivot tables (MS Excel/Google Sheets). Introduction to data visualization tools (e.g., Tableau, Power BI, Google Data Studio). Applications of data analysis in engineering contexts. AI features in Excel and Google Sheets for predictive analysis.	07	15
4.	<b>Computational Problem-Solving</b> Introduction to algorithms and flowcharts. Solving simple engineering problems through programming. Applications of computational techniques in various engineering domains.	06	12
	Section II		
Module No.	Content	Hours	Weightage in %
5.	<b>Cybersecurity and Ethical Practices</b> Understanding cybersecurity principles, Awareness of phishing, malware, and secure passwords, Digital footprints and privacy concerns, Ethical use of technology and copyright considerations.	05	12
6.	<b>Introduction to AI Tools and Applications</b> Overview of AI, Machine Learning, and their applications in engineering. Practical use of AI tools: ChatGPT for content creation and brainstorming, Canva for design and visual communication, GitHub	07	15

	Copilot for coding assistance. Ethical considerations in AI usage.		
7.	<b>Emerging Technologies and Industry Trends</b> Overview of Industry 4.0 concepts: IoT, AI, Robotics, and Blockchain. Applications of emerging technologies in various engineering domains. Case studies: Smart cities, sustainable manufacturing, and automation. Preparing for future technological trends and job roles.	07	15
8.	<b>Capstone Project and Case Study</b> Group project: Solve a practical engineering problem using digital tools. Case study presentations on the application of digital and AI tools in real-world scenarios.	03	08
	TOTAL	45	100

# Text Book(s):

Title	Author/s	Publication
Digital Literacy for Dummies	Faithe Wempen	Wiley
Literacy in a Digital World: The	Lorraine Dagostino, Jennifer Bauer,	Rowman & Littlefield
Evolution and Development of	Michael Deasy, Ed.D., Kathleen Ryan	
Literacy Proficiency		

# **Reference Book(s):**

Title	Author(s)	Publication
Computer Fundamentals	P.K. Sinha and Priti Sinha	BPB Publications- 6th Edition
Microsoft Office 365: In Practice	Randy Nordell and Annette	McGraw Hill Education- Latest
	Easton	Edition
Ethics for the Information Age	Michael J. Quinn	Pearson Education- 8th
		Edition
Industry 4.0: Managing the Digital	Alp Ustundag and Emre	Springer
Transformation	Cevikcan	

# Web Material Link(s):

- <u>https://learn.microsoft.com/en-us/training/browse/</u>
- <u>https://www.ibm.com/think/topics/cybersecurity</u>
- <u>https://www.youtube.com/playlist?list=PLlKpQrBME6xLGL3Ty\_1Wbd3nTZ\_q\_OKFQ</u>

# **Course Evaluation:**

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

# **Course Outcome(s)**:

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

SECE1220	Digital Proficiency
CO 1	Demonstrate proficiency in using digital tools, operating systems, and cloud platforms
01	for effective communication and collaboration.
CO 2	Create, edit, and manage professional documents, presentations, and spreadsheets using
02	modern office productivity software.
CO 3	Analyze and visualize data using advanced spreadsheet features and data visualization
	tools to solve engineering problems.
CO 4	Identify cybersecurity risks, implement ethical practices, and safeguard digital assets in
	professional environments.
CO 5	Apply AI tools and understand emerging technologies like IoT and blockchain to address
	real-world engineering challenges.

# Mapping of CO with PO

<b>SECE1220</b>	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012
CO 1	3	3		1	3				2	3		1
CO 2	3	2			3					3		1
CO 3	3	2	1	3	3							1
CO 4	3	2				3		3				1
CO 5	3	3	1		3						3	1

# Mapping of CO with PSO

SECE1220	PSO1	PSO2	PSO3		
CO 1	3	3	1		
CO 2	2	2			
CO 3	3	2	1		
CO 4	2	3	1		
CO 5	3	2	3		

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module	Content	RBT Level
No		
1.	Introduction to Digital Literacy	1,2,3
2.	Office Productivity Tools	2,3,4
3.	Data Handling and Analysis	2,3,4,5
4.	Computational Problem-Solving	2,3
5.	Cybersecurity and Ethical Practices	1,2,3
6.	Introduction to AI Tools and Applications	1,2,3,5
7.	Emerging Technologies and Industry Trends	3,4,5
8.	Capstone Project and Case Study	2,3,5,6