



Savitribai Phule Shikshan Prasarak Mandal's  
**SKN SINHGAD COLLEGE OF ENGINEERING**

(Approved by AICTE & Affiliated to PAH Solapur University, Solapur)

Accredited with 'A+' Grade by NAAC

A/p- Korti, Tal- Pandharpur, Pin- 413304, Dist.- Solapur.

**First Year B. Tech.**

E-mail: [fy@sknscoe.ac.in](mailto:fy@sknscoe.ac.in), Website: <https://www.sknscoe.ac.in>

Ref: SKNSCOE/FY/

## COs of F. Y. B. Tech. (NEP-2020) w.e.f. 2023-24

### Subject: BSC-01 ENGINEERING PHYSICS

At the end of this course, student will be able to:

BSC-01.1	Understand the concepts of semiconductors to implement in Engineering field.
BSC-01.2	Analyze the structural properties of elemental solids.
BSC-01.3	Apply concepts of acoustics and ultrasonic in various Engineering instruments.
BSC-01.4	Implement diffraction and polarization phenomenon to design advanced optical instruments.
BSC-01.5	Understand the fundamentals, construction and working of Laser in order to apply this Technology in Engineering fields.
BSC-01.6	Understand the basics of optical fiber and Nanoscience to implement in Engineering.

### Subject: BSC-02 ENGINEERING CHEMISTRY

At the end of this course, student will be able to:

BSC-02.1	Analyse the water quality and interpret techniques for water purification.
BSC-02.2	Describe lubrication and properties of lubricants, select proper lubricant for specific machine.
BSC-02.3	Explain mechanism of the corrosion, select proper preventive methods of corrosion.
BSC-02.4	Recognize the fuel quality and understand the scope of alternate energy sources.
BSC-02.5	Interpret the chemical synthesis, properties of various polymers and their applications.
BSC-02.6	Describe various types of energy storage systems with their applications.



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**Subject: BSC-03 ENGINEERING MATHEMATICS-I**

At the end of this course, student will be able to:

BSC-03.1	Compute higher order derivative of standard functions.
BSC-03.2	Determine the power series expansion of a given function and evaluate limits.
BSC-03.3	Use matrices techniques for solving system simultaneous linear equations, eigen values and eigen vectors of the matrix.
BSC-03.4	Solve multivariable derivative of given functions.
BSC-03.5	Use multivariable derivative to estimate maxima and minima of multivariable function.
BSC-03.6	Compute velocity vector, gradient, divergence, curl and applications.

**Subject: ESC-01 BASICS OF CIVIL AND MECHANICAL ENGINEERING**

At the end of this course, student will be able to:

ESC-01.1	Describe the role of civil engineer in the development of the society and Relationship of civil engineering with other branches of engineering and technology.
ESC-01.2	Explain various elements of buildings, concepts of Green Buildings, transportation engineering, Remote sensing Techniques, GIS &GPS..
ESC-01.3	Explain various concepts and application of GIS ,GPS and Remote sensing Techniques..
ESC-01.4	Determine heat and work quantum during different thermodynamic processes and Identify power absorbing/producing devices.
ESC-01.5	Identify suitable power transmission system for different mechanical applications
ESC-01.6	Explain various machining/joining processes implemented in everyday life.



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**Subject: ESC-02 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

At the end of this course, student will be able to:

ESC-02.1	Apply the various simplification methods to analyze dc circuits.
ESC-02.2	Use the concept of electromagnetism to calculate the parameters of magnetic circuits and single-phase transformers.
ESC-02.3	Apply knowledge of ac fundamentals to analyze ac circuits.
ESC-02.4	Demonstrate the working, characteristics, and applications of diode.
ESC-02.5	Explain the working, characteristics, and applications of BJT
ESC-02.6	Perform arithmetic operations on a digital number system.

**Subject: ESC-03 ENGINEERING MECHANICS**

At the end of this course, student will be able to:

ESC-03.1	Apply fundamentals of Engineering Mechanics for analyzing effects of a system of forces acting on a rigid body.
ESC-03.2	Analyze various types of statically determinate pin jointed trusses.
ESC-03.3	Apply knowledge of Kinematics of rigid body motion to solve problems of bodies in motion.
ESC-03.4	Apply knowledge of Kinetics of rigid body motion to solve problems of bodies in motion.
ESC-03.5	Apply Work Energy methods and conservation of momentum principle for analyzing linear and rotational motion.
ESC-03.6	Locate centroid and center of Gravity and calculate moment of Inertia of plane lamina.



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**Subject: AEC-01 ABILITY ENHANCEMENT COURSE (AEC-01)**  
**COMMUNICATION SKILLS**

At the end of this course, student will be able to:

AEC-01.1	Understand English grammar and apply it in communication.
AEC-01.2	Prepare for competitive exams with focus on verbal ability.
AEC-01.3	Develop oral communication skills.
AEC-01.4	Enhance reading and comprehension skills.
AEC-01.5	Prepare for professional written communication.
AEC-01.6	Develop and enhance communication skills.

**Subject: CC-01 SPORTS & YOGA / NCC / NSS/UBA (LIBERAL LEARNING COURSE-I)**

At the end of this course, student will be able to:

CC-01.1	Understand the basic principles and practices of Physical Education & Sports.
CC-01.2	Understand and apply the concepts of Physical Education, Sports and Yoga with its various implications.
CC-01.3	Develop professionalism among students to conduct, organize & officiate, Physical Education and Sports events at schools, colleges and community.
CC-01.4	Understand and apply the knowledge of NSS/NCC in the social fabric system.
CC-01.5	Become free thinker, open communicator, knowledgeable citizens and respectable individuals.



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**Subject: SEC-01 WORKSHOP PRACTICE**

At the end of this course, student will be able to:

SEC-01.1	Identify various hardware and software components of a computer and compare between them.
SEC-01.2	Assemble a desktop from components supplied and Setup a working desktop system using a Raspberry Pi board.
SEC-01.3	Identify and use various electronic components and instruments and Develop basic electronic circuits on breadboards.
SEC-01.4	Demonstrate the use of an Arduino board using basic circuits.
SEC-01.5	Prepare different shaped metal work piece joints from the given metal blanks by selecting different tools and machines, Perform different types of welding of metal components.
SEC-01.6	Select different engineering tools required to perform, fitting, machining, welding and joining processes.

**Subject: BSC-04 ENGINEERING MATHEMATICS-II**

At the end of this course, student will be able to:

BSC-04.1	Find the solution of first order & first degree ordinary differential equations with its applications
BSC-04.2	Determine the convergence of sequences and infinite series.
BSC-04.3	Determine the differentiation of functions of complex variable that are used in various techniques dealing engineering problems.
BSC-04.4	Solve improper integrals using mathematical tools.
BSC-04.5	Sketch cartesian, polar and parametric curves.
BSC-04.6	Solve multiple integrals and use them to find area of curve and mass of lamina.



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**Subject: ESC-04 ENGINEERING GRAPHICS AND CAD**

At the end of this course, student will be able to:

ESC-04.1	Draw the projections of oblique lines and planes
ESC-04.2	Explain views of solids and their sectional surfaces.
ESC-04.3	Visualize and draw the orthogonal views.
ESC-04.4	Draft the machine components and related parts by using commercial drafting software.

**Subject: SEC-02 DATA ANALYSIS AND PROGRAMMING SKILLS**

At the end of this course, student will be able to:

SEC-02.1	Design the flowchart and algorithms for the given programming problem
SEC-02.2	Implement/Write Pseudo code using C Program by appropriately selecting the control and loop structure
SEC-02.3	Implement/Write Pseudo code using C Program using Arrays.
SEC-02.4	Implement/Write Pseudo code using C Program using Functions and pointers.
SEC-02.5	Implement/Write Pseudo code using C Program using Structures and Unions



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**Subject: CC-02 CO-CURRICULAR COURSE (CC-02)**

**PROFESSIONAL PERSONALITY DEVELOPMENT**

At the end of this course, student will be able to:

CO-01	Understand the concept of personality development and do the SWOC analysis.
CO-02	Participate effectively in group discussion.
CO-03	Perform effectively in personal interview.
CO-04	Prepare good quality presentation and deliver it effectively.
CO-05	Inculcate soft skills for professional success.
CO-06	Develop right approach for personal and professional success.

**Subject: IKS-01 INTRODUCTION TO INDIAN KNOWLEDGE SYSTEM**

At the end of this course, student will be able to:

IKS-01.1	Creating awareness amongst the youths about the true history and rich culture of the country;
IKS-01.2	Understanding the scientific value of the traditional knowledge of Bhārata;
IKS-01.3	Promoting the youths to do research in the various fields of Bhāratiya knowledge system;
IKS-01.4	Converting the Bhāratiya wisdom into the applied aspect of the modern scientific paradigm;
IKS-01.5	Adding career, professional and business opportunities to the youths.



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**FIRST YEAR B. TECH.**

Academic Year 2020-21

**ENGINEERING PHYSICS**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C011.1</b>	Describe the concepts of semiconducting material and crystal structure.
<b>C011.2</b>	Apply basic concepts of acoustics and ultrasonic in engineering field.
<b>C011.3</b>	Relate space, time, mass and energy equations.
<b>C011.4</b>	Express the concepts of diffraction, polarization and can relate them to day to day observable phenomena.
<b>C011.5</b>	Explain the fundamental concepts, advantages and applications of laser and optical fiber in the field of science, engineering and medical.
<b>C011.6</b>	Express the basic concepts of quantum mechanics and nanotechnology.





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**ENGINEERING CHEMISTRY**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C012.1</b>	Describe importance of quality of water and appropriate water treatment process.
<b>C012.2</b>	Recognize various types of corrosion & propose a suitable prevention technique.
<b>C012.3</b>	Describe various instrumental techniques.
<b>C012.4</b>	Identify and explain different engineering materials like metals, ceramics, fuels, lubricants, polymers for various engineering and day to day applications.
<b>C012.5</b>	Calculate hardness of water, concentration of unknown solution, calorific value of fuels, saponification & acid value of oils, molecular weight of polymers etc.
<b>C012.6</b>	Describe various types of chemical reactions and commonly used drug molecules.



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**ENGINEERING MATHEMATICS- I**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C112.1</b>	Compute higher order derivative of standard functions and verify Mean Value Theorems.
<b>C112.2</b>	Describe the power series expansion of a given function and evaluate limits
<b>C112.3</b>	Apply matrices techniques for solving system simultaneous linear equations, Eigenvalues and Eigen vectors of the matrix
<b>C112.4</b>	Evaluate Multivariable derivatives and can implement to estimate maxima and minima of multivariable function
<b>C112.5</b>	Compute velocity vector, gradient, divergence, curl and applications.



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**BASIC ELECTRICAL AND ELECTRONICS  
ENGINEERING**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C123.1</b>	Apply the various simplification methods to analyze dc circuits.
<b>C123.2</b>	Use the concept of magnetic circuits to calculate parameters of magnetic circuits and single-phase transformer.
<b>C123.3</b>	Apply knowledge of ac fundamentals and poly phase to analyze ac circuits.
<b>C123.4</b>	Explain working, characteristics and applications of diode and BJT.
<b>C123.5</b>	Select appropriate transducers to measure various physical parameters like distance, temperature etc.
<b>C123.6</b>	Perform arithmetic operations on digital number system.



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**ENGINEERING MECHANICS**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C114.1</b>	Apply fundamentals of Engineering Mechanics for analyzing effects of a system forces acting on a rigid body.
<b>C114.2</b>	Analyze various types of statically determinate beams, pin jointed trusses by analytical and graphical methods.
<b>C114.3</b>	Locate centroid, center of Gravity, and calculate moment of Inertia of plane lamina.
<b>C114.4</b>	Apply knowledge of Kinematics and Kinetics of rigid body motion to solve problems of bodies in motion.
<b>C114.5</b>	Use Work Energy methods for analyzing linear and rotational motion.



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**COMMUNICATION SKILLS**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C116.1</b>	Frame grammatically correct sentences for day-to-day Communication.
<b>C116.2</b>	Use numerous appropriate words and sentences in written communication.
<b>C116.3</b>	Demonstrate effective oral communication skills in various situations.
<b>C116.4</b>	Read, comprehend and answer the questions based on a passage.
<b>C116.5</b>	Draft letters, emails, write paragraphs and essays with appropriate content and context.
<b>C116.6</b>	Solve verbal ability questions in competitive exams



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**WORKSHOP PRACTICE**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C118.1</b>	Identify various hardware and software components of a computer and compare between them.
<b>C118.2</b>	Assemble a desktop from components supplied and Setup a working desktop system using a Raspberry Pi board.
<b>C118.3</b>	Identify and use various electronic components and instruments.
<b>C118.4</b>	Develop basic electronic circuits on breadboards.
<b>C118.5</b>	Demonstrate the use of an Arduino board using basic circuits.
<b>C118.6</b>	Prepare different shaped metalwork piece joints from the given metal blanks by selecting different tools and machines.
<b>C118.7</b>	Perform different types of welding of metal components.
<b>C118.8</b>	Select different engineering tools required to perform, fitting, machining, welding and joining processes.



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**ENGINEERING MATHEMATICS -II**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C122.1</b>	Solve first order ordinary differential equation and able to apply in different engineering applications
<b>C122.2</b>	Test divergence & convergence of infinite series
<b>C122.3</b>	Use the tools of differentiation of functions of a complex variable that are used in various techniques dealing engineering problems.
<b>C122.4</b>	Draw approximate shape of planer curve with justification.
<b>C122.5</b>	Evaluate improper and multiple integrals and their usage.



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**ENGINEERING GRAPHICS AND CAD**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C125.1</b>	Draw projection of lines and planes for engineering applications.
<b>C125.2</b>	Draw regular and sectional views of various types of solids.
<b>C125.3</b>	Draw the 2 D view (orthogonal views) given 3D drawing.
<b>C125.4</b>	Draw the development of the regular and truncated solids.
<b>C125.5</b>	Draft the 2-D drawing of machine components.





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**BASICS OF CIVIL AND MECHANICAL ENGINEERING**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C113.1</b>	Describe the role of civil engineer in the development of the society and Relationship of civil engineering with other branches of engineering and technology.
<b>C113.2</b>	Explain various elements of Environment & Water Resources Management, transportation engineering, buildings, concepts of Green Buildings, Remote sensing Techniques, GIS &GPS.
<b>C113.3</b>	Identify power producing/absorbing systems and related transmission systems.
<b>C113.4</b>	Explain various machining/joining processes implemented in everyday life.
<b>C113.5</b>	To determine heat and work quantum during different thermodynamic processes.



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**PROGRAMMING FOR PROBLEM SOLVING**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C124.1</b>	Design the flowcharts and algorithms for the given problem.
<b>C124.2</b>	Translate the algorithms into C programs and test & execute the programs.
<b>C124.3</b>	Implement C programs by appropriately selecting control and loop structures.
<b>C124.4</b>	Implement C programs using functions and pointers.
<b>C124.5</b>	Implement C programs using arrays, structure and unions and files.
<b>C124.6</b>	Develop small applications using C Programming concepts.



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**PROFESSIONAL COMMUNICATION**

<b>Co.No</b>	<b>Course Outcomes</b>
<b>C126.1</b>	Prepare good quality presentation and deliver it effectively.
<b>C126.2</b>	Participate effectively in group discussion
<b>C126.3</b>	Perform effectively in personal interview
<b>C126.4</b>	Prepare effective resume for job interviews
<b>C126.5</b>	Draft and write various reports professionally.