

**Course Book**

**VNIT**

**2023-2024**

विश्वेश्वरय्या राष्ट्रीय प्रौद्योगिकी संस्थान, नागपुर.  
VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR.

The course book provides comprehensive overview of the academic structure and regulations at VNIT. It contains the syllabi along with course objectives, outcomes and mapping to program outcome for the first year of all B. Tech. programs.

Additionally, it includes a convenient reference list of administrative staff, faculty mentors, faculty coordinators, student mentors, and section officers.

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# VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR



## Vision

To contribute effectively to the national and international endeavor of producing quality human resource of world class standard by developing sustainable technical education system to meet the changing technological needs of the country and the world, incorporating relevant social concerns and to build an environment to create and propagate innovative technologies for the economic development of the Nation.

## Mission

The mission of VNIT is to achieve high standards of excellence in generating and propagating knowledge in engineering and allied disciplines. VNIT is committed to providing an education that combines rigorous academics with joy of discovery. The Institute encourages its community to engage in a dialogue with society to be able to effectively contribute for the betterment of humankind.



## CREDITS SYSTEM

Education at the Institute is organized around semester-based credit system of study. The prominent feature of the credit system is a process of continuous evaluation of a student's performance and flexibility to allow a student to progress at an optimum pace suited to his/her ability, subject to fulfilling minimum requirement for continuation. A student's performance is measured by number of credits he/she has earned (i.e. completed satisfactorily). Based on the course credits and grades obtained by the student, Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA) is calculated. A minimum number of earned credits and minimum grade point average should be acquired in order to qualify for the award of graduate degree. Details are given in the Academic Rules and Regulation available on the Institute website [www.vnit.ac.in](http://www.vnit.ac.in)

### Credit requirement

A student is required to earn minimum of 170 credits in eight semesters. These credits are to be earned from different category of courses. There are mainly two category of courses a) Program core (PC), and b) Program Elective (PE). There are sub categories like, Basic Sciences (BS), Departmental Core (DC), Departmental Elective (DE), Humanities & Management (HM), Open Course (OC) and Audit Course (AU).

### Credit requirement for B. Tech. Program

Program Core (PC)		Program Elective (PE)	
Category	Credit	Category	Credit
Basic Science (BS)	18	Departmental Electives	33-48
Engineering Science (ES)	20	Humanities & Management	0-6
Humanities (HU)	05	Open Course	0-6
Departmental Core (DC)	79-82*		
	122-125		48-45
<b>Total requirement (PC +PE ) = 170 credits</b>			

\* The range in DC credits is for the Board of Studies to specify the requirement.



### Undergraduate Program Code, Title and Class Section

<b>Program Code</b>	<b>Program Title (B. Tech.)</b>	<b>Section</b>
CSE	Computer Science and Engineering	R
ECE	Electronics and Communication Engineering	S
EEE	Electronic and Electrical Engineering	T
MEC	Mechanical Engineering	U
CIV	Civil Engineering	W
CME	Chemical Engineering	X
MIN	Mining Engineering	Y
MME	Metallurgical and Materials Engineering	Z



**Courses to Register in First Year B. Tech.**  
(Sections CSE(R), ECE(S), EEE (T), \*MEC (U))

<b>I Semester</b>				
<b>Code</b>	<b>Course</b>	<b>Type</b>	<b>L-T-P</b>	<b>Credits</b>
CHL103 / *CHL102	Chemistry	BS	3-1-0	4
CHP103 / *CHP102	Chemistry Laboratory	BS	0-0-2	1
CSL101	Computer Programming	ES	3-0-2	4
EEL103 / *EEL102	Electrical Engineering	ES	3-1-0	4
EEP103 / *EEP102	Electrical Engineering Laboratory	ES	0-0-2	1
HUL102	Social Science	HM	2-0-0	2
MAL101	Mathematics I	BS	3-1-0	4
MEP102	Workshop	ES	0-0-4	2
SAA101	Health Information and Sports Part I	AU	0-0-2	0
			<b>Total Credits</b>	<b>22</b>

<b>II Semester</b>				
<b>Code</b>	<b>Course</b>	<b>Type</b>	<b>L-T-P</b>	<b>Credits</b>
AML152 / *AML153	Engineering Mechanics	ES	3-1-0	4
AMP152 / *AMP153	Engineering Mechanics Laboratory	ES	0-0-2	1
HUL101	Communication Skills	HM	2-0-2	3
MAL102	Mathematics II	BS	3-1-0	4
MEL103	Engineering Drawing	ES	3-0-0	3
MEP103	Engineering Drawing Practical	ES	0-0-2	1
PHL102	Physics	BS	3-1-0	4
PHP102	Physics Laboratory	BS	0-0-2	1
SAA102	Health Information and Sports Part II	AU	0-0-2	0
			<b>Total Credits</b>	<b>21</b>



**Courses to Register in First Year B. Tech.**  
(Sections CIV(W), **\*\*CME(X)**, MIN(Y), MME(Z))

<b>I Semester</b>				
<b>Code</b>	<b>Course</b>	<b>Type</b>	<b>L-T-P</b>	<b>Credits</b>
<b>**AML152/</b> AML153	Engineering Mechanics	ES	3-1-0	4
<b>**AMP152/</b> AMP153	Engineering Mechanics Laboratory	ES	0-0-2	1
HUL101	Communication Skills	HM	2-0-2	3
MAL101	Mathematics I	BS	3-1-0	4
MEL103	Engineering Drawing	ES	3-0-0	3
MEP103	Engineering Drawing Practical	ES	0-0-2	1
PHL103	Physics	BS	3-1-0	4
PHP103	Physics Laboratory	BS	0-0-2	1
SAA101	Health Information and Sports Part I	AU	0-0-2	0
			<b>Total Credits</b>	<b>21</b>

<b>II Semester</b>				
<b>Code</b>	<b>Course</b>	<b>Type</b>	<b>L-T-P</b>	<b>Credits</b>
CHL102	Chemistry	BS	3-1-0	4
CHP102	Chemistry Laboratory	BS	0-0-2	1
CSL101	Computer Programming	ES	3-0-2	4
EEL102	Electrical Engineering	ES	3-1-0	4
EEP102	Electrical Engineering Laboratory	ES	0-0-2	1
HUL102	Social Science	HM	2-0-0	2
MAL102	Mathematics II	BS	3-1-0	4
MEP102	Workshop	ES	0-0-4	2
SAA102	Health Information and Sports Part II	AU	0-0-2	0
			<b>Total Credits</b>	<b>22</b>



## Program Outcomes as defined by NBA (PO)

### Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** 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.
- 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 and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



**DETAILS OF COURSE CONTENTS****AML152 Engineering Mechanics**

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I, II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objectives:**

- The objective of the course is
- To expose the students to the basic concepts of mechanics such as force, equilibrium, moment etc. and to solve simple structures like beam and trusses.
- To introduce mechanical properties of materials, concepts of stress and strain etc.

**Course Outcomes (CO):**

- Students will be able to understand and analyse basic theory and principles of forces and their relationship to engineering applications.
- Students will be able to understand equilibrium of structures.
- Students will be able to draw internal forces for beams with various boundary conditions under given set of loading.
- Students will be able to understand the concepts of stresses and strains and their importance for engineering analysis and design.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	---	---	---	---	---	---	---	---
CO2	3	3	2	1	---	---	---	---	---	---	---	---
CO3	3	3	2	1	---	---	---	---	---	---	---	---
CO4	3	3	2	1	---	---	---	---	---	---	---	---

**Content of Course:****Force systems:**

Planar and Spatial Force System, Moment of a Force about a Point and about an Axis, Couple Moment

**Equilibrium:**

Free Body Diagram, Equilibrium of Statically Determinate Planar and Spatial Force Systems, Statically Determinate Truss System and their Analysis

**Centroid and Moment of inertia:**

First and Second Moment of Rectangular, Parallel Axis Theorem, Perpendicular Axis Theorem

**Internal forces in member:**

Determination of Variation of Axial Force (Axial Force Diagram), Shear Force (Shear Force Diagram), Bending Moment (Bending Moment Diagram)

**Concept of stress and strain:**

Normal and Shear Stress and Strain, Stress-Strain Curve, Hook's Law, Modulus of Elasticity, Poisson's Ratio, Modulus of Rigidity, Bulk Modulus, Shear Modulus, Thermal Stresses

**Determination of stress:**

Stress across a Rectangular Section due to bending moment

Stress across a Rectangular Section due to Shear Force

**Reference:**

1. R.C. Hibbler, Engineering Mechanics, Pearson Education, Asia Pvt Ltd.
2. F.P. Beer and E.R. Johnston, Vector Mechanics for Engineers: Statics and Dynamics, Tata McGraw-Hill
3. Irving H. Shames, Engineering Mechanics: Static and Dynamics, Pearson Education, Asia Pvt Ltd.
4. J.L. Meriam and L.G. Kraige, Engineering Mechanics, John Wiley and Sons.
5. Stephen Timoshenko, Strength of Materials, Part-1, CBS Publishers and Distributors, New Delhi
6. F.L. Singer and Andrew Pytel, Strength of Material, Harper and Row Publishers, New York.
7. E.P. Popov, Mechanics of Deformable Bodies, Prentice-Hall
8. F.P. Beer and E.R. Johnston, Mechanics of Materials, McGraw-Hill International

**AMP152 Engineering Mechanics Laboratory**

[0-0-2, Credit: 1]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I, II **Sem B Tech****Assessment:** Mid-term Eval 40% + End Term Eval 60%**Course Objective:**

- i. To expose the students to simple practical experiments based on fundamental concept of mechanics

**Course Outcomes (CO):** At the completion of this course,

1. The students will be able to see the experimental verification of certain laws of mechanics.
2. The students will be able to compare theoretical results with the experimental one.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	---	---	---	---	---	---	---	---	---	---
CO2	3	3	---	---	---	---	---	---	---	---	---	---
CO3	---	---	---	---	---	---	---	---	---	---	---	---
CO4	---	---	---	---	---	---	---	---	---	---	---	---

**Experiments: (Any 8 Experiments)**

1. Introduction to Engineering Mechanics
2. Proving the Law of Polygon of Forces
3. Verification of Lami's Theorem
4. Determination of forces in truss members by analytical and experimentally
5. Determination of Reactions of a Simply Supported Beam
6. Determination of Coefficient of Static Friction
7. Determination of centroid of Planar Figures



8. Tension Test on Metal Specimen
9. Bending Test on Wooden Beam
10. Shear test on metal specimen

**Reference Books:**

1. R. C. Hibbler, Engineering Mechanics: Statics, Pearson Education Asia Pvt Ltd. Singapore.
2. F. P. Beer and E.R. Johnston, Vector Mechanics for Engineers: Statics and Dynamics, Tata McGraw-Hill
3. Irving H. Shames, Engineering Mechanics: Static and Dynamics, Pearson Education, Asia Pvt Ltd.
4. J. L. Meriam and L.G. Kraige, Engineering Mechanics, John Wiley and Sons.
5. Stephen Timoshenko, Strength of Materials, Part-1, CBS Publishers and Distributors, New Delhi.
6. F. L. Singer and Andrew Pytel, Strength of Material, Harper and Row Publishers, New York.
7. E. P. Popov, Mechanics of deformable bodies, Prentice-Hall
8. F. P. Beer and E.R. Johnston, Mechanics of materials, McGraw-Hill International

**AML153 Engineering Mechanics**

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objectives:**

- i. The objective of the course is
- ii. To expose the students to the basic concepts of mechanics such as force, equilibrium, moment etc. and to solve simple structures like beam and trusses.
- iii. To introduce mechanical properties of materials, concepts of stress and strain, work and energy etc.

**Course Outcomes (CO):**

1. Students will be able to understand and analyse basic theory and principles of forces and their relationship to engineering applications.
2. Students will be able to determine first and second moment of area for various sections.
3. Students will be able to draw internal forces for beams with various boundary conditions under given set of loading.
4. Students will be able to understand the concepts of stresses and strains and their importance for engineering analysis and design.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	---	---	---	---	---	---	---	---
CO2	3	3	2	1	---	---	---	---	---	---	---	---
CO3	3	3	2	1	---	---	---	---	---	---	---	---
CO4	3	3	2	1	---	---	---	---	---	---	---	---



## Course Content:

### Force Systems and Equilibrium:

2-D Force System, Moment of a Force about a Point and about an Axis; Free Body Diagram, Reactions at Supports, Equilibrium of Planar Force System, Friction: inclined plane, wedge, ladder friction, Static Indeterminacy, Analysis of Statically Determinate Systems i.e., Beam and Trusses

### Properties of Area:

First and Second Moment of Areas, Parallel Axis Theorem, Perpendicular Axis Theorem

### Internal Forces in Member:

Determination of variation of Axial force (Axial Force Diagram), Shear Force (Shear Force Diagram), Bending Moment (Bending Moment Diagram)

### Concept of Stress and Strain:

Normal and Shear Stress and Strain, State of Stress at a Point, Stress Strain Curve, Hook's Law, Modulus of Elasticity, Poisson's Ratio, Modulus of Rigidity, Bulk Modulus, Simple Indeterminate Systems, Thermal Stresses, Shear Stress and Bending Stress for Rectangular Section

### Work and Energy:

Virtual Work and Potential Energy Principles, D'Alembert's Principle

### Reference:

1. R.C. Hibbler, Engineering Mechanics, Pearson Education, Asia Pvt Ltd.
2. F.P. Beer and E.R. Johnston, Vector Mechanics for Engineers: Statics and Dynamics, Tata McGraw-Hill
3. Irving H. Shames, Engineering Mechanics: Static and Dynamics, Pearson Education, Asia Pvt Ltd.
4. J.L. Meriam and L.G. Kraige, Engineering Mechanics, John Wiley and Sons.
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6. F.L. Singer and Andrew Pytel, Strength of Material, Harper and Row Publishers, New York.
7. E.P. Popov, Mechanics of Deformable Bodies, Prentice-Hall
8. F.P. Beer and E.R. Johnston, Mechanics of Materials, McGraw-Hill International
9. R. C. Hibbler, Engineering Mechanics: Statics and Dynamics, Pearson Education Asia Pvt Ltd. Singapore.
10. F.L. Singer, Engineering Mechanics Statics & Dynamics, Harper and Row Publishers, Singapore

**AMP153 Engineering Mechanics Laboratory**

[0-0-2, Credit: 1]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech

**Assessment:** Mid-term Eval 40% + End Term Eval 60%

### Course Objective:

- i. To expose the students to simple practical experiments based on fundamental concept of mechanics.

**Course Outcomes (CO):** At the completion of this course,

1. The students will be able to see the experimental verification of certain laws of mechanics.



- The students will be able to compare theoretical results with the experimental one.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	---	---	---	---	---	---	---	---	---	---
CO2	3	3	---	---	---	---	---	---	---	---	---	---
CO3	---	---	---	---	---	---	---	---	---	---	---	---
CO4	---	---	---	---	---	---	---	---	---	---	---	---

**Experiments: (Any 8 Experiments)**

- Introduction to Engineering Mechanics
- Proving the Law of Polygon of Forces
- Verification of Lami's Theorem
- Determination of forces in truss members by analytical and experimentally
- Determination of Reactions of a Simply Supported Beam
- Determination of Coefficient of Static Friction
- Determination of centroid of Planar Figures
- Tension Test on Metal Specimen
- Bending Test on Wooden Beam
- Shear test on metal specimen

**Reference Books:**

- R. C. Hibbler, Engineering Mechanics: Statics, Pearson Education Asia Pvt Ltd. Singapore.
- F. P. Beer and E.R. Johnston, Vector Mechanics for Engineers: Statics and Dynamics, Tata McGraw-Hill
- Irving H. Shames, Engineering Mechanics: Static and Dynamics, Pearson Education, Asia Pvt Ltd.
- J. L. Meriam and L.G. Kraige, Engineering Mechanics, John Wiley and Sons.
- Stephen Timoshenko, Strength of Materials, Part-1, CBS Publishers and Distributors, New Delhi.
- F. L. Singer and Andrew Pytel, Strength of Material, Harper and Row Publishers, New York.
- E. P. Popov, Mechanics of deformable bodies, Prentice-Hall
- F. P. Beer and E.R. Johnston, Mechanics of materials, McGraw-Hill International

**CHL102 Chemistry**

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objectives:**

- To present sound knowledge of chemistry fundamentals as a strong foundation for enriching students to understand the role of chemistry in the field of science and engineering.



- ii. To develop ability to understand, plan and implement various processes like corrosion control, catalytic cracking, water softening, including modern approaches.
- iii. To inculcate habit of scientific reasoning to do the task rationally.

**Course Outcomes (CO):**

1. Ability to explain the basic theories and principles of chemistry for engineering practices.
2. Exposure to chemical aspects of various kind of materials for industrial applications.
3. Ability to apply the chemical concepts to solve the industrial issues.
4. Ability to employ critical thinking and efficient numerical problem-solving skills.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	1	1	-	-	-	1
CO2	3	1	1	1	-	1	2	1	-	-	-	1
CO3	2	1	2	2	1	1	2	1	1	-	-	1
CO4	3	3	1	2	-	1	1	1	1	1	-	1
CO5	3	3	2	1	-	2	1	1	-	-	-	1

**Course Content:****1. Water Chemistry:**

Sources, conservation of water, impurities in water and their effects. WHO guideline and BIS guideline for drinking water. Chemistry involved in sedimentation, coagulation and sterilization. Softening of water, lime-soda, ion-exchange process and numerical problem. Boiler troubles, causes and effects, methods of prevention. (4 hours)

**2. Electrochemical Phenomenon, Corrosion and Battery Technology:**

Electrochemical and galvanic series, polarization, decomposition potential, over voltage. Theories of corrosion. Differential aeration theory. Factors influencing corrosion. Types of corrosion Control of corrosion: Design and material selection, anodic and cathodic protection, protective coatings, corrosion inhibitors.

Introduction types and properties of batteries: Primary cells, Secondary cells (Lithium-ion battery: Chemistry involved, Cathode materials, Anode materials, Electrolytes and Separators used. Reason why batteries explode) and Reserve cell (Water activated batteries, Electrolyte activated batteries, Gas activated batteries, Heat activated batteries), Fuel Cells, Solar cells

**3. Fuels and Lubricants:**

Fuels: Introduction and classification of fuels, solid fuels CV, proximate and ultimate analysis, carbonization. Liquid fuels, Knocking in I/C engine, Octane no, Cetane no., combustion problems. Lubricants: Mechanism of friction, Classification: solid semisolid, liquid with examples. Properties and applications of lubricants.

**4. Spectroscopy:**

Interaction of radiation with matter, Molecular/Atomic Spectroscopy: Principles and applications of optical (UV-Vis) spectroscopy, Atomic absorption spectroscopy, Flame photometry, vibrational (IR) spectroscopy and interpretation. Interaction of  $\alpha$ -,  $\beta$ - and  $\gamma$ -radiation with matter. (6 hours)

**5. Industrially relevant processes**

Skraup synthesis, Beckman reaction, Friedel-craft acylation, Suzuki reaction, Heck



reaction, Introduction to coordination chemistry, Chelate effect and applications.

Chemical methods of material synthesis: Chemistry in Sol-gel synthesis, co-precipitation technique, Pechini's method, emulsions, CVD, thin films, polymerization.

Topics in Chemistry of Metallurgical Analysis

### **6. Chemistry of Engineering Materials:**

Cement: Introduction, manufacturing and properties, Fly ash utilization;

Polymers: Structure property relationship of polymers - Characterization. Synthesis, properties and applications of industrial grade polymers [polyester, poly(ethylene terephthalate) (PET), silicone, nylon, polyurethane, isoprene and Bakelite]. Conducting polymers; Glass and Ceramics: Introduction, properties and applications;

Explosives: Introduction, Introduction to Analytical techniques: trace and bulk level, requisites, oxygen balance, Classification, properties and applications. Rocket propellants

### **7. Adsorption and catalysis:**

Physical adsorption, chemisorption, Freundlich's expression, Langmuir adsorption isotherm, BET isotherm, industrial applications of adsorption.

Heterogeneous catalysis: Materials' perspective in adsorption, ion conduction/exchange, gas separation, catalysts, sensors, pollution abatement, and sustainable energy applications.

### **Reference Books:**

1. S.S. Dara; A Text Book of Engineering Chemistry, 10th Eds.; S. Chand,2003.
2. Jain and Jain, Engineering Chemistry, 17th Eds; Dhanpat Rai publishing.
3. Fundamentals of Ceramics – by Michel Barsoum, McGrawHill.
4. Fuels Combustion and Furnaces, John Griswold, Mc-Graw Hill Book Company Inc.
5. Lubrication-A practical guide to lubricant selection by A.R. Lansdown. Pergamonpress,1982.,
6. P. W. Atkins and J dePaula;Atkin'sPhysicalChemistry,8th,9thand10thEds.,OxfordUniversity Press .
7. Kuriacose,J.C.,Rajaram,J.;ChemistryinEngineeringandTechnology(Vol.1&2);McGrawHill, 1984.
8. Barrow,M.Gordon;PhysicalChemistry(Fifthedition);McGraw-Hill,1992.
9. Shashi Chawla; A Text Book of Engineering Chemistry, Dhanpat Rai and Co publishing.
10. S. Glasstone, An Introduction to Electrochemistry

### **CHP102 Chemistry Laboratory**

[0-0-2, Credit: 1]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech

**Assessment:** Mid-term Eval 40% + End Term Eval 60%

### **Course Objective:**

- i. To develop skills and capabilities of students in applying knowledge of chemistry for solving real life problems. Provide thorough understanding of the subject as many experiments are based on theory course.

### **Course Outcomes (CO):**

1. Knows the proper procedures and regulations for safe handling and use of chemicals, and can follow the proper procedures and regulations for the safe handling when using chemicals.
2. Are able to design, carry out, record and analyze the results of chemical experiments. Are



skilled in problem solving, critical thinking and analytical reasoning.

3. Ability to use modern instrumentation for chemical analysis and measurements.
4. Are able to communicate the results of their work to chemists and non-chemists.

### Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1	2	2	1	1	1	-	1
CO2	3	2	2	3	1	1	2	2	2	1	1	-
CO3	2	1	2	3	1	1	-	1	-	1	-	1
CO4	1	1	1	1	1	-	1	1	1	2	1	1

### Course Content:

1. Water and waste water analysis: Determination of
  - i. Hardness
  - ii. Alkalinity
  - iii. Dissolved oxygen and free chlorine,
  - iv. Chloride, fluorides and COD,
  - v. Trace metal in water using Ion –selective electrodes, arsenic, lead, mercury.
2. Determination of capacity of ion exchange resin.
3. Analysis of ores and alloys
  - i. Determination of copper in brass
  - ii. Calcium in limestone and dolomite.
4. Demonstration experiments on instrumental methods of analysis
  - i. pH-metric and conductometric titration
  - ii. Colorimetric determination
  - iii. Turbidity by nephelometer
  - iv. Flame photometry
  - v. Flashpoint of lubricants
  - vi. Viscosity of lubricants
  - vii. Calorific value of solid fuels
  - viii. Proximate analysis of coal.
5. Chemical kinetics / Adsorption
  - i. Determination of rate constant
  - ii. Verify Freundlich Adsorption isotherm (study adsorption of acetic acid on activated charcoal)
6. Synthesis of paracetamol and aspirin, and its characterization.  
Fabrication of reserve batteries.

### CHL103 Chemistry

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech

**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

### Course Objective:

- i. To present sound knowledge of chemistry fundamentals as a strong foundation for enriching students to understand the role of chemistry in the field of science and engineering.





- ii. To develop ability to understand, plan and implement various processes for energy storage, synthesis and applications of nano-materials, opto-electronic materials, including modern approaches.
- iii. To inculcate habit of scientific reasoning to do the task rationally.

**Course Outcomes (CO):**

1. Ability to explain the basic theories and principles of chemistry for engineering practices.
2. Exposure to chemical aspects of various kind of materials for industrial applications.
3. Ability to apply the chemical concepts to solve the technological issues.
4. Ability to employ critical thinking and efficient numerical problem-solving skills.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	2	1	1	-	-	-	1
CO2	3	1	1	1	-	1	2	1	-	-	-	1
CO3	2	1	2	2	1	1	2	1	1	-	-	1
CO4	3	3	1	2	-	1	1	1	1	1	-	1

**Course Content:****1. Electrochemical Phenomenon:**

Electrochemistry fundamentals & terminologies, Electrochemical and galvanic series, polarization, decomposition potential, over voltage. Theories of corrosion, Differential aeration theory. Factors influencing corrosion. Types of corrosion. Control of corrosion: Design and material selection, anodic and cathodic protection, protective coating, corrosion inhibitors. Electrochemical Sensors.

**2. Battery Technology:**

Introduction, Components of Cells and Batteries, Different Types of Batteries and their Classification: Primary cells, Secondary cells (Lithium-ion battery: Chemistry involved, Cathode materials, Anode materials, Electrolytes and Separators used. Reason why batteries explode) and Reserve cell (Water activated batteries, Electrolyte activated batteries, Gas activated batteries, Heat activated batteries), Fuel Cells.

Parameters for Selecting a Battery System, Application of Batteries as: conventional battery, automobile battery, laptop battery, torpedo battery, Electric Vehicles (EV) battery and Hybrid Electric Vehicles (HEV) battery, Capacitors. Thermal stress of batteries.

Solar Cells or Photovoltaic cells: Chemistry involved, Selection of materials, Construction, Working.

**3. Spectroscopy:**

Interaction of light radiation with matter; Types of transitions; Nuclear Resonance Spectroscopy: Basic Principle, Nuclear-spin and Resonance, Pulse-method, Relaxation processes – longitudinal and transverse, imaging method (MRI), diagnostic applications; Molecular spectroscopy: Absorption Spectroscopy, Fluorescence, Phosphorescence, Positron Emission Tomography (PET); Atomic Absorption Spectroscopy; Inductively Coupled Plasma (ICP): Advantages vs. disadvantages [comparison with other techniques], sensitivity, plasma generation from other sources.

**4. Electrical/Magnetic Properties & Polymers:**

Opto-electronic Materials: Diode materials: LED displays, quantum LED displays.



Magneto-electronic Materials: Molecular Magnets, Theory Biopolymers

Silicones: Manufacture and applications

Conducting polymers; Liquid crystal polymers.

#### 5. Environmental Chemistry:

Principles of sustainability and green chemistry, Standards for water and air quality. Environmental issues related to climate change, e-waste management.

Chemical elements in biological processes – Essential and non-essential elements in biological systems, Important biomolecules: carbohydrates, vitamins, proteins, nuclei acids – ribonucleic acid, transport across membranes in biological systems.

#### 6. Nanomaterials and nanotechnology:

Introduction, properties and applications of nano materials, Physical and chemical methods of synthesis [Deposition & Growth such as Physical Vapor Deposition (PVD), Chemical Vapor Deposition (CVD), Atomic Layer Deposition (ALD), epitaxy, Molecular Beam Epitaxy (MBE), Ion implantation], Introduction to Nanolithography. Emerging Nanostructure materials - Fullerenes, Bucky ball, carbon nanotubes.

#### Reference Books:

1. Dara, S.S. and S. S. Umare, A Text Book of Engineering Chemistry (Twelfth edition); S. Chand, 2014
2. Jain and Jain, Engineering Chemistry, 17th Eds; Dhanpat Rai publishing.
3. A.R. West, Solid-State Chemistry and its Applications, John Wiley & Sons, 1989.
4. L. E. Smart and E. A. Moore, Solid State Chemistry-An Introduction, Chapman and Hall, 1992.
5. K. Chakrabarty, Solid State Chemistry, New Age Publishers, 1996
6. C. N. R. Rao and J. Gopalkrishnan, New directions in solid state chemistry Cambridge Univ. Press 1997.
7. Shashi Chawla; A Text Book of Engineering Chemistry (Third edition); Dhanpat Rai & Co., 2006.
8. Kuriacose, J.C., Rajaram, J.; Chemistry in Engineering and Technology (Vol. 1&2); McGraw Hill, 1985.
9. Barrow, M. Gordon; Physical Chemistry (Fifth edition); McGraw-Hill, 1992.
10. C. N. BANWELL Fundamentals of. Molecular Spectroscopy. 3<sup>rd</sup> edition.

#### CHP103 Chemistry Laboratory

[0-0-2, Credit: 1]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech

**Assessment:** Mid-term Eval 40% + End Term Eval 60%

#### Course Objective:

- i. To develop skills and capabilities of students in applying knowledge of chemistry for solving real life problems.

#### Course Outcomes (CO):

1. Knows the proper procedures and regulations for safe handling and use of chemicals, and can follow the proper procedures and regulations for the safe handling when using chemicals.
2. Are able to design, carry out, record and analyze the results of chemical experiments. Are skilled in problem solving, critical thinking and analytical reasoning.



3. Ability to use modern instrumentation for chemical analysis and measurements.
4. Are able to communicate the results of their work to chemists and non-chemists.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	1	2	2	1	1	1	-	1
CO2	3	2	2	3	1	1	2	2	2	1	1	-
CO3	2	1	2	3	1	1	-	1	-	1	-	1
CO4	1	1	1	1	1	-	1	1	1	2	1	1

**Course Content:**

1. Water and waste water analysis: Determination of
  - i. Hardness
  - ii. Alkalinity
  - iii. Dissolved oxygen and free chlorine,
  - iv. Chloride, fluorides and COD,
  - v. Trace metal in water using Ion –selective electrodes, arsenic, lead, mercury.
2. Determination of capacity of ion exchange resin.
3. Analysis of ores and alloys
  - i. Determination of copper in brass
  - ii. Calcium in limestone and dolomite.
4. Demonstration experiments on instrumental methods of analysis
  - i. pH-metric and conductometric titration
  - ii. Colorimetric determination
  - iii. Turbidity by nephelometer
  - iv. Flame photometry
  - v. Flashpoint of lubricants
  - vi. Viscosity of lubricants
  - vii. Calorific value of solid fuels
  - viii. Proximate analysis of coal.
5. Chemical kinetics / Adsorption
  - i. Determination of rate constant
  - ii. Verify Freundlich Adsorption isotherm (study adsorption of acetic acid on activated charcoal)
6. Synthesis of paracetamol and aspirin, and its characterization.  
Fabrication of reserve batteries.

**CSL101 Computer Programming**

[3-0-2, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objectives:**

- i. To introduce basics of programming and develop logical thinking of students.
- ii. To help students understand how to model real world problems into the software and develop practical programming skills of students.
- iii. To implement mathematical statistical, applications into programming.

**Course Outcomes (CO):**

1. Understand basics of a computer program and develop logical steps to solve a computational problem using computers.
2. Understand different programming constructs and their syntax in C language and use them to implement a C program.
3. Develops the ability to analyze a problem, develop an algorithm to solve it.
4. Develops the use of the python programming language to implement various algorithms, and develops the basic concepts and terminology of python programming in general.
5. Understand and implement concepts of python language like looping, file handling, sorting, performing mathematical computations and visualization using libraries, solving simultaneous equations and plotting X-Y graph.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	2					2		2
CO2	3	2	3	2	2					3		3
CO3	3	3	3	3	3	2				1		2
CO4	3	2	3	3	1	2				3		3
CO5	3	3	3	3	2					2		2

**Course Content:**

**Introduction:** Fundamentals of Computer and programming, Program development and execution, basics of algorithms and flow charts.

**Basic Constructs in C:** Structure of C Programs, Keywords and Identifiers, Variables, DataTypes; Operators and Expressions: Precedence and Associativity, Type Conversions; Formatted Input/Output; Decision Making and Branching: if, if-else, switch-case; Loops: while, for, do-while; Arrays and Strings: 1-D and 2-D arrays, Functions: Pre-defined and User-defined functions, Scope and Lifetime of Variables, Recursive Functions; Structures: Defining and Accessing structure members, array of structures, nested structures; File Handling: basic operations.

**Python:** Variables and Data Types, String operations on Variables, Lists and its operations, Dictionaries and its operations, Formatted Input-Output, Creating and Calling Functions, Conditional Branching, Loops, File Handling, Basic Modules and Packages.

**Basic programming algorithms (C/Python):** printing patterns with nested loops, searching and sorting methods, factorial, Sine/Cosine and other mathematical series, square root computation, GCD (also with Euclid's method), Fibonacci series (also with recursive function); Performing mathematical computations and visualization using Python libraries – solving simultaneous equations, plotting X-Y graph, finding minima or maxima, Matrix manipulations, etc.

**Reference Books:**

1. The C programming language: Brian Kernighan and Dennis Ritchie, PHI-EEE
2. How to Solve it by Computer: R. G. Dromey, Pearson Education
3. Programming in Python 3 – A complete introduction to the Python Language, 2<sup>nd</sup> edition by Mark Summerfield, Publisher – Pearson
4. Computer Science: A Structured Programming Approach Using C - Behrouz A. Forouzan, Richard F. Gilberg



5. Programming in ANSI C, 8<sup>th</sup> edition by E. Balaguruswamy, Publisher - Mc Graw Hill

**EEL102 Electrical Engineering**

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech

**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

**Course Objective:**

- i. To learn basic ideas and principles of Electrical and Electronics Engineering
- ii. Understanding details of electrical machines and digital fundamentals.

**Course Outcomes (CO):**

- 1. Understand basics of electrical components.
- 2. Appreciate and analyze DC, AC and magnetic circuits using KVL and KCL.
- 3. Understand working principle of transformers
- 4. Be familiar with the working principals of electrical machines.
- 5. Be able to understand and utilize digital fundamentals.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1	-	1	1	-	-	-	3
CO2	3	3	3	3	-	-	-	-	1	-	-	3
CO3	3	2	-	-	1	-	-	-	-	-	-	2
CO4	3	2	1	1	2	2	-	2	1	2	1	3
CO5	3	2	2	2	2	2	-	-	-	-	1	2

**Course Content:**

Electrical Circuits: - Circuit Elements Resistance, Inductance & Capacitance,

Kirchhoff's Laws, Voltage Source (Definition, Characteristics of Practical Source, and Equivalent Current Source), and Star-Delta Transformation.

Magnetic Circuits: - Flux, MMF, Reluctance, Analogy with Electric Circuits. Simple Calculations for Composite Magnetic Circuits.

AC Circuits :-Periodic Function, Average & R.M.S., Values, Steady State Behavior With Sinusoidal Excitation, Phasor Representation, Reactance & Impedance, Series & Parallel Circuit,

Power Factor, Principle of Generation of Single Phase & Three Phase Voltages, Power in Balanced Three Phase AC System.

Transformers:- Introduction, Basic Principles, Construction, Phasor Diagram for Transformer under No Load Condition, Transformer on Load, Basic idea of Voltage Regulation and Efficiency.

Basic Idea of Electrical motors: -

- 1. DC Motors: Basic Idea of DC motor, Significance of back emf and need of starter, types of DC motors.



2. Induction Motors: Three phase Induction motor: Revolving magnetic field, synchronous speed, rotor speed, slip, it's applications Single phase Induction motor: Types and it's applications. Introduction of Induction motor as Drive.
3. Stepper Motors: speed control and it's applications.

Measuring Instruments: Introduction to analogue and Digital meters.

Digital Fundamentals:- Introduction to Number Systems, Boolean algebra and Logic Gates

**Text Books:**

1. D. C. Kulshrethta, "Basic Electrical Engineering", Tata Mcgraw Hill, 2012.
2. S.K. Bhattacharya , "Basic Electrical and Electronics Engineering", Pearson Education, 2012

**Reference Books:**

1. Kothari D.P. and Nagrath I.J., "Theory And Problems of Basic Electrical Engineering," Prentice Hall
2. Edward Hughes, "Electrical Technology", Pearson Education, 2008
3. Basic Electrical Engineering A Web course of NPTEL by Day, Bhattacharya & Roy, Available:- [www.nptel.ac.in](http://www.nptel.ac.in)
4. Anand Kumar, "Fundamentals of Digital Circuits", Second Edition, 2009, PHI
5. Malvino, Leach, "Digital Principles and Applications", Sixth Edition, 2006, McGraw Hill.

**EET102 Electrical Engineering Laboratory**

[0-0-2, Credit: 1]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech

**Assessment:** Mid-term Eval 40% + End Term Eval 60%

**Course Outcomes (CO):**

Students are able to

1. Understand basics of R,L, C circuit elements and voltage and current sources.
2. Appreciate and analyze DC, AC and magnetic circuits using KVL and KCL.
3. Be familiar with electronic devices and their applications.
4. Understand working principle of transformers.
5. Be familiar with electronic devices and utilize digital fundamentals.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1	-	1	1	-	-	-	3
CO2	3	3	3	3	-	-	-	-	1	-	-	3
CO3	3	2	-	-	1	-	-	-	-	-	-	2
CO4	3	2	1	1	2	2	-	2	1	2	1	3
CO5												

**List of Experiments:**

1. Study and verification of Kirchhoff's Laws applied to direct current circuit.
2. Determination of B/H curve of a magnetic material
3. Study of AC series circuits.
4. Study of AC Parallel circuits.



5. To determine Voltage regulation and efficiency of a single phase transformer by direct loading.
6. Reversal of direction of rotation of a three phase induction motor.
7. To study balanced three phase circuit.
8. Speed control of a DC motor by varying :-
  - a. Field current with armature voltage kept constant
  - b. Armature voltage with field current kept constant.
9. Study of logic gates.
10. Study and verification of Boolean algebra expressions.

**Reference Books:**

1. D. P. Kothari, B. S. Umre, "Laboratory manual for Electrical Machines – Second Edition" IK International Publishing House Pvt. Ltd., New Delhi.

**EEL103 Electrical Engineering**

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech

**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

**Course Objective:**

The objective of the course is

- i. To learn basic ideas and principles of Electrical and Electronics Engineering
- ii. Understanding details of electrical machines, electronic circuits and digital fundamentals

**Course Outcomes (CO):**

Students are able to

1. Understand basics of electrical components.
2. Appreciate and analyze DC, AC and magnetic circuits using KVL and KCL.
3. Understand working principle of electrical machines.
4. Be familiar with electronic devices and their applications.
5. Be able to understand and utilize digital fundamentals.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1	-	1	1	-	-	-	3
CO2	3	3	3	3	-	-	-	-	1	-	-	3
CO3	3	2	-	-	1	-	-	-	-	-	-	2
CO4	3	2	1	1	2	2	-	2	1	2	1	3
CO5	3	2	2	2	2	2	-	-	-	-	1	2



### Course Content:

**Electrical Circuits:-** Circuit Elements Resistance, Inductance & Capacitance, Kirchhoff's Laws, Voltage Source (Definition, Characteristics of Practical Source, and Equivalent Current Source), and Star-Delta Transformation.

**Magnetic Circuits:-** Flux, MMF, Reluctance, Analogy with Electric Circuits. Simple Calculations for Composite Magnetic Circuits.

**AC Circuits :-** Principle of Generation of Single Phase , Periodic Function, Average & R.M.S., Values, Steady State Behavior With Sinusoidal Excitation, Phasor Representation, Reactance & Impedance, Series & Parallel Circuit, Power Factor

**Transformers:-** Introduction, Basic Principles, Construction, Phasor Diagram for Transformer under No Load Condition, Transformer on Load, Basic idea of Voltage Regulation and Efficiency  
Introduction and applications of - 1) DC Motors 2) Induction Motors 3) Stepper Motors.

**Application of semiconductor diodes:-** Rectifier, Clipping and clamping circuits, etc.  
**Fundamentals of Bipolar Junction Transistor:-** Common emitter, common collector and common base configurations of BJT, Emitter follower, various Biasing circuits for BJT, BJT as a switch, BJT as amplifier. Basic introduction to OP-AMP.

**Digital Fundamentals:-**Number system (Binary, octal, hexadecimal, excess-3,etc), 2's complement representation, Boolean algebra, logic minimization using K maps, logic gates, Decoders, encoders, multiplexers, de-multiplexers, adder, subtractor, code converters (BCD to 7 segment and others)

### Text Books:

1. D. C. Kulshretha, "Basic Electrical Engineering", Tata Mcgraw Hill, 2012.
2. S.K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Education, 2012.
3. Millman Halkias, "Electronic Devices and Circuits", Tata McGraw Hill, 2000

### Reference Books:

1. Kothari D.P. and Nagrath I.J., "Theory And Problems of Basic Electrical Engineering," Prentice Hall
2. Edward Hughes, "Electrical Technology", Pearson Education , 2008
3. Basic Electrical Engineering A Web course of NPTEL by Day, Bhattacharya & Roy, Available:- [www.nptel.ac.in](http://www.nptel.ac.in)
4. Anand Kumar, "Fundamentals of Digital Circuits", Second Edition, 2009, PHI
5. Malvino, Leach, "Digital Principles and Applications", Sixth Edition, 2006, McGraw Hill.

### EEP103 Electrical Engineering Laboratory

[0-0-2, Credit: 1]

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech

**Assessment:** Mid-term Eval 40% + End Term Eval 60%

### Course Outcomes (CO):

Students are able to

1. Understand basics of R , L , C circuit elements and voltage and current sources.
2. Appreciate and analyse DC , AC and magnetic circuits using KVL and KCL.





3. Be familiar with electronic devices and their applications.
4. Understand working principle of transformers.
5. Be familiar with electronic devices and utilize digital fundamentals.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1	-	1	1	-	-	-	3
CO2	3	3	3	3	-	-	-	-	1	-	-	3
CO3	3	2	-	-	1	-	-	-	-	-	-	2
CO4	3	2	1	1	2	2	-	2	1	2	1	3
CO5												

**List of Experiments:**

1. Study and verification of Kirchhoff's Laws applied to direct current circuit.
2. Determination of B/H curve of a magnetic material
3. Study of AC series circuits.
4. Study of AC Parallel circuits.
5. Determine Voltage regulation and efficiency of a single phase transformer by direct loading.
6. Study of Half and Full wave rectifier
7. Study of BJT as amplifier.
8. Study of logic gates
9. Study and verification of Boolean Algebra expressions
10. Reversal of direction of rotation of a three phase induction motor.
11. Study of different mathematical operation using OP-AMP

**Reference Books:**

1. D. P. Kothari, B.S. Umre, "Laboratory manual for Electrical Machines – Second Edition" IK International Publishing House Pvt. Ltd., New Delhi.

**HUL101 Communication Skill**

[2-0-2, Credit: 3]

**Pre-requisites:** NIL **Type of Course:** HM**Semester:** I , II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objective:**

- i. To impart to the students the skills that they need in their academic, and later in their professional pursuit
- ii. To train the students to adopt an innovative approach to English language learning.

**Course Outcomes (CO):**

1. The syllabus enhances the language acquisition skill of the students (LSRW Skills)
2. It helps the students to acquire oral proficiency in English (Interpersonal Communication).
3. The course enables the students to have better presentation skills (GD, Interviews, PPT Presentations, Public Speaking)



4. It helps students sharpen their writing skills (CV, Resume, Job Applications, Reports, etc.)

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	---	---	---	1	---	---	---	2	3	3	3	2
CO2	---	---	---	1	---	---	---	3	3	3	3	2
CO3	---	---	---	1	---	---	---	2	3	3	3	2
CO4	---	---	---	1	---	---	---	2	2	3	2	2

**Course Content:**

**Unit 1: Energy-** Oil, Nuclear Preparation, Alternative Sources

**Unit 2: Computers-** Introducing Computers, New Frontiers, Computers in India

**Unit 3: Technology-** Appropriate Technology, Printing, Evaluating Technology

**Unit 4: Environment-** Pollution, Ecology, Our Living Environment

**Unit 5: Industry-** Personnel and Production, Safety and Training, Selling Products

**Reference Books:**

1. Department of Humanities and Social Sciences, Anna University., A Textbook of English for Engineers and Technologist, Orient Longman.
2. Quirk R, and Greenbaum S., A University Grammar of English
3. Krishnaswamy N., Modern English: A Book of Grammar- Usage And Composition, Macmillan India Ltd

**HUL102 Social Science**

[2-0-0, Credit: 2]

**Pre-requisites:** NIL **Type of Course:** HM

**Semester:** I, II Sem B Tech

**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

**Course Objective:**

- i. The objective of the course is to make the students familiar with the basic concepts used to understand the social, cultural and political activities with context to Indian society.

**Course Outcomes (CO):**

1. To understand the basic concepts in social science in the era of globalization.
2. To get an awareness about social problems and issues in the nation.
3. To gain knowledge of society and nation development with science and technology.
4. Know the constitutional set-up, bureaucracy and current situation of India.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	---	---	---	1	---	3	3	3	3	3	1	3
CO2	---	---	1	3	---	3	2	3	3	3	2	3
CO3	---	---	3	3	---	3	2	3	3	3	1	3
CO4	---	---	3	---	---	3	1	3	3	3	1	3



## Course Content:

### Unit I Introduction

1. Meaning, scope and general utility of social sciences.
2. Society: types, characteristics and problems.

### Unit II Fundamental concept in social science

1. Culture: types, characteristics, merit, demerit and some related terms.
2. Economics and social sustainable development.
3. Human resource management, public health, law enforcement and good governance.
4. Social control and social change.

### Unit III Industrialization and Society

1. Field, involvement and development of science and technology.
2. Human values and professional ethics.
3. General issues on environment ecology, bi-diversity and climate change.
4. Motivation, selection and training of employees.

### Unit IV The study of Political Orientation

1. Indian constitution and federal system.
2. Fundamental rights and directive principles.
3. Right to information (RTI).
4. Beurocracy in India.

### Unit V Social Problems in India

1. Over Population.
2. Poverty.
3. Slum.
4. Family disorganization (divorce)
5. Corruption

### Reference Books:

1. Social and Ethical Sciences for Engineers, Dr. G N Nimbarte, Mangesh Publication Nagpur
2. Social Problems in India, Ram Ahuja, Rawat Publication Jaipur
3. Ethical Science, Dr. G N Nimbarte, Dattson Publication, Nagpur
4. Introduction to Sociology, Vidhyabhushan and Sachdeva, KitabMahal, New Delhi
5. Social Problems in India, Dr. G N Nimbarte, Sankalp Publication, Nagpur

## MAL101 Mathematics-I

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I Sem B Tech

**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

### Course Objective:

- i. The objective of this course is to expose student to understand the basic importance of Differential calculus, Integral calculus, Infinite series and Matrix theory in science and engineering.

**Course Outcomes (CO):** After completing this course students will be able to



1. Deal with differential calculus of functions of single variable and its applications.
2. Understand concepts of integration of function of single variable and its applications.
3. Test the convergence of sequence and series.
4. Understand basic concepts of matrix theory and can apply it to solve problems of engineering

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	---	---	---	---	---	---	---	---	2
CO2	3	2	1	---	---	---	---	---	---	---	---	2
CO3	3	2	1	---	---	---	---	---	---	---	---	2
CO4	3	2	1	---	---	---	---	---	---	---	---	2

**Course Content:**

**Differential Calculus:** Functions of single variable: Review of limit, continuity and differentiability. Mean value theorems: Rolle's theorem, Lagrange's theorem, Cauchy's theorem, Taylor's theorem with Lagrange's form of remainder, curve tracing.

**Integral Calculus:** Fundamental theorem of Integral calculus, mean value theorems, evaluation of definite integrals, applications in area, length, volumes and surface of solids of revolutions, Improper integrals: Beta and Gamma functions, differentiation under integral sign.

**Infinite series:** Sequences, Infinite series of real and complex numbers, Cauchy criterion, tests of convergence, absolute and conditional convergence, improper integrals, improper integrals depending on a parameter, uniform convergence, power series, radius of convergence.

**Matrices:** Rank of matrix, consistency of a system of equations, linear dependence and independence, linear and orthogonal transformations, Eigen values and Eigen vectors, Cayley Hamilton theorem, reduction to diagonal form, Hermitian and skew Hermitian matrices, Quadratic forms.

**Reference Books:**

1. Kreyszig, E. ; Advanced Engineering Mathematics (10th Edition); John Wiley & Sons, 2011.
2. Jain, R.K. and Iyengar, S.R.K.; Advanced Engineering Mathematics(5th Edition); NarosaPublishers, 2016.
3. Thomas, G.B. and Finney, R.L.; Calculus and Analytic Geometry (9th Edition); Addison Wesley Longman, Inc., 2002
4. Michael D. Greenberg: Advanced Engineering Mathematics, Pearson Education Pvt. Ltd., 2002.
5. Piskunov, N. : Differential and Integral calculus, Vol.1, Vol.2 MIR Publishers, Moscow- CBS Publishers and Distributors (India),2022.

**MAL102 Mathematics-II**

[3-1-0, Credit: 4]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** IISem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

**Course Objective:**

- i. The objective of this subject is to expose student to understand the basic importance of multi variable calculus (Differential calculus & Integral calculus), Vector calculus and ordinary differential equations in engineering

**Course Outcomes (CO):** After completing this course students will be able to

1. Deal with differential calculus of functions of several variables and their applications.
2. Understand concepts of multiple integrals and their applications in engineering problems.
3. Understand the concepts of vector calculus and its applications in Engineering and Science.
4. Solve certain class of ordinary differential equations related to Science and Engineering.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	---	---	---	---	---	---	---	---	2
CO2	3	2	1	---	---	---	---	---	---	---	---	2
CO3	3	2	1	---	---	---	---	---	---	---	---	2
CO4	3	2	1	---	---	---	---	---	---	---	---	2

**Course Content:**

**Several Variables Calculus:** Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation, Tangent plane and normal line. Euler's theorem on homogeneous functions, Total differentiation, chain rules, Jacobian, Taylor's formula, maxima and minima, Lagrange's method of undetermined multipliers.

**Multiple Integrals:** Double and triple integrals, change of order of integration, change of variables, application to area, volumes, Mass, Centre of gravity.

**Vector Calculus:** Scalar and vector fields, gradient of scalar point function, directional derivatives, divergence and curl of vector point function, solenoidal and irrotational motion.

**Vector integration:** line, surface and volume integrals, Green's theorem, Stoke's theorem and Gauss divergence theorem (without proof).

**Ordinary Differential Equations:** First order differential equations: Exact equation, Integrating factors, Reducible to exact differential equations, Linear and Bernoulli's form, orthogonal trajectories, Existence and Uniqueness of solutions. Picard's theorem, Picard's iteration method of solution (Statements only). Solutions of second and higher order linear equation with constant coefficients, Linear independence and dependence, Method of variation of parameters, Solution of Cauchy's equation, simultaneous linear equations.

**Reference Books:**

1. Kreyszig, E. ; Advanced Engineering Mathematics (10th Edition); John Wiley & Sons, 2011.
2. Jain, R.K. and Iyengar, S.R.K.; Advanced Engineering Mathematics (5th Edition);; Narosa Publishers, 2016.
3. Thomas, G.B. and Finney, R.L.; Calculus and Analytic Geometry (9th Edition); Addison Wesley Longman, Inc., 2002
4. Piskunov, N. : Differential and Integral calculus, Vol.1, Vol.2 MIR Publishers, Moscow- CBS Publishers and Distributors (India),2022.



5. Michael D. Greenberg: Advanced Engineering Mathematics, Pearson Education Pvt. Ltd., 2002.

**MEL103 Engineering Drawing**[3-0-0, **Credit: 3**]**Pre-requisites:** NIL**Type of Course:** ES**Semester:** I , II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objective:**

- To understand the principles and methods of projections as per National Standards.
- To develop the visualization skills for interpretation of use of various objects like lines, planes, solids, sections of solids & development of lateral surfaces.
- To acquire skills to interpret and convert multi-views drawing into single view and vice versa.
- To understand and acquire basic skills in Computer Aided Drafting.

**Course Outcomes (CO):**

- Students will be able to understand the conventions and standards for engineering drawing.
- Students will be able to apply the knowledge of projections and methods to prepare the drawing for lines, planes, solids, sections of solids and development of lateral surfaces.
- Students will be able to visualize and convert 2D to 3D drawing and vice versa.
- Students will be able to understand and apply Computer Aided Drafting in real practice.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	2	1	3	1	3	3	3	2	3
CO2	2	2	2	1	3	2	2	2	3	3	3	2
CO3	3	2	2	2	3	2	2	2	3	3	3	2
CO4	2	2	2	2	3	1	2	2	3	3	3	3

**Course Content:**

Introduction to BIS SP-46-2003, Use of various drawing instruments, Concept of scales, Representative Fraction (RF) and dimensioning, Conversation of Pictorial views to orthographic/profile views, orthographic projections of points, lines, plane on principle planes/Profile plane/Auxiliary planes.

Projection of right regular solids inclined to both the planes. Section and development of surfaces of solids. (Preferably in normal position/ Inclined to one plane).

Drawing isometric views and projection from orthographic projection/ orthographic views.

Introduction to Computer Aided Drafting (CADr)- Basic commands for Setting, Drawing, Editing, Writing, Dimensioning and other features. (Evaluation of CADr through TA component only.)

**Reference Books:**

1. Bhatt N.D and Panchal VM, Elementary Engineering Drawing, (Plane and Solid Geometry), Charotar Publishing House, 53rd Edition.
2. Jolhe Dhananjay, Engineering Drawing with an introduction to AutoCAD, Tata McGraw Hill Publishing Company Limited, Edition 2020.
3. BIS-SP-46-2003, Engineering Drawing Practices for School & Colleges.

**MEP103 Engineering Drawing Practical**

[0-0-2, Credit:1]

**Pre-requisites:** NIL**Type of Course:** ES**Semester:** I , II Sem B Tech**Assessment:** Mid-term Eval 40% + End Term Eval 60%**Course Objective:**

The objectives of the course are

- i. To understand the principles and methods of projections as per National Standards.
- ii. To develop the visualization skills for interpretation of use of various objects like lines, planes, solids, sections of solids and development of lateral surfaces.
- iii. To acquire skills to interpret and convert multi-views drawing into single view and vice versa.
- iv. To understand and acquire basic skills in Computer Aided Drafting.

**Course Outcomes (CO):**

1. Students will be able to understand the conventions and standards for engineering drawing.
2. Students will be able to apply the knowledge of projections and methods to prepare the drawing for lines, planes, solids, sections of solids and development of lateral surfaces.
3. Students will be able to visualize and convert 2D to 3D drawing and vice versa.
4. Students will be able to understand and apply Computer Aided Drafting in real practice.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	1	2	1	3	1	3	3	3	2	3
CO2	2	2	2	1	3	2	2	2	3	3	3	2
CO3	3	2	2	2	3	2	2	2	3	3	3	2
CO4	2	2	2	2	3	1	2	2	3	3	3	3

**Course Content:**

Introduction to BIS SP-46-2003. Explanation of various drawing instruments, symbols, dimensioning, line types, concept of scales and Representative Fraction (RF).

Conversion of pictorial views to orthographic / profile views.

Projections of points and lines.

REVIEW I of sheets.

Projections of planes. Projections of lines and planes using Auxiliary planes.

Projections of solids.

REVIEW II of sheets.

Section and development of solids.

Isometric views.

Computer Aided Drafting (CADr) assignments.



REVIEW III of sheets & CADr assignments.

### Reference Books:

1. Bhatt N.D and Panchal VM, Elementary Engineering Drawing, (Plane and Solid Geometry), Charotar Publishing House, 53rd Edition.
2. Jolhe Dhananjay, Engineering Drawing with an introduction to AutoCAD, Tata McGraw Hill Publishing Company Limited, Edition 2020.
3. BIS-SP-46-2003, Engineering Drawing Practices for School & Colleges.

### PHL102 Physics

[3-1-0, Credit:4]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech

**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%

### Course Objective:

- i. Provides a strong foundation in physics in preparation for technical or scientific careers.
- ii. The skills to be able to function as productive, qualified engineering professionals in areas where traditional science and engineering disciplines overlap.
- iii. An awareness of the importance of continued professional development.

### Course Outcomes (CO):

Student will be able to understand, apply and analyze:

1. Concept of quantum mechanics and its application, fundamentals of quantum computing.
2. Primitive crystal systems through packing density and Miller indices.
3. Concepts of semiconductors based on band theory
4. Physics of electronic devices
5. Basics of LASERs and its applications, understanding of optical fibers

### Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	---	2	---	---	---	---	---	1	---	---
CO2	3	2	---	---	---	---	---	---	---	2	---	---
CO3	3	2	---	2	---	---	---	---	---	1	---	---
CO4	3	2	---	2	---	---	---	---	---	1	---	---
CO5	3	2	---	1	---	---	---	---	---	1	---	---

### Course Content:

**Quantum Mechanics:** Origin of quantum mechanics, Compton effect, Concept of matter waves, Davission and Germer's experiment, Heisenberg's Uncertainty principle, Schrodinger's Wave equation and its application and Quantization of energy.

**Applications of Quantum Mechanics:** Particle in 1,2 and 3 dimensional infinite potential well, Quantization of energy, Operators, Eigen states and Eigen values, Introduction to quantum computing.





**Elementary crystal structure:** Unit cell and its characteristics in SC, BCC, FCC crystal structure, Miller indices, Bragg's Law, inter-planer spacing.

**Semiconductor Physics:** Formation of energy bands in solid, classification of solids: intrinsic and extrinsic semiconductor, Fermi level in an intrinsic and extrinsic semiconductor, Hall effect.

**Device Physics:** V-I characteristics of p-n junction diode, zener diode, photo diode, LED, BJT, FET and MOSFET.

**LASER Optics:** Introduction to LASER, Spontaneous and Stimulated Emission, Different types of CW & Pulse lasers & their characteristics, Principle & characteristics of optical fibers, Different types of optical fibers.

**Reference Books :**

1. Fundamental of Physics, Resnick, Walker and Halliday, John Willey and Sons. Inc, 6<sup>th</sup> Edition (2005).
2. Modern Physics, Kenneth Krane; (2<sup>nd</sup> Edition); John Wiley Eastern (1998)
3. Introduction to Quantum Mechanics by David J. Griffiths Publisher: Cambridge India (2016)
4. Solid State Physics, A.J. Dekker, MacMillan, Student Edition (2000)
5. Solid State Electronics, B. G. Streetman, Prentice Hall India (2<sup>nd</sup> Edition) (1986)
6. Electrical Engineering Materials, A.J Dekkar; Prentice Hall og India Publication (1992)
7. Semiconductor devices (Physics and Technology), S.M. Sze, II Edition, Wiley India Pvt. Ltd.
8. Lasers and non linear optics, B.B. Laud, New Age International limited (1991).

**PHP102 Physics Laboratory**

[0-0-2, **Credit:1**]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech

**Assessment:** Mid-term Eval 40% + End Term Eval 60%

**Course Objective:**

- i. The Objective of this course is to make the students gain practical knowledge to co-relate with the theoretical studies.
- ii. To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to develop and fabricate engineering and technical equipments.
- iii. Design of circuits using new technology and latest components and to develop practical applications of engineering materials and use of principle in the right way to implement the modern technology.

**Course Outcomes (CO):**

Student will be able to:

1. Demonstrate experimental skills, analyze and interpret the results obtained.
2. Acquire written communication skill to write reports of experiments performed in the lab.
3. Understand basic concepts of Physics and develop oral communication skills.
4. Enhance understanding of concepts in physics by performing practical.
5. Function effectively as an individual and as a member of a team.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	---	---	3	---	---	---	---	---	1	---	---
CO2	---	---	---	---	---	---	---	---	---	3	---	---
CO3	3	---	---	2	---	---	---	---	---	2	---	---
CO4	3	---	---	3	---	---	---	---	---	1	---	---
CO5	-	---	---	---	---	---	---	---	3	1	---	---

**List of the Experiments :**

1. To study the characteristics of Photocell and to determine the work function of the cathode material.
2. To calibrate an electromagnet and to study the dependence of Hall voltage on magnetic field and current through the sample.
3. To study the I/P, O/P and transfer characteristics and to determine ' $\alpha$ ' of transistor in common base mode.
4. To study I-V characteristics of conventional p-n junction diode and Zener diode
5. To determine the energy band gap in a semiconductor using reverse biased p-n junction diode.
6. Study of voltage regulation using Zener diode.
7. Study of output characteristics and transfer characteristics of FET.
8. To determine numerical aperture of the optical fibers
9. To determine wavelength of He-Ne LASER

**PHL103 Physics**

[3-1-0, Credit:4]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech**Assessment:** Mid Sem 30 % + TA 10%+ End Sem 60%**Course Objective:**

- i. Provides a strong foundation in physics and mathematics in preparation for technical or scientific careers.
- ii. The skills to be able to function as productive, qualified engineering professionals in areas where traditional science and engineering disciplines overlap.
- iii. An awareness of the importance of continued professional development.

**Course Outcomes (CO):**

Student will be able to understand, apply and analyze:

1. Evolution of elementary concepts of quantum mechanics and their applications.
2. Primitive crystal systems through packing density and Miller indices.
3. Concepts of semiconductors based on band theory
4. Elementary ideas of ultrasonic and its applications
5. Basics of LASERS and its applications, understanding of optical fibers

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	---	2	---	---	---	---	---	1	---	---
CO2	3	2	---	---	---	---	---	---	---	2	---	---
CO3	3	2	---	2	---	---	---	---	---	1	---	---
CO4	3	2	---	2	---	---	---	---	---	1	---	---
CO5	3	2	---	1	---	---	---	---	---	1	---	---

**Course Content:**

**Quantum Mechanics:** Black Body Radiations, Photoelectric effect, Compton effect, Concept of matter waves, Davission and Germer's experiment, Heisenberg's Uncertainty principle, Schrodinger's Wave equation and its application, quantization of energy.

**Crystal Structure :** Unit cell and its characteristics in SC , BCC, FCC crystal structure, Miller indices, Bragg's Law, crystalline and amorphous materials, structural determination by XRD.

**Semiconductor Physics:** Formation of energy bands in solid, classification of solids, intrinsic and extrinsic semiconductor, Fermi level in an intrinsic and extrinsic semiconductor, Hall effect, p-n junction diode, transistors.

**Ultrasonic:** Piezoelectricity, magnetostriction, ultrasonic waves and their application in non-destructive testing, sensors.

**LASER Optics:** Introduction to LASER, Spontaneous and Stimulated Emission, Different types of CW & Pulse LASERs and their characteristics, Principle and characteristics of optical fibers, Different types of optical fibers.

**Reference Books :**

1. Fundamental of Physics, Resnick, Walker and Halliday, John Willey and Sons. Inc, 6<sup>th</sup> Edition (2005).
2. Modern Physics, Kenneth Krane; 2<sup>nd</sup> Edition; John Wiley Eastern (1998)
3. Introduction to Quantum Mechanics, David J. Griffiths :Cambridge India (2016)
4. Solid State Physics, A.J. Dekker, MacMillan Students Edition (2000)
5. Electrical Engineering Materials, A.J Dekkar, Prentice Hall India Publication (1992)
6. Ultrasonics: Fundamentals and applications , Heinrich Kuttruff, Elsevier Applied Science (1991)
7. Lasers and nonlinear optics, B.B. Laud, New Age International Limited (1991)

**PHP103 Physics Laboratory**

[0-0-2,Credit:1]

**Pre-requisites:** NIL **Type of Course:** BS **Semester:** I , II Sem B Tech**Assessment:** Mid-term Eval 40% + End Term Eval 60%

**Course Objective:**

- i. The Objective of this course is to make the students gain practical knowledge to co-relate with the theoretical studies.
- ii. To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to develop and fabricate engineering and technical equipments.
- iii. Design of circuits using new technology and latest components and to develop practical applications of engineering materials and use of principle in the right way to implement the modern technology.

**Course Outcomes (CO):**

Student will be able to:

1. Demonstrate experimental skills, analyze and interpret the results obtained.
2. Acquire written communication skill to write reports of experiments performed in the lab.
3. Understand basic concepts of Physics and develop oral communication skills.
4. Enhance understanding of concepts in physics by performing practicals.
5. Function effectively as an individual and as a member of a team.

**Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	---	---	3	---	---	---	---	---	1	---	---
CO2	---	---	---	---	---	---	---	---	---	3	---	---
CO3	3	---	---	2	---	---	---	---	---	2	---	---
CO4	3	---	---	3	---	---	---	---	---	1	---	---
CO5	-	---	---	---	---	---	---	---	3	1	---	---

**List of the Experiments :**

1. To study the characteristics of Photocell and to determine the work function of the cathode material.
2. To calibrate an electromagnet and to study the dependence of Hall voltage on magnetic field and current through the sample.
3. To study the I/P, O/P and transfer characteristics and to determine ' $\alpha$ ' of transistor in common base mode.
4. To study the forward and reverse characteristics of semiconductor diode.
5. To determine the energy band gap in a semiconductor using reverse biased p-n junction diode.
6. To calibrate an audio frequency oscillator and to determine the unknown frequency and phase of RC network by using single trace CRO.
7. To determine the velocity of ultrasonic waves in a liquid.
8. To determine numerical aperture of the optical fibers
9. To determine wavelength of He-Ne LASER



## MEP102 Workshop

**Pre-requisites:** NIL **Type of Course:** ES **Semester:** I , II Sem B Tech

**Assessment:** TA 100%

### Course Objective:

The objectives of the course are

- i. To make the students aware with various skills involved in basic engineering processes for manufacturing and assembly.
- ii. To make students aware of various basic engineering processes like cutting, filing and joining and to have hands on experience for the same.

### Course Outcomes (CO):

At the end of the course students will be able to

1. Acquire skills in basic engineering practice.
2. Identify the hand tools and instruments.
3. Gain measuring skills.
4. Obtain practical skills in the various trades.
5. Enhance psycho motor skills and attitude

### Course Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	1	1	2	2	2	3	2	2	1
CO2	3	1	2	1	1	2	2	2	3	2	2	1
CO3	3	1	2	1	1	2	1	2	3	2	1	2
CO4	3	1	2	1	1	3	2	2	3	2	1	2

### Course Content:

**Fitting:** Use and setting of fitting tools for chipping, cutting, filing, and marking, center punching, drilling, and tapping. Term work to include one job involving following operations: Filing to size, drilling and tapping.

**Carpentry:** Use and setting of hand tools like hacksaws, Jack planes, chisels and gauges for construction of various joints, wood turning and modern wood turning methods. Term work to include one carpentry job involving a joint and report on demonstration of a job involving wood turning.

**Welding:** Use and setting of tools and equipments for edge preparation for welding jobs and Arc welding for Jobs like, Lap welding of two plates, butt welding of plates.

**Machining:** At least one metal turning job is to be demonstrated.

**CNC Machines:** One job on CNC Lathe and CNC Milling machine to be demonstrated.

**Foundry:** At least one demonstration of mould making.

**Sheet Metal Working:** Use and setting of tools like Shears, Stakes, Hammers, Snips, Punches, Riveting gun etc. and equipments for sheet metal working. At least one job/demonstration of making of an article from surface development drawings.

**Plumbing:** Use and setting of hand tools like hacksaws, Vices, V blocks, Taps , Tap wrenches, Pipe



wrenches, Pipe threading dies, pipe bending dies, Pipe cutters, calipers etc for plumbing works. At least one job/ demonstration involving threading and Joining of pipes.

**Assembly:** Using and setting various workshop tools like spanners, wrenches, screw drivers, torque wrenches, hammers, and pliers etc. to assemble and disassemble an engineering system (e.g. bicycle, etc). At least one job/ demonstration of assembly/ disassembly of an engineering system.

**Reference Books:**

1. Workshop Technology by W. A. J. Chapmen, PartI,II &III.

**SAA101 Health Information and Sports-Part I**

[0-0-2,Credit:0]

**Prerequisites:** NIL. **Type of Course:** AU. **Semester:** I

**Assessment:** End Sem100%

**Course Objective:**

- i. To provide information about physical, Physiological & Psychological aspects of sports & physical.
- ii. To create awareness among the students about their health status, by conducting various physical fitness tests and suggest them suitable remedial physical fitness programme.
- iii. To provide information of different therapeutic exercises.
- iv. To make students aware about the rules and regulation of different games & sports.
- v. To provide opportunity to mingle with each other through participating in different physical education & sports activities.

**Course Outcomes (CO):**

1. Enriched proper knowledge among the students about emerging issues such as health & fitness, wellness etc.
2. Students will become aware about the sense of discipline & dedication in general life, develop the spirit of team work through various physical education & sports activities.
3. Development of rational thinking and scientific temper among the students.

**Course Content:**

1. Introduction to psychological problem of a sports person
  - i. Brief discussion on the technical aspect of sports psychology
  - ii. Relaxation
  - iii. Hypnotherapy
  - iv. Counseling
  - v. Autosuggestion
  - vi. Visualization
  - vii. Imagination
  - viii. Leadership building
  - ix. Mental rehearsal
  - x. Neuropsychological technique for concentration, reaction time, eye hand coordination
  - xi. Self-motivational instruction coaches workout and observation
2. Warming up, Cooling Down & Full Body Stretching
3. Obesity & its Management :Daily caloric requirements and daily energy expenditure
4. Scientific principles of training



5. Health & Performance related physical fitness

**Practical:**

1. The student must actively participate in games: Football, Basketball, Volleyball, Handball, Cricket, Kho-Kho, Kabaddi, Badminton, Table Tennis, Yoga etc.
2. Physical Efficiency Test
3. Intramural Sports Programme
4. Minor Techno sport projects

**Reference Books:**

1. Edlin, Golanty and Brown, Health and wellness (Joines and Bartlett (5<sup>th</sup> & 7<sup>th</sup> Edition) Publishers, London) 2002
2. Arnold G. Nelson, (2007), "Stretching Anatomy" Human Kinetics
3. Marcia K. Anderson & Susan J. Hall (1997), Fundamentals of Sports Injury Management "Lippincott Williams & Wilkins

**SAA102 Health Information and Sports- Part II**

[0-0-2, Credit:0]

**Prerequisites:** NIL. **Type of Course:** AU. **Semester:** I Sem B.Tech.

**Assessment:** End Sem 100%

**Course Objective:**

- i. To make the learner enable to know the conditions of stress and its management technique.
- ii. To deliver the knowledge of daily calorie requirement and obesity.
- iii. To provide information of different training principles for practicing different sports & games.
- iv. To motivate the students to innovate new technologies in the field of physical education & sports.

**Course Outcomes (CO):**

1. The learner will be able to manage his stress level.
2. The student will be able to design his diet chart as per his daily requirements.
3. Students will be able to create some new designs of sports facilities and equipments.

**Course Content:**

1. Adjustment, Frustration, Tension and conflict
  - i. Meaning & Definition of Adjustment & Frustration
  - ii. Kinds & Causes of Frustration
2. Periodization: Preparatory period, Competition period and transitional period
3. Effects of exercise on various physiological systems
4. Therapeutic Exercise & Therapeutic Modalities
5. The Science of Stress & its yogic Management

**Practical:**

1. The student must actively participate in games: Football, Basketball, Volleyball, Handball, Kabaddi, Badminton, Table Tennis, Chess, Yoga etc.
2. Intramural Sports Programme
3. Physical Efficiency Test

**Reference Books:**

1. Edlin, Golanty and Brown, Health and wellness (Joines and Bartlett (5<sup>th</sup> & 7<sup>th</sup> Edition)



Publishers, London) 2002

2. Arnold G. Nelson,(2007),“Stretching Anatomy” Human Kinetics
3. Marcia K. Anderson & Susan J. Hall(1997),Fundamentals of Sports Injury Management ” Lippincott Williams &Wilkins





## GRADING SYSTEM

Continuous evaluation process, based on student's performance in uniformly placed Mid Semester Examination, Teachers Assessment (TA) and End-Semester Examination for each course. At the end of semester, grades shall be awarded by course coordinator or concerned faculty as a performance indicator. Details of these grades are as given below.

Grades	Grade Points	Description of performance
AA	10	Outstanding
AB	09	Excellent
BB	08	Very Good
BC	07	Good
CC	06	Average
CD	05	Below Average
DD	04	Marginal
FF	00	Very-poor/ Unsatisfactory / Absence in End-Sem Examination
W		Attendance Less than 75 %. Not Eligible for End-Sem Examination. Shall repeat the Course
SS		Satisfactory Completion of Audit Course
ZZ		Un-satisfactory / Audit Course continuation

### Calculations of SGPA & CGPA

Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA) is calculated as follows,

$$\text{SGPA} = \frac{\sum_{\text{Semester}} (\text{Course credits} \times \text{Grade points}) \text{ for all courses with pass grade in a semester}}{\sum_{\text{Semester}} (\text{Course credits}) \text{ for all courses in a semester except audit}}$$

$$\text{CGPA} = \frac{\sum_{\text{Semester}} (\text{Course credits} \times \text{Grade points}) \text{ for all courses with pass grade in all the semesters}}{\sum_{\text{Semester}} (\text{Course credits}) \text{ for all the courses except audit}}$$



## ATTENDANCE

All students must attend every class and 100% attendance is expected from the students. However, in consideration of the constraints/ unavoidable circumstances, the attendance can be relaxed by course co-ordinator only to the extent of not more than 25%. Every student must attend minimum of 75% of the classes actually held for that Course

A student with less than 75% attendance in a course during the semester will be awarded W grade. Such a student will not be eligible to appear for the end semester and re-examination of that course. Even if such a student happens to appear for these examinations, then, answer books of such students will not be evaluated. A student with W grade is not eligible to appear for Re-examination and summer term also. Students will be informed about their attendance status by respective course coordinator at the end of 4-6 weeks of teaching and after mid semester examination.

## REGISTRATION & ENROLLMENT

Registration is a very important procedural part of the academic system. The registration procedure ensures that the student's name is on the roll list of each course that he/she wants to study. **Web based registration** facility is available but only on the intranet of VNIT, Nagpur. The choice of courses must be approved by his/her faculty adviser/ faculty Mentor.

The format of the registration forms for winter and summer sessions are as given on next pages.

**Visvesvaraya National Institute of Technology, Nagpur****Registration Form for Enrolment in Odd Semester for Session 2023-24 (Winter-2023)**(To be filled in Blue Ink in Capital letters only) Instruction: Please Tick  appropriately and properly)

Name : \_\_\_\_\_ Enrolment No. : \_\_\_\_\_

ID No. : \_\_\_\_\_ Name of Faculty Advisor : \_\_\_\_\_ Contact No. : \_\_\_\_\_

Current Address : \_\_\_\_\_

E-mail : \_\_\_\_\_ Parents Mo. No. : \_\_\_\_\_

**Applicable for Departments – CIV (SECTION W), CME (X), MIN (Y), MME (Z)****Physics Stream, I Semester (Winter 2023)**

Sr. No.	Code	Course Title / Name	Course Offered for Department	Type	Credit	Slot	Offered (YES / NO)	Selection
1	AML153	ENGINEERING MECHANICS – 2	CIV / MIN / MME	ES	4		Offered	Yes / No
2	AMP153	ENGINEERING MECHANICS – 2	CIV / MIN / MME	ES	1		Offered	Yes / No
3	AML152	ENGINEERING MECHANICS – 1	CME	ES	4		Offered	Yes / No
4	AMP152	ENGINEERING MECHANICS – 1	CME	ES	1		Offered	Yes / No
5	HUL101	COMMUNICATION SKILL	CIV / CME / MIN / MME	HM	3		Offered	Yes / No
6	MAL102	MATHEMATICS I	CIV / CME / MIN / MME	BS	4		Offered	Yes / No
7	MEL103	ENGINEERING DRAWING	CIV / CME / MIN / MME	ES	3		Offered	Yes / No
8	MEP103	ENGINEERING DRAWING	CIV / CME / MIN / MME	ES	1		Offered	Yes / No
9	PHL103	PHYSICS – 2	CIV / CME / MIN / MME	BS	4		Offered	Yes / No
10	PHP103	PHYSICS – 2	CIV / CME / MIN / MME	BS	1		Offered	Yes / No
11	SAA102	HEALTH INFORMATION AND SPORTS - I	CIV / CME / MIN / MME	AU	0		Offered	Yes / No

\* CIV :- Civil Engg., CME:-Chemical Engg. ,  
MIN :- Mining Engg, MME :- Metallurgical & Materials Engg.

Signature of Student

Signature of Faculty Advisor

Date:

Date:

**Visvesvaraya National Institute of Technology, Nagpur****Registration Form for Enrolment in Odd Semester for Session 2023-24 (Winter-2023)**(To be filled in Blue Ink in Capital letters only) Instruction: Please Tick  appropriately and properly)

Name : \_\_\_\_\_ Enrolment No. : \_\_\_\_\_

ID No. : \_\_\_\_\_ Name of Faculty Advisor : \_\_\_\_\_ Contact No. : \_\_\_\_\_

Current Address : \_\_\_\_\_

E-mail : \_\_\_\_\_ Parents Mo. No. : \_\_\_\_\_

**Applicable for Department – CSE (SECTION R), ECE (S), EEE (T), MEC (U)****Chemistry Stream, I Semester (Winter 2023)**

Sr. No.	Code	Course Title / Name	Course Offered for Department	Type	Credit	SLOT	Offered (YES / NO)	Selection
1	CHL103	CHEMISTRY – 2	CSE / ECE / EEE	BS	4		Offered	Yes / No
2	CHP103	CHEMISTRY – 2	CSE / ECE / EEE	BS	1		Offered	Yes / No
3	CHL102	CHEMISTRY – 1	MEC	BS	4		Offered	Yes / No
4	CHP102	CHEMISTRY – 1	MEC	BS	1		Offered	Yes / No
5	CSL101	COMPUTER PROGRAMMING	CSE / ECE / EEE / MEC	ES	4		Offered	Yes / No
6	EEL103	ELECTRICAL ENGINEERING – 2	CSE / ECE / EEE	ES	4		Offered	Yes / No
7	EEL103	ELECTRICAL ENGINEERING – 2	CSE / ECE / EEE	ES	1		Offered	Yes / No
8	EEL102	ELECTRICAL ENGINEERING – 1	MEC	ES	4		Offered	Yes / No
9	EEL102	ELECTRICAL ENGINEERING – 1	MEC	ES	1		Offered	Yes / No
10	HUL102	SOCIAL SCIENCE	CSE / ECE / EEE / MEC	HM	2		Offered	Yes / No
11	MAL102	MATHEMATICS I	CSE / ECE / EEE / MEC	BS	4		Offered	Yes / No
12	MEP101	WORKSHOP	CSE / ECE / EEE / MEC	ES	2		Offered	Yes / No
13	SAA102	HEALTH INFORMATION AND SPORTS - I	CSE / ECE / EEE / MEC	AU	0		Offered	Yes / No

\* CSE :- Computer Science Engg., ECE:-Electronics & Communication Engg. ,  
EEE :- Electronics & Electrical Engg, MEC :- Mechanical Engg.

Signature of Student

Signature of Faculty Advisor

Date:

Date:

**Visvesvaraya National Institute of Technology, Nagpur****Registration Form for Enrollment in Even Semester for Session 2023-24 (Summer-2024)**(To be filled in Blue Ink in Capital letters only) Instruction: Please Tick  appropriately and properly)

Name : \_\_\_\_\_ Enrolment No. : \_\_\_\_\_

ID No. : \_\_\_\_\_ Name of Faculty Advisor : \_\_\_\_\_ Contact No. : \_\_\_\_\_

Current Address : \_\_\_\_\_

E-mail : \_\_\_\_\_ Parents Mo. No. : \_\_\_\_\_

**Applicable for Department – CSE (SECTION R), ECE (S), EEE (T), MEC (U)****Physics Stream, II Semester (Summer 2024)**

Sr. No.	Code	Course Title / Name	Course Offered for Department	Type	Credit	Slot	Offered (YES / NO)	Selection
1	AML152	ENGINEERING MECHANICS – 1	CSE / ECE / EEE	ES	4		Offered	Yes / No
2	AMP152	ENGINEERING MECHANICS – 1	CSE / ECE / EEE	ES	1		Offered	Yes / No
3	AML153	ENGINEERING MECHANICS – 2	MEC	ES	4		Offered	Yes / No
4	AMP153	ENGINEERING MECHANICS – 2	MEC	ES	1		Offered	Yes / No
5	HUL101	COMMUNICATION SKILL	CSE / ECE / EEE / MEC	HM	3		Offered	Yes / No
6	MAL101	MATHEMATICS II	CSE / ECE / EEE / MEC	BS	4		Offered	Yes / No
7	MEL103	ENGINEERING DRAWING	CSE / ECE / EEE / MEC	ES	3		Offered	Yes / No
8	MEP103	ENGINEERING DRAWING	CSE / ECE / EEE / MEC	ES	1		Offered	Yes / No
9	PHL102	PHYSICS – 1	CSE / ECE / EEE / MEC	BS	4		Offered	Yes / No
10	PHP102	PHYSICS – 1	CSE / ECE / EEE / MEC	BS	1		Offered	Yes / No
11	SAA101	HEALTH INFORMATION AND SPORTS - II	CSE / ECE / EEE / MEC	AU	0		Offered	Yes / No

\* CSE :- Computer Science Engg., ECE:-Electronics & Communication Engg. ,  
EEE :- Electronics & Electrical Engg, MEC :- Mechanical Engg.

Signature of Student

Signature of Faculty Advisor

Date:

Date:

**Visvesvaraya National Institute of Technology, Nagpur****Registration Form for Enrollment in Even Semester for Session 2023-24 (Summer-2024)**(To be filled in Blue Ink in Capital letters only) Instruction: Please Tick  appropriately and properly)

Name : \_\_\_\_\_ Enrolment No. : \_\_\_\_\_

ID No. : \_\_\_\_\_ Name of Faculty Advisor : \_\_\_\_\_ Contact No. : \_\_\_\_\_

Current Address : \_\_\_\_\_

E-mail : \_\_\_\_\_ Parents Mo. No. : \_\_\_\_\_

**Applicable for Departments – CIV (SECTION W), CME (X), MIN (Y), MME (Z)****Chemistry Stream, II Semester (Summer 2024)**

Sr. No.	Code	Course Title / Name	Course Offered for Department	Type	Credit	SLOT	Offered (YES / NO)	Selection
1	CHL102	CHEMISTRY – 1	CIV / CME / MIN / MME	BS	4		Offered	Yes / No
2	CHP102	CHEMISTRY – 1	CIV / CME / MIN / MME	BS	1		Offered	Yes / No
3	CSL101	COMPUTER PROGRAMMING	CIV / CME / MIN / MME	ES	4		Offered	Yes / No
4	EEL102	ELECTRICAL ENGINEERING – 1	CIV / CME / MIN / MME	ES	4		Offered	Yes / No
5	EEP102	ELECTRICAL ENGINEERING – 1	CIV / CME / MIN / MME	ES	1		Offered	Yes / No
6	HUL102	SOCIAL SCIENCE	CIV / CME / MIN / MME	HM	2		Offered	Yes / No
7	MAL101	MATHEMATICS II	CIV / CME / MIN / MME	BS	4		Offered	Yes / No
8	MEP101	WORKSHOP	CIV / CME / MIN / MME	ES	2		Offered	Yes / No
9	SAA101	HEALTH INFORMATION AND SPORTS - II	CIV / CME / MIN / MME	AU	0		Offered	Yes / No

\* CIV :- Civil Engg., CME:-Chemical Engg. ,  
MIN :- Mining Engg, MME :- Metallurgical & Materials Engg.

Signature of Student

Signature of Faculty Advisor

Date:

Date:



# ACADEMIC CALENDAR



### **Minors in various disciplines (UG only)**

As part of implementation of National Education Policy (NEP-2020), VNIT has introduced minors in various disciplines for the UG students.

A “minor” is a thematic set of courses offered by a department/center for the students of other branches. When a student successfully completes the set, s/he is deemed to have acquired the knowledge related to the theme of the minor. The features and rules of this scheme are as follows.

#### **Features**

1. Minors will be available to the B. Tech. students after the first year of their course.
2. Students from one branch could register at the minor offered by any other department and NOT in the minor offered by their own department.
3. Minor course depth would be set in view of the fact that the students of other branches will be opting for it.
4. For minor, the no. of ‘L’ type courses will be from 4 to 5 and no. of credits will be from 14 to 18.

#### **Rules**

1. A UG student having CGPA of minimum 8.0 and no backlog (W or FF grade) after the first year will be eligible for minor. Registration for minors will be optional for all the eligible students.
2. Students will give preferences and their registration will be conducted as per the merit list prepared for the purpose.
3. Maximum number of students in a minor will be 30 and minimum will be 5. If the number of students interested in a minor is less than 5, whether to run the minor course or not will be at the discretion of the BoS. When the BoS cancels the minor due to less registration, re-allotment of minor will be done, based on the students’ preference, among the remaining minors
4. Minor, once registered, cannot be changed. Also, the student will have to complete the minor along with his/her degree. No separate or additional semesters will be permitted to complete the minor.
5. If a student fails in a course in minor, even in there-exam, repeat registration for the course will not be allowed.
6. Credits registered for minor will be over and above the minimum credits required for award of degree. A student may be permitted to register for maximum 7 no, of ‘L’ type courses and maximum 5 No. of ‘P’ or ‘D’ type courses, to allow registration for minor courses. This facility is available only for minor courses, as minor courses are to be registered over and above the normal registration of the student for his/her UG branch. Other rules in clause 4.4 of the Academic Rule Book continue to be in force.
7. CGPA for minors will be calculated separately, independent of that calculated for award of degree.
8. Minor will be mentioned with CGPA in the degree, only if the student completes all the prescribed courses in a minor.





**Minors offered by the various departments**

Dept.	Minors and their courses		
	I	II	III
<b>CIV</b>	<b>Infrastructure Engineering and Management:</b> <ol style="list-style-type: none"> <li>1. Infrastructure Planning and Management[3-0-0]</li> <li>2. Transportation Infrastructure Planning and Design[3-0-0]</li> <li>3. Water Resources Infrastructures[3-0-0]</li> <li>4. Geotechnical Aspects of Infrastructures[3-0-0]</li> <li>5. Environmental Sustainability and Infrastructure[3-0-0]</li> </ol>		
<b>CME</b>	No information available		
<b>CSE</b>	<ol style="list-style-type: none"> <li>1. Computer Systems and Engineering[3-1-0]</li> <li>2. Data Structures and Programming[3-0-2]</li> <li>3. Algorithm Design Techniques[3-1-0]</li> <li>4. Web development with 3 layered architecture[3-0-2]</li> </ol>		
<b>ECE</b>	<b>Internet of Things ( IoT):</b> <ol style="list-style-type: none"> <li>1. Concepts of Communication [3-0-2]</li> <li>2. Communication Networks for IoT [3-0-2]</li> <li>3. IoT Design [3-0-2]</li> <li>4. Advanced Topics in IoT [3-0-2]</li> <li>5. IoT based Mini Project [0-0-4]</li> </ol>		
<b>EEE</b>	<b>Electric Vehicles:</b> <ol style="list-style-type: none"> <li>1. Fundamentals of Circuit and Systems [3-0-0]</li> <li>2. Fundamentals of Control and Power Electronics[3-0-0]</li> <li>3. Fundamentals of Traction Drives for Electric Vehicles[3-0-0]</li> <li>4. Design of Electric Vehicle System[3-0-2]</li> <li>5. Electric Vehicle Charging and Grid Interaction[3-0-2]</li> </ol>	<b>Specialization in Smart Grid Technology:</b> <ol style="list-style-type: none"> <li>1. Basic Electrical Engineering [3-0-0]</li> <li>2. Power Electronic Converters[3-0-0]</li> <li>3. Control &amp; Automation[3-0-0]</li> <li>4. Renewable Energy Sources and Storage System[3-0-2]</li> <li>5. Smart Grid Technology[3-0-2]</li> </ol>	
<b>MEC</b>	<b>Robotics:</b> <ol style="list-style-type: none"> <li>1. Mechanisms and Robot Kinematics [3-0-0]</li> <li>2. Mobile Robotics*[3-0-0]</li> <li>3. Aerial Robotics*[3-0-0]</li> <li>4. Vision for robotics[3-0-0]</li> <li>5. Robotics Lab 1*[0-0-2]</li> <li>6. Robotics Lab 2*[0-0-2]</li> </ol>		
<b>MIN</b>	No information available		



<p><b>MME</b></p>	<p><b>Materials Engineering:</b></p> <ol style="list-style-type: none"> <li>1. Introduction to Materials Science and Engineering [3-0-0],</li> <li>2. Structural and Mechanical Characterization of Materials [3-0-2],</li> <li>3. Processing of Materials [3-0-2],</li> <li>4. Elements of ceramic, polymeric and composite materials [3-0-0],</li> <li>5. Speciality Materials[3-0-0],</li> </ol>		
<p><b>CHM</b></p>	<p><b>Biochemical and biomedical techniques :</b></p> <ol style="list-style-type: none"> <li>1. Molecules that changed the world [3-0-0],</li> <li>2. Introduction to Molecular Biology [3-0-1],</li> <li>3. Biochemical Application Transition Metals and Lanthanides [3-0-0],</li> <li>4. Biomedical Technologies and Imaging [3-0-0],</li> <li>5. Bioorganic and Medicinal Chemistry [3-0-0]</li> </ol>	<p><b>Advances In Materials Chemistry:</b></p> <ol style="list-style-type: none"> <li>1. Functional Materials [3-0-0],</li> <li>2. Advances in Energy Storage and Fuel Technology [3-0-0],</li> <li>3. Materials Characterization Techniques and Lab [3-0-1],</li> <li>4. Chemistry of Engineering Materials [3-0-0],</li> <li>5. Solid State Chemistry of Materials [3-0-0]</li> </ol>	<p><b>Chemical Analysis &amp; Spectroscopic Methods for Engineering applications:</b></p> <ol style="list-style-type: none"> <li>1. Electroanalytical and instrumental analysis [3-0-0],</li> <li>2. Spectroscopy for Engineering Applications [3-0-0],</li> <li>3. Characterization Techniques and Lab [3-0-1],</li> <li>4. Detectors and Sensors [3-0-0],</li> <li>5. Data Analysis and Technical Writing [3-0-1]</li> </ol>



**Slots for First Semester B. Tech. (Aug-2023 to Dec-2023)**

Section →	CIV	CME	MIN	MME	Section →	CSE	ECE	EEE	MEC	Exam
Course ↓	Slots				Course ↓	Slots				
Math I (MA)	<b>B</b>	<b>A</b>	<b>F</b>	<b>H</b>	Math I (MA)	<b>C</b>	<b>A</b>	<b>B</b>	<b>D</b>	Day 1
Physics (PH)	<b>C</b>	<b>E</b>	<b>A</b>	<b>G</b>	Chemistry (CH)	<b>G</b>	<b>H</b>	<b>A</b>	<b>G</b>	Day 2
Engineering Mechanics (EM)	<b>A</b>	<b>C</b>	<b>E</b>	<b>B</b>	Electrical Engineering (EE)	<b>B</b>	<b>F</b>	<b>E</b>	<b>H</b>	Day 3
Communication Skill (CS)	<b>H</b>	<b>F</b>	<b>G</b>	<b>C</b>	Computer Programming (CP)	<b>A</b>	<b>E</b>	<b>F</b>	<b>B</b>	Day 4
Engineering Drawing (ED)	<b>G</b>	<b>D</b>	<b>H</b>	<b>D</b>	Social Science (SS)	<b>H</b>	<b>G</b>	<b>D</b>	<b>C</b>	Day 5



**Slots for First Semester B. Tech. (Jan-2024 to April-2024)**

Section →	CSE	ECE	EEE	MEC	Section →	CIV	CME	MIN	MME	Exam
<i>Course</i> ↓	<i>Slots</i>				<i>Course</i> ↓	<i>Slots</i>				
Math II (MA)	<b>B</b>	<b>A</b>	<b>F</b>	<b>H</b>	Math II (MA)	<b>C</b>	<b>A</b>	<b>B</b>	<b>D</b>	<b>Day 1</b>
Physics (PH)	<b>C</b>	<b>E</b>	<b>A</b>	<b>G</b>	Chemistry (CH)	<b>G</b>	<b>H</b>	<b>A</b>	<b>G</b>	<b>Day 2</b>
Engineering Mechanics (EM)	<b>A</b>	<b>C</b>	<b>E</b>	<b>B</b>	Electrical Engineering (EE)	<b>B</b>	<b>F</b>	<b>E</b>	<b>H</b>	<b>Day 3</b>
Communication Skill (CS)	<b>H</b>	<b>F</b>	<b>G</b>	<b>C</b>	Computer Programming (CP)	<b>A</b>	<b>E</b>	<b>F</b>	<b>B</b>	<b>Day 4</b>
Engineering Drawing (ED)	<b>G</b>	<b>D</b>	<b>H</b>	<b>D</b>	Social Science (SS)	<b>H</b>	<b>G</b>	<b>D</b>	<b>C</b>	<b>Day 5</b>

**Batch for practical and tutorial**

All the sections of various programs except Mining Engineering (MIN) are divided into 4 batches of 30 students. For the section of MIN, it's divided into 2 batches. Thus practical / tutorial batches will be as follows.

Sr. No.	Batch of Practical / Tutorial	Enrollment No	
		From	To
1.	P <sub>1</sub> / T <sub>1</sub>	BT23xxx001	BT23xxx030
2.	P <sub>2</sub> / T <sub>2</sub>	BT23xxx031	BT23xxx060
3.	P <sub>3</sub> / T <sub>3</sub>	BT23xxx061	BT23xxx090
4.	P <sub>4</sub> / T <sub>4</sub>	BT23xxx091	BT23xxx120 and above

For e.g. a section of Computer Science and Engineering (CSE) program, the P<sub>1</sub> batch for practical / T<sub>1</sub> tutorial shall be BT23CSE001 to BT23CSE030

If a department splits a section into two, they must ensure that the practical / tutorial batches remain as four.



### Slot wise Time Table

	1	2	3	4	5	6	7	8	9	10
<b>Time</b>	<b>8:00 to</b>	<b>9:00 to</b>	<b>10:00 to</b>	<b>11:00 to</b>	<b>12:00 to</b>	<b>1:00 to</b>	<b>2:00 to</b>	<b>3:00 to</b>	<b>4:00 to</b>	<b>5:00 to</b>
<b>Day</b>	<b>8:55 am</b>	<b>9:55 am</b>	<b>10:55 am</b>	<b>11:55 am</b>	<b>12:55 pm</b>	<b>1:55 pm</b>	<b>2:55 pm</b>	<b>3:55 pm</b>	<b>4:55 pm</b>	<b>5:55 pm</b>
<b>MON</b>	<b>Slots for Practical and Tutorials</b>				<b>LUNCH BREAK</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>H</b>	<b>G</b>
<b>TUE</b>						<b>A</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>WED</b>						<b>D</b>	<b>A</b>	<b>B</b>	<b>E</b>	<b>F</b>
<b>THU</b>						<b>B</b>	<b>G</b>	<b>H</b>	<b>C</b>	<b>D</b>
<b>FRI</b>						<b>A</b>	<b>G</b>	<b>H</b>	<b>F</b>	<b>E</b>
<b>SAT</b>	<b>Refer academic calendar to follow time table of a specific day</b>									



First Year B. Tech. (Winter 2023-24)

Time Table for CSE(R), ECE(S), EEE(T), MEC(U) Sections (Chemistry Stream)

Day	Section
Monday	CSE
	ECE
	EEE
	MEC
Tuesday	CSE
	ECE
	EEE
	MEC
Wednesday	CSE
	ECE
	EEE
	MEC
Thursday	CSE
	ECE
	EEE
	MEC
Friday	CSE
	ECE
	EEE
	MEC

1 8.00 -8.55 am	2 9.00 - 9.55 am	3 10.00 - 10.55 am	4 11.00 -11.55 am
CH_P1, CP_P2, EE_P3, WS_P4			
		CH_T1, EE_T2, MA_T3	
CH_P1, CP_P2, EE_P3, WS_P4			
CH_P2, CP_P3, EE_P4, WS_P1		CH_T2, EE_T3, MA_T4	
WS_P1, WS_P2		WS_P3, WS_P4	
WS_P1, WS_P2		WS_P3, WS_P4	
		CH_P3, CP_P4, EE_P1, WS_P2	
CH_P3, CP_P4, EE_P1, WS_P2			
	CH_T2, EE_T3, MA_T4	CH_T3, EE_T4, MA_T1	
CH_P3, CP_P4, EE_P1, WS_P2			
WS_P1, WS_P2		WS_P3, WS_P4	
SP		CH_T3, EE_T4, MA_T1	
CH_P3, CP_P4, EE_P1, WS_P2			
	CH_T3, EE_T4, MA_T1		
		CH_P4, CP_P1, EE_P2, WS_P3	
WS_P1, WS_P2		WS_P3, WS_P4	
CH_P4, CP_P1, EE_P2, WS_P3			

	5 1.00 -1.55 pm	6 2.00 - 2.55 pm	7 3.00 - 3.55 pm	8 4.00 - 4.55 pm	9 5.00 - 5.55 pm	
Break	MA	CP	EE	SS	CH	
	CH_P1, CP_P2, EE_P3, WS_P4		CH_T1, EE_T2, MA_T3	CH		
	CH_T2, EE_T3, MA_T4	CH	MA	CH_P1, CP_P2, EE_P3, WS_P4		
			CP	EE	CH	
	CP	MA	CH_T1, EE_T2, MA_T3	CH_P2, CP_P3, EE_P4, WS_P1		
	MA	CH_T3, EE_T4, MA_T1		CP	EE	
	CH_P2, CP_P3, EE_P4, WS_P1		SS	EE	CP	
	CH_T1, EE_T2, MA_T3	SS	MA	SP		
	CH_T2, EE_T3, MA_T4	CP	EE	SP		
			MA	CH_T4, EE_T1, MA_T2	CP	EE
	SS	CH	MA	EE	CP	
	MA			CP	CH_P2, CP_P3, EE_P4, WS_P1	
EE	CH	SS	MA			
		SS	CH	SP		
MA	CH_T4, EE_T1, MA_T2			CH_P4, CP_P1, EE_P2, WS_P3		
CP	CH	EE	SS	MA		
		CH	CH_T4, EE_T1, MA_T2	CH_P4, CP_P1, EE_P2, WS_P3		
MA	SS	CH	EE	CP		
CH			CP	EE		
		CH	EE	CH_T4, EE_T1, MA_T2		

Student shall attend classes as per their section

**Abbreviation for**

**Courses:**

CH- Chemistry  
 MA-Mathematics-I  
 EE- Electrical Engineering  
 CP- Computer Programming  
 SS- Social Science  
 SP-Sports  
 WS-Work Shop

**Room No:**

Section ECE: CRC 2-1  
 Section CSE: CRC 2-2  
 Section EEE: CRC 2-3  
 Section MEC: CRC 2-4

**For Lab :** Respective Department

**For Tutorial :**

MA : CRC-0-1  
 CH : CHE 003 ( Dept. of Chem. Engg)  
 EE : CHE 203 ( Dept. of Chem. Engg)

**Each section is divided into 4 batches for Lab/tutorial.**

CH\_P1 is Chemistry lab for 1<sup>st</sup> Batch

EE\_T2 is Electrical Engg. tutorial for Batch 2

\* Class can be shifted to 5<sup>th</sup> and 6<sup>th</sup> floor in case bigger green board is required.



First Year B. Tech. (Winter 2023-24)

Time Table for CIV(W), CME(X), MIN(Y), MME(Z) Sections (Physics Stream)

Day	Section
Monday	CIV
	CME
	MIN
	MME
Tuesday	CIV
	CME
	MIN
	MME
Wednesday	CIV
	CME
	MIN
	MME
Thursday	CIV
	CME
	MIN
	MME
Friday	CIV
	CME
	MIN
	MME

1	2	3	4
8.00 - 8.55 am	9.00 - 9.55 am	10.00 - 10.55 am	11.00 - 11.55 am
CS_P1, ED_P2, EM_P3, PH_P4			
		CS_P1, ED_P2, EM_P3, PH_P4	
	EM_T1, MA_T2, PH_T3		EM_T2, MA_T3, PH_T4
CS_P2, ED_P3, EM_P4, PH_P1			
	EM_T1, MA_T2, PH_T3		
		EM_T3, MA_T4, PH_T1	
			EM_T1, MA_T2, PH_T3
CS_P2, ED_P3, EM_P4, PH_P1			
		CS_P3, ED_P4, EM_P1, PH_P2	
	EM_T2, MA_T3, PH_T4	EM_T3, MA_T4, PH_T1	
		CS_P3, ED_P4, EM_P1, PH_P2	
CS_P4, ED_P1, EM_P2, PH_P3			
CS_P4, ED_P1, EM_P2, PH_P3			
			EM_T3, MA_T4, PH_T1
CS_P4, ED_P1, EM_P2, PH_P3			
		EM_T4, MA_T1, PH_T2	

5	6	7	8	9
1.00 - 1.55 pm	2.00 - 2.55 pm	3.00 - 3.55 pm	4.00 - 4.55 pm	5.00 - 5.55 pm
PH	EM	MA	CS	ED
EM	MA	SP		
	EM_T1, MA_T2, PH_T3		ED	EM_T2, MA_T3, PH_T4
CS_P1, ED_P2, EM_P3, PH_P4		EM	MA	PH
EM	PH	SP		
MA	EM	ED	PH	
PH	CS_P1, ED_P2, EM_P3, PH_P4		EM	MA
	CS	ED	CS_P2, ED_P3, EM_P4, PH_P1	
	EM	MA	CS_P3, ED_P4, EM_P1, PH_P2	
ED	CS_P2, ED_P3, EM_P4, PH_P1		PH	CS
	PH		EM	MA
ED	EM_T3, MA_T4, PH_T1	EM	SP	
MA	ED	CS	PH	
CS_P3, ED_P4, EM_P1, PH_P2		EM_T2, MA_T3, PH_T4	EM	ED
EM_T4, MA_T1, PH_T2	CS	ED	SP	
EM	PH	MA	CS	ED
EM_T4, MA_T1, PH_T2	ED	CS_P4, ED_P1, EM_P2, PH_P3		
MA	EM_T4, MA_T1, PH_T2		CS	PH
PH	CS	ED	MA	EM
	PH	MA		

Student shall attend classes as per their section

**Abbreviation for Courses:**  
 PH- Physics,  
 MA-Mathematics-I,  
 EM-Engineering Mechanics,  
 ED- Engineering Drawing,  
 CS- Communication Skills,  
 SP- Sports

**Room No: ( For Theory)**  
 Section CIV: CRC 1-1  
 Section CME: CRC 1-2  
 Section MIN: CRC 1-4  
 Section MME: CRC 1-3

**For Lab :** Respective Department

**For Tutorial :**  
 MA : CRC-0-1  
 PH : CHE 003 ( Dept. of Chem. Engg)  
 EM : CHE 203 ( Dept. of Chem. Engg)

Each section is divided into four batches for Lab/tutorial.  
 PH\_P1 is Physics lab for 1<sup>st</sup> Batch

EM\_T2 is Engg. Mechanics tutorial for Batch 2

\* Class can be shifted to 5<sup>th</sup> and 6<sup>th</sup> floor in case bigger green board is required.





First Year B. Tech. (Summer 2023-24)

Time Table for CIV(W), CME(X), MIN(Y), MME(Z) Sections (Chemistry Stream)

Day	Section	1	2	3	4
		8.00 -8.55 am	9.00 - 9.55 am	10.00 - 10.55 am	11.00 -11.55 am
Monday	CIV	CH_P1, CP_P2, EE_P3, WS_P4			
	CME				
	MIN			CH_T1, EE_T2, MA_T3	
	MME	CH_P1, CP_P2, EE_P3, WS_P4			
Tuesday	CIV				
	CME	CH_P2, CP_P3, EE_P4, WS_P1			CH_T2, EE_T3, MA_T4
	MIN				
	MME	WS_P1, WS_P2		WS_P3, WS_P4	
Wednesday	CIV	WS_P1, WS_P2		WS_P3, WS_P4	
	CME	CH_P3, CP_P4, EE_P1, WS_P2			
	MIN	CH_P3, CP_P4, EE_P1, WS_P2			
	MME		CH_T2, EE_T3, MA_T4	CH_T3, EE_T4, MA_T1	
Thursday	CIV	CH_P3, CP_P4, EE_P1, WS_P2			
	CME	WS_P1, WS_P2		WS_P3, WS_P4	
	MIN	SP			CH_T3, EE_T4, MA_T1
	MME	CH_P3, CP_P4, EE_P1, WS_P2			
Friday	CIV		CH_T3, EE_T4, MA_T1		
	CME	CH_P4, CP_P1, EE_P2, WS_P3			
	MIN	WS_P1, WS_P2		WS_P3, WS_P4	
	MME	CH_P4, CP_P1, EE_P2, WS_P3			

	5	6	7	8	9
	1.00 -1.55 pm	2.00 - 2.55 pm	3.00 - 3.55 pm	4.00 - 4.55 pm	5.00 - 5.55 pm
Break	MA	CP	EE	SS	CH
	CH_P1, CP_P2, EE_P3, WS_P4		CH_T1, EE_T2, MA_T3	CH	
	CH_T2, EE_T3, MA_T4	CH	MA	CH_P1, CP_P2, EE_P3, WS_P4	
			CP	EE	CH
	CP	MA	CH_T1, EE_T2, MA_T3	CH_P2, CP_P3, EE_P4, WS_P1	
	MA	CH_T3, EE_T4, MA_T1		CP	EE
	CH_P2, CP_P3, EE_P4, WS_P1		SS	EE	CP
	CH_T1, EE_T2, MA_T3	SS	MA	SP	
	CH_T2, EE_T3, MA_T4	CP	EE	SP	
			MA	CP	EE
	SS	CH	MA	EE	CP
	MA	CP		CH_P2, CP_P3, EE_P4, WS_P1	
	EE	CH	SS	MA	
			SS	CH	SP
	MA	CH_T4, EE_T1, MA_T2			CH_P4, CP_P1, EE_P2, WS_P3
	CP	CH	EE	SS	MA
Lunch			CH	CH_T4, EE_T1, MA_T2	CH_P4, CP_P1, EE_P2, WS_P3
	MA	SS	CH	EE	CP
	CH			CP	EE
			CH	EE	CH_T4, EE_T1, MA_T2

Student shall attend classes as per their section

**Abbreviation for Courses:**

- CH- Chemistry
- MA-Mathematics-II
- EE- Electrical Engineering
- CP- Computer Programming
- SS- Social Science
- SP-Sports
- WS-Work Shop

**Room No:**

- Section CIV: CRC 1-1
- Section CME: CRC 1-2
- Section MIN: CRC 1-4
- Section MME: CRC 1-3

**For Lab :** Respective Department

**For Tutorial :**

- MA : CRC-0-1
- CH : CHE 003 ( Dept. of Chem. Engg)
- EE : CHE 203 ( Dept. of Chem. Engg)

Each section is divided into 4 batches for Lab/tutorial. CH\_P1 is Chemistry lab for 1<sup>st</sup> Batch

EE\_T2 is Electrical Engg. tutorial for Batch 2

\* Class can be shifted to 5<sup>th</sup> and 6<sup>th</sup> floor in case bigger green board is required.



**First Year B. Tech. (Summer 2023-24)**  
**Time Table for CSE(R), ECE(S), EEE(T), MEC(U) Sections (Physics Stream)**

Day	Section
Monday	CSE
	ECE
	EEE
	MEC
Tuesday	CSE
	ECE
	EEE
	MEC
Wednesday	CSE
	ECE
	EEE
	MEC
Thursday	CSE
	ECE
	EEE
	MEC
Friday	CSE
	ECE
	EEE
	MEC

1	2	3	4
8.00 - 8.55 am	9.00 - 9.55 am	10.00 - 10.55 am	11.00 - 11.55 am
CS_P1, ED_P2, EM_P3, PH_P4			
		CS_P1, ED_P2, EM_P3, PH_P4	
	EM_T1, MA_T2, PH_T3		EM_T2, MA_T3, PH_T4
		CS_P2, ED_P3, EM_P4, PH_P1	
	EM_T1, MA_T2, PH_T3		
		EM_T3, MA_T4, PH_T1	
			EM_T1, MA_T2, PH_T3
CS_P2, ED_P3, EM_P4, PH_P1			
		CS_P3, ED_P4, EM_P1, PH_P2	
	EM_T2, MA_T3, PH_T4	EM_T3, MA_T4, PH_T1	
		CS_P3, ED_P4, EM_P1, PH_P2	
CS_P4, ED_P1, EM_P2, PH_P3			
CS_P4, ED_P1, EM_P2, PH_P3			EM_T3, MA_T4, PH_T1
		CS_P4, ED_P1, EM_P2, PH_P3	
		EM_T4, MA_T1, PH_T2	

5	6	7	8	9
1.00 - 1.55 pm	2.00 - 2.55 pm	3.00 - 3.55 pm	4.00 - 4.55 pm	5.00 - 5.55 pm
PH	EM	MA	CS	ED
EM	MA		SP	
	EM_T1, MA_T2, PH_T3		ED	EM_T2, MA_T3, PH_T4
CS_P1, ED_P2, EM_P3, PH_P4		EM	MA	PH
EM	PH		SP	
MA	EM	ED	PH	
PH	CS_P1, ED_P2, EM_P3, PH_P4		EM	MA
	CS	ED	CS_P2, ED_P3, EM_P4, PH_P1	
	EM	MA	CS_P3, ED_P4, EM_P1, PH_P2	
ED	CS_P2, ED_P3, EM_P4, PH_P1		PH	CS
	PH		EM	MA
ED	EM_T3, MA_T4, PH_T1	EM	SP	
MA	ED	CS	PH	
CS_P3, ED_P4, EM_P1, PH_P2		EM_T2, MA_T3, PH_T4	EM	ED
EM_T4, MA_T1, PH_T2	CS	ED	SP	
EM	PH	MA	CS	ED
EM_T4, MA_T1, PH_T2	ED		CS_P4, ED_P1, EM_P2, PH_P3	
MA	EM_T4, MA_T1, PH_T2		CS	PH
PH	CS	ED	MA	EM
	PH	MA		

Student shall attend classes as per their section

**Abbreviation for Courses:**  
 PH- Physics,  
 MA-Mathematics-II,  
 EM-Engineering Mechanics,  
 ED- Engineering Drawing,  
 CS- Communication Skills,  
 SP- Sports

**Room No: ( For Theory)**

Section ECE: CRC 2-1  
 Section CSE: CRC 2-2  
 Section EEE: CRC 2-3  
 Section MEC: CRC 2-4

**For Lab : Respective Department**

**For Tutorial :**  
 MA : CRC-0-1  
 PH : CHE 003 ( Dept. of Chem. Engg)  
 EM : CHE 203 ( Dept. of Chem. Engg)

Each section is divided into four batches for Lab/tutorial. PH\_P1 is Physics lab for 1<sup>st</sup> Batch

EM\_T2 is Engg. Mechanics tutorial for Batch 2

\* Class can be shifted to 5<sup>th</sup> and 6<sup>th</sup> floor in case bigger green board is required.



## List of Faculty Mentors for First Year B. Tech. (2023-2024)

S.N.	Name of Faculty Mentor	Dept. of Faculty Mentor	Batch Assigned	Contact No	Email ID
1	Dr. M. D. Goel	Applied Mechanics	X3 & X4	2801419 7722043252	<a href="mailto:mdgoel@apm.vnit.ac.in">mdgoel@apm.vnit.ac.in</a>
2	Dr. Abhishek Banerjee	Chemistry	R3 & R4	2801884 853988181	<a href="mailto:abhishekbanerjee@chm.vnit.ac.in">abhishekbanerjee@chm.vnit.ac.in</a>
3	Dr. Gayatri Laxmi	Chemistry	Y1 & Y2	2801778 9420407446	<a href="mailto:laxmigayatri@chm.vnit.ac.in">laxmigayatri@chm.vnit.ac.in</a>
4	Dr. G. N. Nimbarte	Humanities	U3 & U4	2801435 9373045542	<a href="mailto:gnimbarte@hss.vnit.ac.in">gnimbarte@hss.vnit.ac.in</a>
5	Dr. Jaipal	Humanities	T3 & T4	2801921 9030704237	<a href="mailto:jaipal@hss.vnit.ac.in">jaipal@hss.vnit.ac.in</a>
6	Dr. M. N. Paikane	Humanities	S1 & S2	2801352 8888276777	<a href="mailto:maithilipaikane@hss.vnit.ac.in">maithilipaikane@hss.vnit.ac.in</a>
7	Dr. B. Dash	Humanities	Z3 & Z4	2802248 9438322472	<a href="mailto:bibhudattadash@hss.vnit.ac.in">bibhudattadash@hss.vnit.ac.in</a>
8	Dr. Pallavi Mahale	Mathematics	T1 & T2	2801406 9965232769	<a href="mailto:pmahale@mth.vnit.ac.in">pmahale@mth.vnit.ac.in</a>
9	Dr. Sourabh Pradhan	Mathematics	U1 & U2	2801448 8145994809	<a href="mailto:spradhan@mth.vnit.ac.in">spradhan@mth.vnit.ac.in</a>
10	Dr. Vishnu Pratap Singh	Mathematics	R1 & R2	2801447 7983881146	<a href="mailto:vpsingh@mth.vnit.ac.in">vpsingh@mth.vnit.ac.in</a>
11	Dr. Vijendra Nallapu	Mathematics	S3 & S4	2801411 9677021954	<a href="mailto:vijendernallapu@mth.vnit.ac.in">vijendernallapu@mth.vnit.ac.in</a>
12	Dr. Sourav Bhattacharya	Mathematics	W3 & W4	2801450 9875556368	<a href="mailto:souravbhattacharya@mth.vnit.ac.in">souravbhattacharya@mth.vnit.ac.in</a>
13	Dr. M. S. Ramkarthik	Physics	X1 & X2	2801835 9168720324	<a href="mailto:msramkarthik@phy.vnit.ac.in">msramkarthik@phy.vnit.ac.in</a>
14	Dr. U. T. Bhosale	Physics	Z1 & Z2	<b>2802294</b> 9884754249 / 8378025618	<a href="mailto:udaysinhbhosale@phy.vnit.ac.in">udaysinhbhosale@phy.vnit.ac.in</a>
15	Dr. Sayandip Ghosh	Physics	W1 & W2	<b>2802343</b> <b>7063749424</b>	<a href="mailto:sayandipghosh@phy.vnit.ac.in">sayandipghosh@phy.vnit.ac.in</a>



## List of Faculty Coordinators (FC) and Student Mentors (SM) for the Batch 2023-24

Dept.	F. C.	Contact Details	Student Mentor	Contact details	Email
Arch	Dr. Rakesh Parmar	2331	<b>Sraddha Madhusoodanan</b>	<b>7356917752</b>	<b>sraddha.madhus@gmail.com</b>
		8002283655	Adithya H Nair	9319733661	adityahwire@gmail.com
			Dhage Arya Rohidas	9665783041	aryadhage2003@gmail.com
			Revati Rajesh Ramteke	8080427936	ramtekerevati@gmail.com
			Gokul R Varma	9496521841	gokul.ravi.varma2002@gmail.com
			Ruhi Deshmukh	9764333877	deshmukhruhi11@gmail.com
CME	Dr. Sonali P. Tajane (Hiwarkar)	1569	<b>Varad Parag Dabir</b>	<b>9867944748</b>	<b>varad.dabir@gmail.com</b>
		7387838538	Krunal Govind Mahesh Putta	8999575930	krunal.putta999@gmail.com
			Himanshu Sanjay Shrote	9673196949	himanshushrote18@gmail.com
			Nisarg Ravindra Kokare	9067238418	nisargkokare9@gmail.com
			Koustubh Umesh Kulkarni	9511847577	koustubhukulkarni@gmail.com
			Gaurav Raj	6202800487	gauravkrraj16@gmail.com
			Rutuja Deepak Pathak	7559303424	suatapatthak888@gmail.com
			Boda Anusha	7993463807	anushaboda2004@gmail.com
CIV	Dr. Vaidehi Dakwale	2256	Abhishek Kumar Pandey	9628965488	abhishekpandeydad1@gmail.com
		9423109310	<b>Atharv Sudhakar Bhandare</b>	<b>7558620895</b>	<b>atharv.bhandare1609@gmail.com</b>
			Elikanti Rishitha	9121645876	rishithaelikanti@gmail.com
			Harshpreet Singh Malhi	8225056170	malhiharshpreetsingh@gmail.com
			Mutnuru Venkata Surya Abhi Ram	8309528382	ab.279v@gmail.com
			Pranjal Asati	7747019475	asatipranjal1990@gmail.com
			Shubham Santosh Tengale	9373796467	shubhamtengale@gmail.com
			TVS Lalitha Vaishnavi	8978079701	lalithavaishnavi686@gmail.com
CSE	Poonam Sharma	1596	Anushka Thumiki	9063001893	anushkathumiki@gmail.com
		9826090830	Devansh Negi	7895900765	devansh3839@gmail.com
			Phirke Hardik Anant	9867239393	hardikphirke@gmail.com
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			Kondra Nagabhavani	8247261722	bhavanikondra01@gmail.com
EEE	Dr. Krishnama Raju S	2228	<b>Anisha Singh</b>	<b>9117998309</b>	<b>anishavashisth04@gmail.com</b>
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			Vaidehi Menon	9967021113	vaidehi1763@gmail.com
			Unnati Dhut	7558541377	unnatidhut17@gmail.com
			Karnik Avishkar Rajesh	9172253991	avishkarkarnik28@gmail.com
			Shivam Choudhari	9225567333	choudharishivam28@gmail.com
ECE	Dr. K. Surender	1025	<b>Sankarnarayan Chandrasekhar</b>	<b>8600194615</b>	<b>shankarthik3006@gmail.com</b>
		8879538369	Patil Anshul Mansaram	9423680662	bt21ece069@students.vnit.ac.in
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			Yatharth Suneel	6306728556	suneelyatharth@gmail.com
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			Anurag Sahu	7877976137	anurag2003sahu@gmail.com
			Peduri Nigamanvesh	7095750388	nigamanvesh2004@gmail.com
MEC	Dr. Ravikumar Dumpala	1151	Avinash Gautam	7909934103	avinashkumargautam999@gmail.com
		7219574566	Farzeen Anzar	7045695462	farzeenanzar2002@gmail.com
			Swarali Hirurkar	7718065825	swaralih013@gmail.com
			<b>Anjali Mary Joyce</b>	<b>9896007363</b>	<b>anjali mary29@gmail.com</b>
			Priyans Singh	9821194391	priyansingh2001@gmail.com
			Avani Dandige	9561740352	avanidandige@gmail.com
			Ankit Kumar Soni	9334780063	soniankit49064@gmail.com
Jayesh Sanjay Damakale	7798090738	damakalejayesh12@gmail.com			
MME	Dr. Avishkar B. Rathod	2298	Riddhi Badgujar	9004364890	riddhibadgujar@gmail.com
		7032303561	Kshitij Gajanan Raut	7038342122	rautgajanan13@gmail.com
			Pranav Pawar	9763618635	pranavpawar12@gmail.com



Course Book First Year B. Tech. (2023-2024)

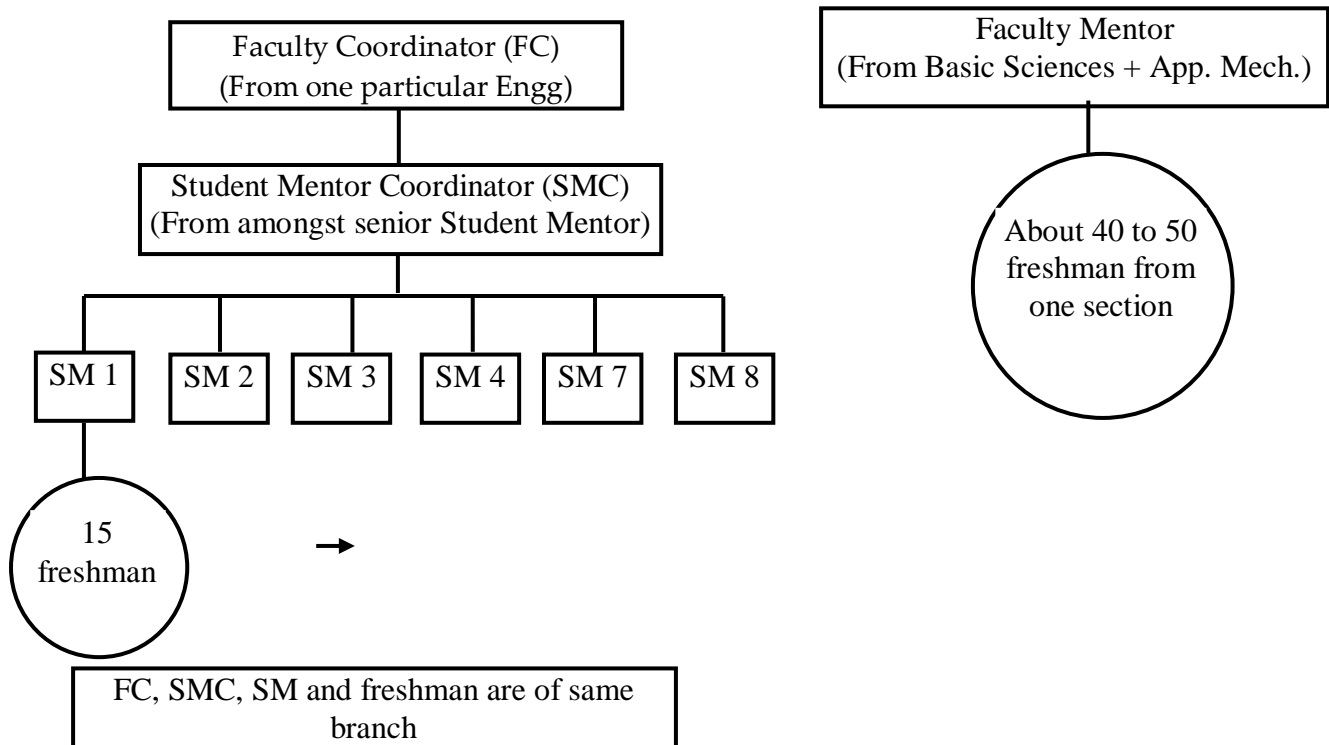
Dept.	F. C.	Contact Details	Student Mentor	Contact details	Email
			Ujjwal Sahu	9335003125	ujjwalsahu0302@gmail.com
			Piyush Sarda	6381018338	bt21mme065@students.vnit.ac.in
			Saumya Sushil More	7083366699	saumyamorey3071@gmail.com
			Shivam Gandhile	7841083300	gandhileshivam@gmail.com
			Sharan Shetty	7378888510	bt21mme017@students.vnit.ac.in
MIN	Dr. Nikhil Sirdesai	2271	Mohammad Zaid	9130350421	mzaidias2025@gmail.com
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			Thakur Ankitkumar	9321215289	ankitthakur2002.at@gmail.com
			Kishori Rajurkar	9075159739	rajurkarkishori.7515@gmail.com

**ABOUT STUDENT MENTOR PROGRAM (SMP)**

The Student Mentor Program (SMP) is a program within the VNIT, Nagpur student community, with the following primary objectives of:

1. Enabling constructive interaction, guidance and mentorship of junior students by senior students.
2. Providing a reliable and comprehensive support system to motivate students to excel in both academic and non-academic fields and to make the most of their life at the Institute

The two way system is devised to help freshman to be at ease with the new environment of VNIT. In this system a group of 15 mentees (freshman) of a particular branch are allotted a Student Mentor (SM) of the same branch. At the same time, one of the teachers, who is teaching a particular section is made Faculty Mentor of about 40 students of that section. This scheme is given below:



**Scheme of SMP**



## OTHER INFORMATION

Director

Dr. P. M. Padole  
0712 280 1370, 2223969 (Fax)  
[director@vnit.ac.in](mailto:director@vnit.ac.in)

Warden HB-6

Dr. R. P. Vijay Kumar  
0712 2801782, 1679  
9970335592

Dean (Academic)

Dr. A. S. Gandhi  
0712 2801301  
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Warden HB-6

Dr. Nikhil Deep Gupta  
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9358190782

Dean (Faculty Welfare)

Dr. R. R. Yerpude  
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Warden HB-7

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880621888

Dean (Planning & Development)

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Warden GH-1

Dr. Deepti Shrimankar  
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9860606477

Dean (Research & Consultancy)

Dr. (Smt.) M. A. Chaudhari  
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Warden GH-1

Dr. Purnima Satapathy  
0712 2801910  
7584961168

Dean (Student Welfare)

Dr. D. H. Lataye  
0712 2801320  
[deanstd\\_coun@vnit.ac.in](mailto:deanstd_coun@vnit.ac.in)

Associate Dean (Hostel Affairs)

Dr. Ratnesh Kumar  
0712 2801119  
[associatedeanha@vnit.ac.in](mailto:associatedeanha@vnit.ac.in)

Dy. Registrar (Acad & Exam)

Mr. Nikhil Chingalwar  
0712 2801365  
[dr\\_acd@vnit.ac.in](mailto:dr_acd@vnit.ac.in)

Asstt. Registrar (Hostel) I/c

Mrs. Deepali Deshpande  
0712 2801373  
[hostelmanager@vnit.ac.in](mailto:hostelmanager@vnit.ac.in)

Medical Officer

Dr. Pankaj Dhule  
**0712-2801342**  
9422104694  
[medicalofficer@vnit.ac.in](mailto:medicalofficer@vnit.ac.in)

Account Section	0712 2801242
Academic Section	0712 2801241
Examination Cell	0712 2801278
T & P	0712 2801258
Security Section	0712 2801222
Hostel Section	0712 2801233
Guest House	0712 2801221
Health Center	0712 2801342
Physical Education	0712 2801232

### For Student's Medical Emergency

**Ambulance: 862 305 6246**

**CIIMS HOSPITAL**, Bajaj 2Nagar, NAGPUR,

Phone No: - 2236441/2237662

**WOCKHARDT HOSPITAL**

27, Corporation Colony, Near Shankar Nagar Square, North

Ambhazari Road, NAGPUR.

Phone No: - 224844/6534444

**KRIMS HOSPITAL**

275, Central Bazar Road, Ramdaspath

NAGPUR. Phone No: - 6614564-65

**CARE HOSPITAL**

Farmland, Panchasheel Square,

NAGPUR. Phone No: - 3982444/3982222

**RATHI NURSING HOME** Plot No. 40, Balraj Marg,

Dhantoli, NAGPUR. Phone:-2420044

