

Name of Institute: Indus Institute of Sciences, Humanities and Liberal Studies
Name of Faculty : Department of Languages (English)

Course code: EN0111

Course name: Technical Communication

Pre-requisites: Basic English Vocabulary & Grammar

Credit points: 03

Offered Semester: 01

Course Coordinator (weeks 12)

Full name: Dr. Mamta Pillai (HoD, Dept. of Languages, IISHLS, IU)

Department with sitting location: Computer Lab (Grd. Flr.) (MB)

Telephone: 9924241816

Email: mamtapillai.gd@indusuni.ac.in

Consultation times: 4:00 to 5:00PM from Monday to Friday

Course Lecturer (weeks 12)

Full name: Ms. Pranjal Bhatt/ Ms. Foram Patel/Ms. Nidhi Singh

Department with sitting location: Equinox Lab, Grd Floor (MB)

Telephone: 9429296329/9537384053/8160976525

Email:

pranjalbhatt.gd@indusuni.ac.in/forampatel.ishls@indusuni.ac.in/nidhisingh.ishls@indusuni.ac.in

Consultation times: 4 to 5PM from Monday to Friday

Students will be contacted throughout the session via mail with important information relating to this course.

Course Objectives

By participating in and understanding all facets of this course a student will:

- 1) To enable students to do away with their inhibitions and stage-fright
- 2) To enhance their basic vocabulary and knowledge of sentence structure through Activities
- 3) To help them learn non verbal communication
- 4) To enable technology aided language learning

Course Outcomes (CO)

- 1) To help students develop comprehension and soft skills
- 2) To increase student's ability to improve and utilize the technical skills necessary for reading and writing.
- 3) To improve students' communication skills in both technical and professional contexts.
- 4) To help students improve the articulation and express thoughts fluently in the second language.

Course Outline

- 1) Listening Skills
- 2) Public Speaking activities
- 3) Grammar & Vocabulary
- 4) Reading and Comprehension

Course Content

Unit 1: Listening

- Icebreaking - Switch Introduction
- Icebreaking - Past, Present and Future
- Listening/ Cloze Test 1
- Listening/ Ted Talk
- Listening/ Josh Talk
- Listening/Celebrity Interviews
- Listening/ News Hour debates

Unit 2: Speaking

- Introduction and Polite Conversations
- Situational Dialogues
- Role Play
- Body Language
- Group Discussion

- JAM Sessions

Unit 3: Language Focus

- Teaching Remedial Grammar through Poem
- Vocabulary Building/Describing Words
- Movie Viewing and Discussion
- Book and Movie Adaptation
- Match Commentary and Review

Unit 4: Reading Skills

- Reading/Reading with Vocalic
- Read and Tweet
- Skimming/Scanning the Newspapers
- Reading/Play Enactment
- Reading/Short Stories

Method of delivery

- 1) Communicative Language Teaching (Learner Centric)
- 2) Face to face lectures
- 3) Task Based Language Learning
- 4) The Lexical Approach

Study time

03 Hours

CO-PO Mapping (PO: Program Outcomes)

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

Blooms Taxonomy and Knowledge retention (For reference)

(Blooms taxonomy has been given for reference)

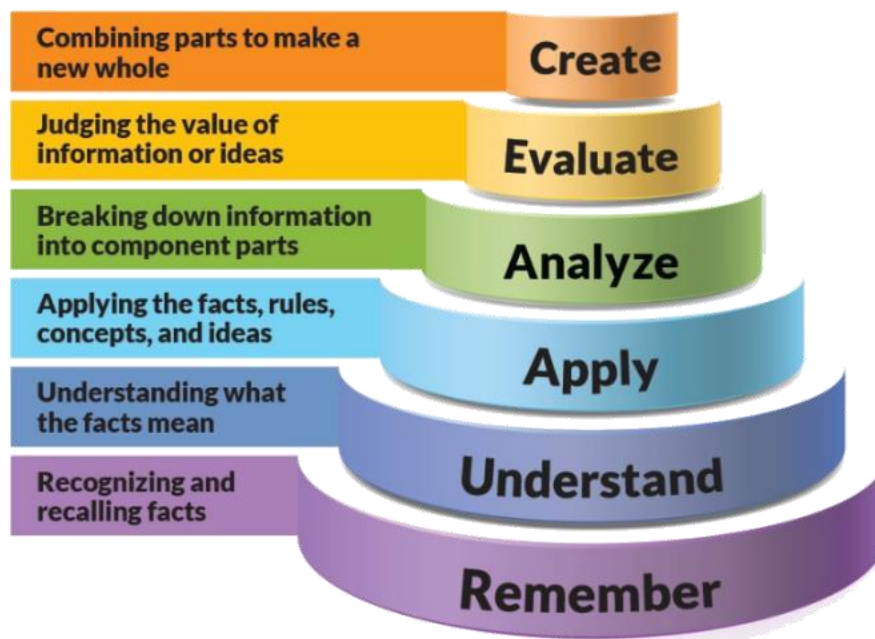


Figure 1: Blooms Taxonomy

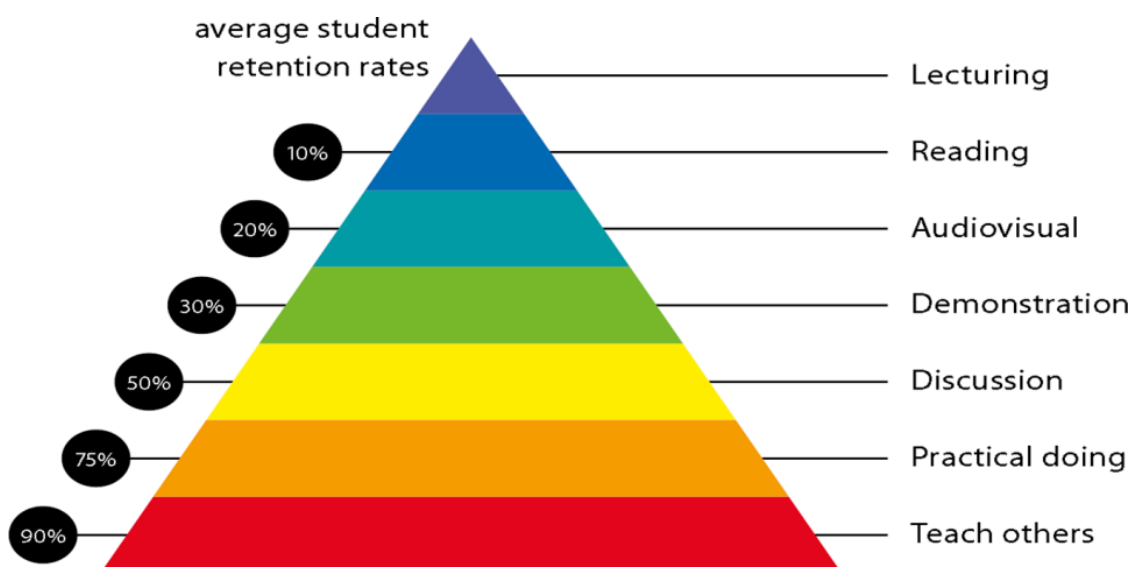


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of _____ Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	2 Information literacy, gathering & processing
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	4 Problem solving skills
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	5 Written communication
	6 Oral communication
	7 Teamwork
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	10 Sustainability, societal & environmental impact

Practical work: TUTORIAL SIMULATION TASKS

Lecture/Tutorial Time:

(Give lecture times in the format below)

(1Hour theory and 2Hours practical per week) As per the Master Time-Table of FY B.Tech Year -2021

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for semester examinations.

Details of referencing system to be used in written work: NIL

Text books: NIL

References:

- English for Engineers and Technologists, Volumes 1 and 2, Department of Humanities and Social Sciences, Anna University, Chennai, Orient Longmans Publication, 2008.
- Balasubramanyam, M and Anbalagan, G., Perform in English, Anuradha Publications, Kumbakonam, 2010.
- Meenakshi Raman and Sangeetha Sharma, Technical Communication: Principles and Practice, Oxford University Press, New Delhi, 2004.
- KiranmaiDutt, P.et al., A Course on Communication Skills, Edition Foundation Books, New Delhi, 2007.
- Ashraf Rizvi, M., Effective Technical Communication, Tata McGraw Hill Publication, New Delhi, 2008.
- Geoffrey Leech, Jan Swartvik, 'A Communicative Grammar of English', ELBS – Longman.
- Norman and Lewis, 'English Made Easy', Oxford Publication.
- E- Writing: 21st –Century Tools for Effective Communication, Dianna Booher, Macmillan India Ltd., 2007, ISBN – 1403-93202-6

Additional Materials

Will be provided the study notes to students via Email

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

Mid Semester Exam(MSE)	40 marks
Attendance	05 (80%)
Simulation Tasks	15 Marks
End Semester Exam(ESE)	40 marks

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in internal component or less than 40% in the end semester will be considered for supplementary assessment in the respective components (i.e internal component or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (internal component or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of 2% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own

- if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment).

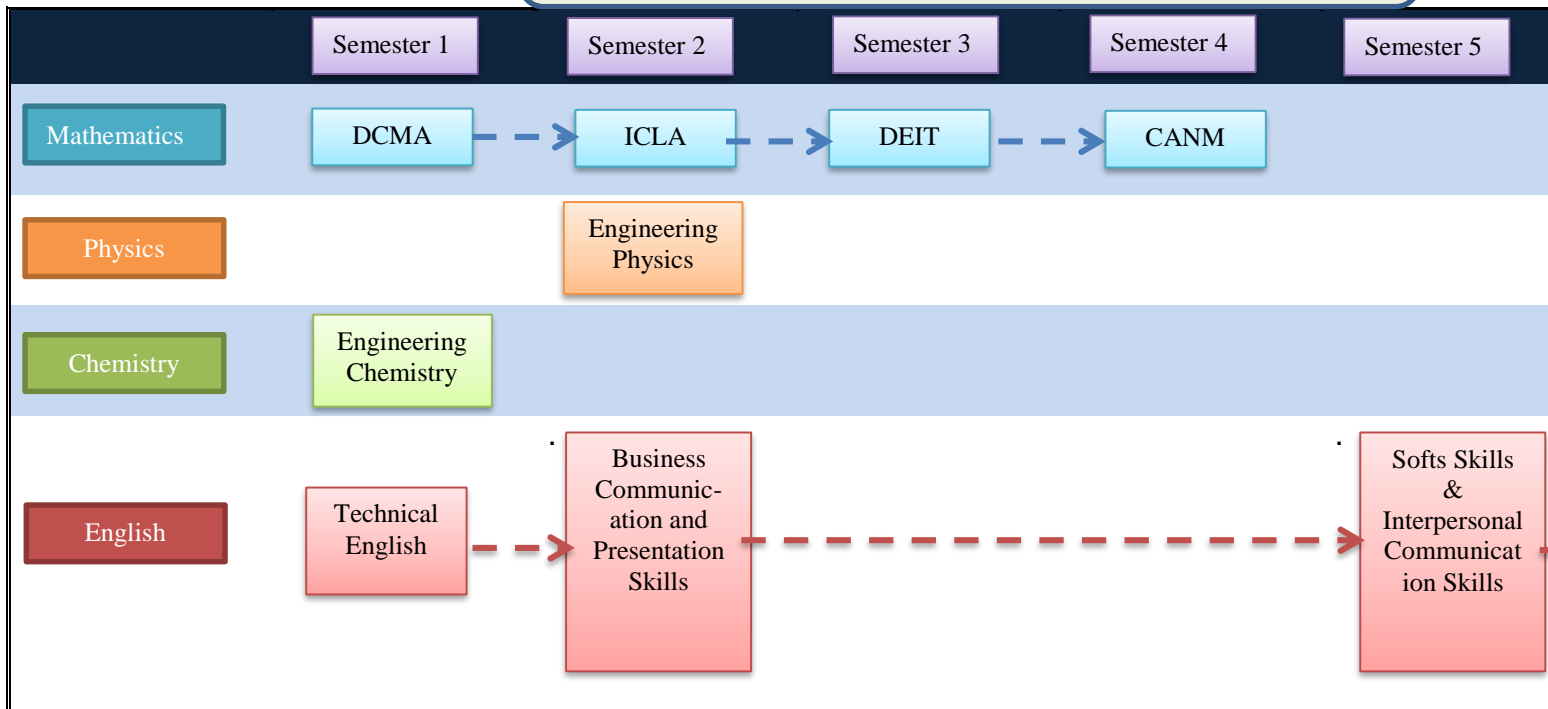
Course schedule(subject to change)

(Mention quiz, assignment submission, breaks etc as well in the table under the Teaching Learning Activity Column)

	Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
	Weeks 1	Ice Breaking Activity	1	Written test and ABL
	Weeks 2	Non Verbal Communication	1	Discussion and ABL
	Week 3	Role Play	2	ABL
	Week 4	Phonetics	2	Chalk & Talk
	Week 5	Vocabulary	2	ABL
	Week 6	Listening Theory and practice	3	ABL
	Week 7	Brushing up grammar through poem	4	Discussion
	Week 8	Movie Viewing& Discussing book adaptation into movies and series	4	Discussion
	Week 9	Writing dialogues	1	Writing
	Week 10	Reading Newspaper and social media	4	Discussion
	Week 11	Reading short stories & Play enactment	4	Discussion
	Week 12	Reading Test	4	Writing

PROGRAM MAP for Bachelor of Engineering
(Science & Humanities)

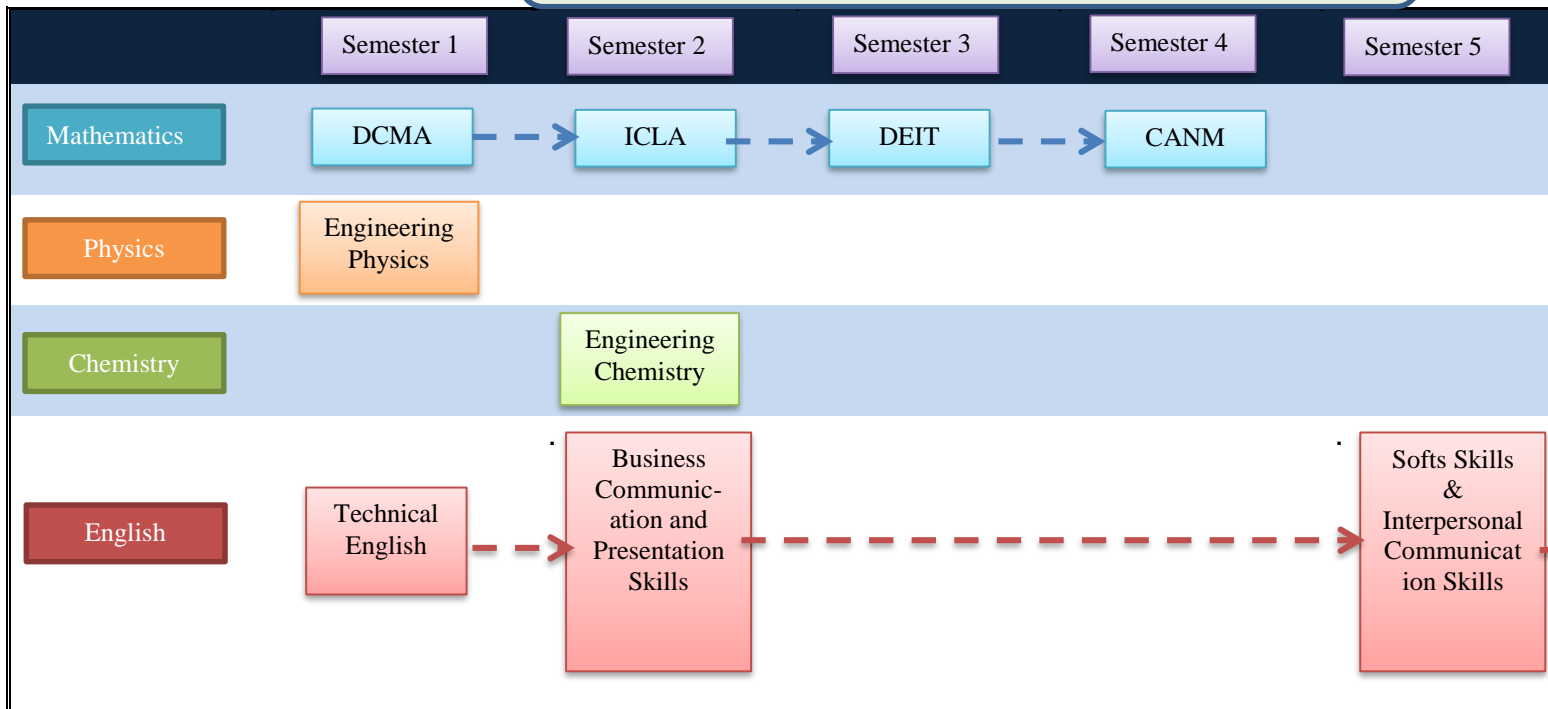
Subject Mind Mapping



To be used for the following Branches: Information & Technology, Computer, Computer Science, Electrical, Electrics & Communication

**PROGRAM MAP for Bachelor of Engineering
(Science & Humanities)**

Subject Mind Mapping



To be used for the following Branches: Automobile; Metallurgy; Civil; Mechanical

Teaching Scheme: Technical Communication

Subject: Technical Communication								
Program: B.Tech. All Branches				Subject Code: EN0111			Semester: I	
Teaching Scheme				Examination Evaluation Scheme				
Lecture	Tutorial	Practical	Credits	University Theory Examination	University Practical Examination	Continuous Internal Evaluation (CIE)-Theory	Continuous Internal Evaluation (CIE)-Practical	Total
1	2	0	3	40	0	60	0	100

Course Objectives:

- To help students develop comprehension and soft skills.
- To increase student's ability to improve and utilize the technical skills necessary for reading and writing.
- To improve students' communication skills in both technical and professional contexts.

Course Content:

Unit 1: Listening

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- Icebreaking - Past, Present and Future
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- Listening/Celebrity Interviews
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Unit 2: Speaking

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- Situational Dialogues
- Role Play
- Body Language
- Group Discussion
- JAM Sessions

Unit 3: Language Focus

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Unit 4: Reading Skills

- Reading/Reading with Vocalic
- Read and Tweet
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Reference Books:

- English for Engineers and Technologists, Volumes 1 and 2, Department of Humanities and Social Sciences, Anna University, Chennai, Orient Longmans Publication, 2008.
- Balasubramanyam, M and Anbalagan, G., Perform in English, Anuradha Publications, Kumbakonam, 2010.
- Meenakshi Raman and Sangeetha Sharma, Technical Communication: Principles and Practice, Oxford University Press, New Delhi, 2004.
- KiranmaiDutt, P. et al., A Course on Communication Skills, Edition Foundation Books, New Delhi, 2007.
- Ashraf Rizvi, M., Effective Technical Communication, Tata McGraw Hill Publication, New Delhi, 2008.
- Geoffrey Leech, Jan Swartvik, 'A Communicative Grammar of English', ELBS – Longman.
- Norman and Lewis, 'English Made Easy', Oxford Publication.
- E- Writing: 21st –Century Tools for Effective Communication, Dianna Booher, Macmillan India Ltd., 2007, ISBN – 1403-93202-6
- R. K Bansal, spoken English for India (Orient Longman, Madras, 1972.

Web resources/ MOOCs:

Grammar Clauses: <https://www.khanacademy.org/humanities/grammar/syntax-sentences-and-clauses>

Parts of Speech Conjunctions & Prepositions: <https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-preposition-and-the-conjunction>

Nouns: <https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-noun>

Verbs: <https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-verb>

Pronouns: <https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-pronoun>

Adjectives & Adverbs: <https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-modifier>

Syntax: Conventions of Standard English: <https://www.khanacademy.org/humanities/grammar/syntax-conventions-of-standard-english>

Name of Institute: Indus Institute of Sciences, Humanities and Liberal Studies (IISHLS)

Name of Faculty: Dr. Lokesh Mohan

Course code: PH0011

Course name: Engineering Physics

Pre-requisites: 12th Std Physics (Calculus, Vector analysis, Introduction of Electromagnetism, Quantum concept)

Credit points: 04

Offered Semester: I

Course Coordinator (weeks 01 - 17)

Full Name: Dr. Manisha Vithalpura

Department with sitting location: Physics Department, Physics lab

Telephone: 3314 (sitting location), 7874636405 (Mobile)

Email: manishavithalpura.gd@indusuni.ac.in

Consultation times: 1:30 pm to 4:00 pm (Tuesday)

Course Lecturer (weeks 01 - 17)

Full name: Dr. Lokesh Mohan

Department with sitting location: Physics Department, staff room, fourth floor, Bhanwar building

Telephone: 6360912375 (Mobile)

Email: lokeshmohan.ishls@indusuni.ac.in

Consultation times: 1:30 pm to 4:45 pm (Friday)

Students will be contacted throughout the Session via Mail with important information relating to this Course.

Course Objectives

By participating in and understanding all facets of this Course a student will:

- 1) To describe the basic laws of Physics, mathematical foundations and Engineering theory and to apply the knowledge in modeling and designing a real-world problem (**fundamental engineering analysis skills**).
- 2) To analyze a problem, identify and formulate using the concept of physics and to solve engineering problem (**engineering problem solving skills**).
- 3) To analyze and interpret experimental data using concepts of Physics (**information retrieval skills**).

- 4) To analyze and use current techniques, skills and tools necessary for Physics and engineering practice (**practical engineering analysis skills**).

Course Outcomes (CO)

1. To understand the basic concept of physics in the engineering field
2. To analyze a problem, identify and formulate using the concept of physics and to solve engineering problem
3. To understand the properties of dielectric and magnetic material and their applications in electric and magnetic devices
4. To understand the basic principle of superconductivity and ultrasound with specific applications in engineering
5. To analyze the concept of quantum mechanics and semiconductor physics and its applications in engineering field
6. To understand the optical phenomena of light like Interference and Diffraction and its application in optical devices

Course Outline

UNIT-I : Introduction to Electromagnetic

Module:1 Electrostatics & Dielectrics

Coulomb's law for distribution of charges, Gauss's law and applications, Electric field intensity, Electric flux, Electric dipole moment, Electric field due to dipole, Introduction to dielectrics, Polarizability, Types of polarization – electronic, ionic, orientational, Polarization of dielectrics, Gauss's law in presence of dielectric, Dielectric constant, Electric susceptibility and Permittivity, Internal (Local) field in dielectric, Clausius Mossotti equation (with derivation)

Module:2 Magnetism

Magnetic field, Steady current, Ampere's law, Biot-Savart law and its applications, Faradays law of Induction, Lenz's Law; Effect of magnetic field on current carrying conductor, Lorentz force.

Basic important terms and units in Magnetism, Concept and origin of magnetic moment, magnetic susceptibility, Total angular momentum, Diamagnetism, Paramagnetism, Ferromagnetism, Ferrimagnetism, Antiferromagnetism, Domain theory of Ferromagnetism, Curie temperature and hysteresis loss

UNIT-II : Superconductivity and Sound

Module 1: Superconductivity

Superconductivity: Zero resistance, Critical temperature, Meissner effect, Critical field, General properties of superconductors, Type-I and Type-II superconductors, BCS theory of Superconductor, High temperature superconductors, Applications of Superconductors: SQUID, Maglev etc.

Module 2: Sound

Introduction to sound waves, Characteristics and Properties of Sound, Absorption co-efficient, Reverberation time, Sabine's formula (without derivation), Factors affecting architectural acoustics, Introduction of Ultrasonic waves, Generation of ultrasonic waves, Detection of ultrasonic waves, Applications of Ultrasonic waves: NDT, SONAR & others.

UNIT-III : Introduction to Quantum and Semiconductor Physics

Module 1: Quantum Mechanics

Black body radiation: Planck's law; Wave nature of Particles: De-Broglie theorem, Uncertainty principle; Schrodinger's wave equation - Time independent and time dependent equations; Born interpretation, probability current; Solution of stationary-state Schrodinger equation for one dimensional problems- particle in a box

Module 2 : Introduction to solids and Semiconductor Physics

Kronig-Penny model (to introduce origin of band gap), Energy bands in solids, E-k diagram; Types of electronic materials: metals, semiconductors, and insulators, Density of states, Occupation probability, Fermi level, Effective mass. Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination, Carrier transport: diffusion and drift, p-n junction diode.

UNIT-IV : Wave Optics& Laser

Module 1: Wave optics

Huygens' principle, superposition of waves and interference of light by wave front splitting and amplitude splitting; Young's double slit experiment, Newton's rings, Farunhofer diffraction from a single slit, the Rayleigh criterion for limit of resolution and its application to vision; Diffraction gratings and their resolving power, Michelson interferometer

Module 2: Laser

Einstein's theory of matter radiation interaction and A and B coefficients; Amplification of light by population inversion, Properties of laser beams: monochromaticity, coherence, directionality and brightness; Different types of lasers: gas lasers (He-Ne), solid-state lasers (Neodymium); Applications of lasers in science, engineering and medicine.

Method of delivery

(Face to face lectures, Power Point Presentation, Self assessment, Active Learning Techniques)

Study time

(3 hours per week for lectures, 2 hours per week for Practical)

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness Basic concept of basic physics Also application of the physics principle in engineering field
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	2 Information literacy, gathering & processing Critical and logical thinking is developed through numerical practice. Used various sources of the material and technology to perform the experimental part.
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	4 Problem solving skills By practicing numerical, logical and critical thinking will be developed.
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	5 Written communication Conducting frequent unit test will develop their written communication skill
	6 Oral communication Arranging presentation on different physics topics throughout the semester
	7 Teamwork Group discussion in class and lab is arranged
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	10 Sustainability, societal & environmental impact

Practical work:

Experiment no.	Title
1	Dielectric constant: To determine the dielectric constant of a dielectric substance.
2	To determine the <u>magnetic field at the center of a coil and its variation with distance and radius of the coil.</u>
3	To verify the <u>Faraday's law of electromagnetic induction.</u>
4	<u>Hysteresis loss:</u> To determine the Hysteresis loss in a Ferromagnetic material.
5	<u>Ultrasonic Interferometer:</u> To determine the wavelength and velocity of ultrasonic wave through ultrasonic interferometer.
6	<u>Planck's Constant:</u> To determine the Planck's Constant using LED
7	To study the <u>V-I characteristics of p-n junction diode</u>
8	To verify the Inverse Square Law using Photocell
9	To determine the <u>refractive index of prism</u> using Spectrometer
10	<u>Resolving power of grating:</u> To determine resolving power of a diffraction grating.
11	<u>Newton's Ring:</u> To determine the wavelength of monochromatic light
12.	<u>Determination of Wavelength of Laser:</u> To determine the wavelength of LASER using diffraction grating.

Lecture/tutorial times

Example:

Lecture : Monday time: 3.20 pm to 4.10 pm
Thursday time: 9.00 am to 9.55 am
Friday time: 11.00 am to 11.55 am

Practicals : Wednesday: batch-1 time: 1.30 pm to 3.20 pm
Thursday : batch-2 time: 11.00 am to 12.50 pm

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the Course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for mid and end semester examinations.

Details of referencing system to be used in written work

Unit test will be conducted in the classes and test papers will be kept with course coordinator for the future reference.

Text books

1. Engineering Physics by H K Malik, A K Singh, Tata Mc Graw-Hill Education Pvt. Ltd., 2nd edition, 2018, ISBN: 978-93-5260-695-5
2. Engineering Physics by D.K. Bhattacharya, Poonam Tandon, Oxford University Press, first published, 2015, ISBN-13:978-0-19-945281-1

Additional Materials

1. Engineering Physics; Fundamentals and Modern applications by P. Khare & A. Swarup, Jones & Bartlett Learning, 2009, ISBN-13: 978-0763773748
2. A textbook of Engineering Physics by S.O. Pillai and Sivakami, New Age International, Third edition, 2011, ISBN: 978-81-224-3162-9
3. An introduction to Electrodynamics by David Griffiths, Pearson Education, 3th edition, 1999, ISBN: 9780138053260
4. Optics by A. Ghatak, McGraw-Hill Education India Private Limited, 6th edition, 2017, ISBN-13: 978-9339220907
5. Engineering Electromagnetics by W H Hayt & J A Buck, McGraw-Hill Education, 8th edition, 2017, ISBN-13: 978-9339203276
6. Engineering Physics by K. Rajagopal, Prentice Hall of India Pvt. Ltd., 2007, ISBN: 9788120332867
7. A Textbook of Engineering Physics by M. N. Avadhanulu, P. G. Khirsagar, S. Chand Pub., Revised edition, 1992, ISBN: 9788121908177
8. University Physics, Sears and Zemansky, Pearson Education India, 13th edition, 2013, ISBN-13: 978-8131790274

Web resources:

1. **Topics: Acoustics & Optics:**
http://www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Guwahati/engg_physics/index_cont.htm
2. **Course: Engineering Physics:**
<http://www.nptelvideos.in/search?q=engineering+physics>
3. **Topic: Laser:**<http://science.howstuffworks.com/laser1.htm>
4. **Topic: Optics:** <http://www.pitt.edu/~poole/physics.html#light>
5. **Topic: Magnetism:**
<https://www.khanacademy.org/science/physics/magnetic-forces-and-magnetic-fields>
6. **Topic: Interference:**
<https://www.khanacademy.org/science/physics/light-waves>
7. **Topic: Quantum Mechanics:**
<https://ocw.mit.edu/courses/physics/8-04-quantum-physics-i-spring-2016/index.htm>

MOOCs:

<https://www.edx.org/course/subject/physics>

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

Continuous Internal Evaluation (Theory)

Mid-Sem exam	40% , Unit-1/2, Objective (1,2,5)
Assignment	10% , Objective (1,2,5)
Project/Presentation	5% , Objective (1,2,6)
Attendance	5% (end of the semester)
Total	60% (CIE theory)
Final exam (closed book)	40% Objectives (1-6)

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in mid semester or end semester will be considered for supplementary assessment in the respective components (i.e mid semester or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (mid semester or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

Student has to complete the experiment in their respective lab in a week, will be evaluated weekly basis. A report on practical work is to be submitted after completion of the lab by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

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Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment).

Course schedule(subject to change)

	Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
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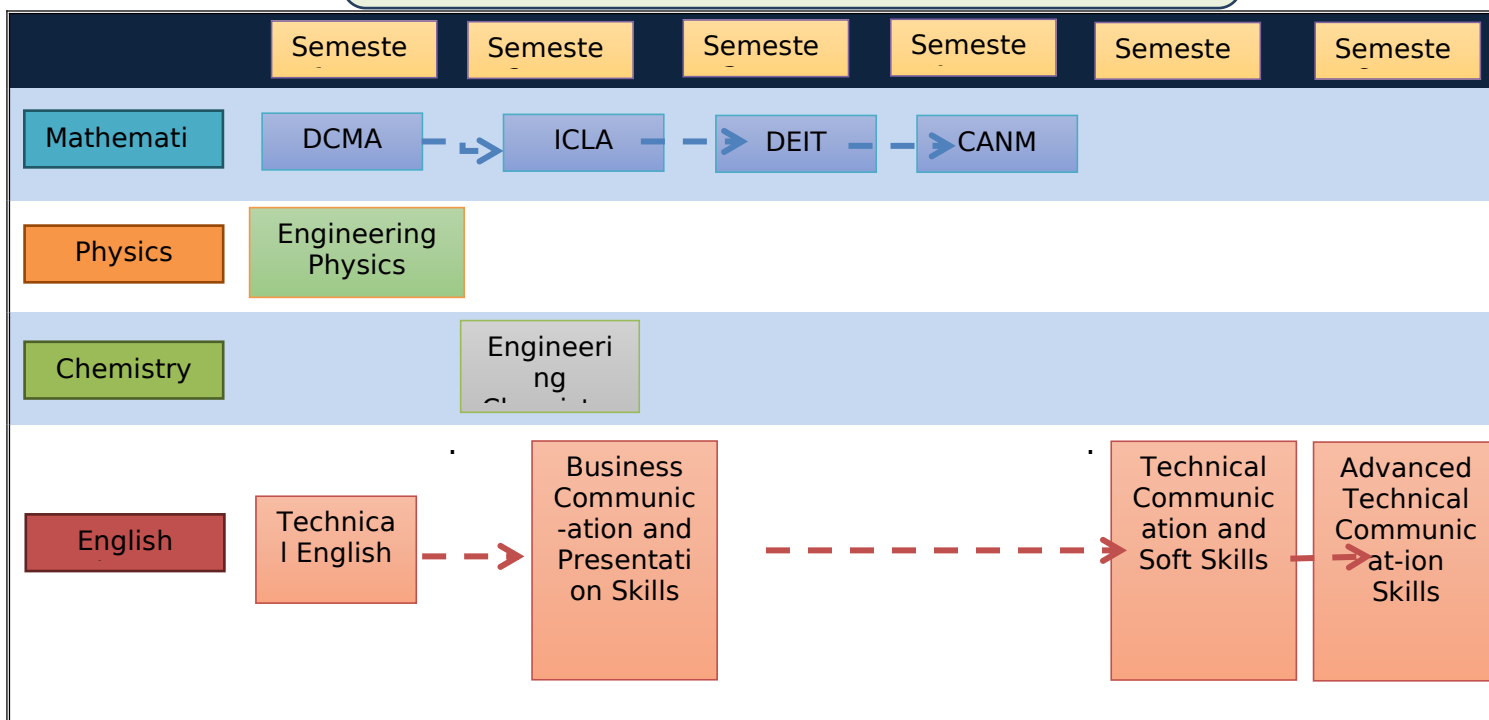
Weeks 1	M-1: Coulomb's law for distribution of charges, Gauss's law and applications, Electric current and Equation of continuity, Electric field intensity, Electric flux, Electric dipole moment, Divergence and curl of electrostatic field, Introduction to dielectrics, Polarizability, Types of polarization – electronic, ionic, orientational, Polarization of dielectrics, Gauss's law in presence of dielectric, Dielectric constant, Electric susceptibility and Permittivity,	1,2,5	PPT, chalk and board
Weeks 2	Internal (Local) field in dielectric, Clausius Mossotti equation (with derivation), M-2: Magnetic field, Steady current, Biot-Savart law, Ampere's law, Divergence and curl of static magnetic field, vector potential and calculating it for a given magnetic field using Stokes' theorem,	1,2,3	Chalk Board and
Week 3	Effect of magnetic field on current carrying conductor, Lorentz force, Faraday's law in terms of EMF produced by changing magnetic flux; Lenz's law; M-3: Basic important terms and units in Magnetism, Concept and origin of magnetic moment, magnetic susceptibility, Total angular momentum	1,2,3	Chalk Board and
Week 4	Diamagnetism, Paramagnetism, Ferromagnetism, Domain theory of Ferromagnetism, hysteresis loss, numerical,	1,2,3	Chalk Board and
Week 5	Introduction to Superconductors and its properties, types of it	1,2,4	PPT and chalk-board
Week 6	Numerical practice, Test	1,2,4	Chalk board and

Week 7	Types-I , II superconductor, BCS theory and introduction to Sound wave	1,2,4	Ppt and chalk and board
Week 8	Audible sound and its characteristics, factor affecting and ultrasound	1,2,4	Ppt and chalk-board
Week 9	Introduction to subject, M-1 : Introduction, Black body radiation and laws if Black body radiation, De-Broglie theorem, Uncertainty principle; Schrodinger's wave equation	1,2,5	PPT, chalk and board
Week 10	Born interpretation, probability current; Solution of stationary-state, Schrodinger equation for one dimensional problems-particle in a box, Numerical practice	1,2,5	PPT, chalk and board
Week 11	Types of electronic materials: metals, semiconductors, and insulators, Density of states, Occupation probability, Fermi level, Effective mass., Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics),	1,2,5	Chalk board and
Week 12	Carrier generation and recombination, Carrier transport: diffusion and drift, p-n junction diode & Numericals, Unit test-1	1,2,5	Chalk board and
Week 13	M-1 : Wave front, Huygens' principle, superposition of waves and interference of light by wave front splitting and amplitude splitting, Young's double slit experiment, Newton's rings, Numerical, test II	1,2,6	PPTs Chalk board and and
Week 14	Farunhofer diffraction from a single slit, the Rayleigh criterion for limit of resolution and its application to vision;, Diffraction gratings and their resolving power, Michelson interferometer, numerical	1,2,6	PPTs Chalk Board and and

Week 15	M-2: Einstein's theory of matter radiation interaction and A and B coefficients; Amplification of light by population inversion, Properties of laser beams: mono-chromaticity, coherence, directionality and brightness; Different types of lasers: gas lasers (He-Ne), solid-state lasers (Neodymium);	1,2,6	PPTs
Week 16	Applications of lasers in science, engineering and medicine., Numerical problems	1,2,6	PPTs
Week 17	Revision	1-6	PPT

PROGRAM MAP for Bachelor of Engineering
(Institute of Sciences, Humanities and Liberal Studies)

Subject Mind Mapping



To be used for the following Branches: Automobile Engineering

Name of Institute: Indus Institute of Technology & Engineering

Name of Faculty: Prof. Jainisha Patel/ Prof. Pradnya Tikhe

Course code: CV0004

Course name: Environmental Science

Pre-requisites:

Basic knowledge on Environmental issues.

Knowledge on chemistry and laboratory equipment.

Credit points: 2

Offered Semester: 1st (Information & Technology)

Course Coordinator

Full name: Prof. Pradnya Tikhe

Department with siting location: 3rd Floor staff Room, Bhanwar Building

Telephone: 3006

Email: pradnyatikhe.cvl@indusuni.ac.in

Consultation times: 9.00 to 5.00

Course Lecturer

Full Name: Prof. Jainisha Patel

Department with siting location: Environmental Engineering Lab, Ground floor, Extension building

Telephone: 3006

Email: jainishapatel.cvl@indusuni.ac.in

Consultation times: 9.00 to 5.00

Students will be contacted throughout the Session via Mail with important information relating to this Course.

Course Objectives

By participating in and understanding all facets of this Course a student will:

- Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Course Outcomes (CO)

- Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Master core concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
- Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Course Outline

To introduce students to the integrated science, engineering, design and management concepts of engineered environmental systems. The course will cover environmental regulations and

standards, environmental parameters, mass balance and natural systems, water quality management, water and wastewater treatment, air pollution control, noise pollution, and solid and hazardous waste management. Background material and laboratories in the environmental sciences and management areas will be covered. Group term papers and presentations will be required.

Method of delivery

60% of Lectures consist of Face to face lectures which are conducted in classrooms, 30% of lectures comprise of PowerPoint Presentation through which various videos and images of related topics are shown to the students, and 10% of lectures consist of hands on session.

Study time

2 hours of lectures (theory) per week.

CO-PO Mapping (PO: Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	2	-	-	-	1	-	-
CO2	-	3	-	-	-	-	3	2	-	-	-	1
CO3	-	-	-	-	-	3	2	-	-	-	1	-
CO4	-	3	2	-	-	-	1	-	-	1	-	-
CO5	-	2	-	3	-	-	-	-	-	-	-	-
CO6	3	-	2	-	1	1	-	-	-	-	-	-

1-Lightly Mapped 2- Moderately Mapped 3- Highly Mapped

Blooms Taxonomy and Knowledge retention (For reference)

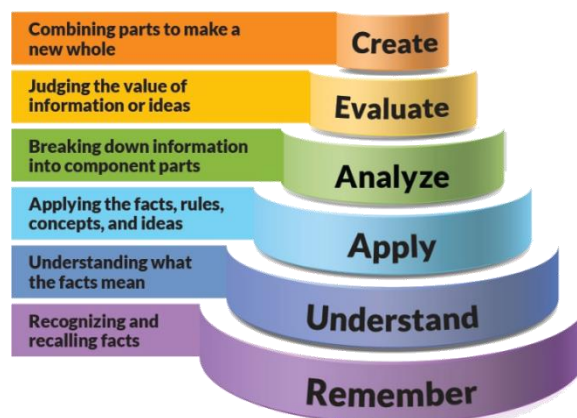


Figure 1: Blooms Taxonomy

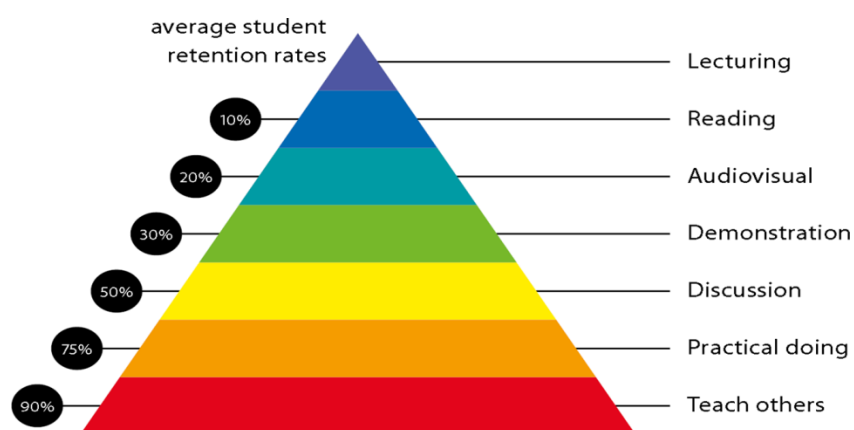


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of _____ Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness

<p>Independent learners</p> <p>Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.</p>	2 Information literacy, gathering & processing
<p>Problem solvers</p> <p>Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.</p>	4 Problem solving skills
<p>Effective communicators</p> <p>Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.</p>	5 Written communication
	6 Oral communication
	7 Teamwork
<p>Responsible</p> <p>Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.</p>	10 Sustainability, societal & environmental impact

Practical work:

Lecture/laboratory times

Lecture (IT-I)

Tuesday 09:55 to 10:50

Wednesday 11:55 to 12:50

Lecture (IT-II)

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the Course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for mid and end semester examinations.

Details of referencing system to be used in written work

Text books

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha Second edition, 2013 Publisher: Universities Press (India) Private Ltd, Hyderabad

Reference Books:

- Basics of Environmental Studies by Prof Dr N S Varandani ,2013 Publisher: LAP Lambert Academic Publishing , Germany
- Environmental Studies by Anindita Basak ,2009 Publisher: Drling Kindersley(India)Pvt. Ltd
- Pearson Textbook of Environmental Studies by Deeksha Dave & S S Kateva , Cengage Publishers.
- Environmental Sciences by Daniel B Botkin & Edward A Keller Publisher: John Wiley & Sons.
- Environmental Studies by R. Rajagopalan, Oxford University Press
- Environmental Studies by Benny Joseph, TMH publishers
- Environmental Studies by Dr. Suresh K Dhameja, 2007 Published by: S K Kataria & Sons New Delhi
- Basics of Environmental Studies by U K Khare, 2011 Published by Tata McGraw Hill

Additional Materials

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

Example:

Class test	05
Power Point Presentation	15
Final exam (<i>closed book</i>)	40

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in mid semester or end semester will be considered for supplementary assessment in the respective components (i.e mid semester or end semester) of semester concerned. Students must make them available during the supplementary examination period to take up the respective components (mid semester or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course schedule (subject to change)

	Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
	Weeks 1	Environment: Levels of organizations in environment, Structure and functions in an ecosystem Biosphere: Its Origin and distribution on land, in water and in air, Ecosystem and functioning of Ecosystem	1,3	PPT and BB
	Weeks 2	Natural Resources	2,1,4	PPT
	Week 3	Biodiversity and its conservation	3,2	BB and PPT
	Week 4	Environmental Pollution:	2,4,6	BB
	Week 5	Environmental Pollution, and Environmental Prevention	1,3	BB and PPT
	Week 6	Concept of clean Environment, man-made disasters, Case Studies of Indian Studies, Urban flooding, Heat Island Effect	2,4	BB
	Week 7	Management of pollution Technologies for Pollution Control Environmental Monitoring	1,5	BB and PPT
	Week 8	Research and Policies relating to environmental Protection	2,4,6	BB and PPT
	Week 9	Concept of sustainability and environmental Sustainability Index Environmental Ethics, people's participation	2,4,6	BB and PPT
	Week 10	Green Business (Profitability in managing Environment)	1,5,6,3	BB and PPT

		Sustainable Development,		
	Week 11	Public awareness, public participation	5.6.4	BB and PPT
	Week 12	Revision		PPT

Subject: Environmental Science								
Program: B.Tech. offered by Civil Dept.				Subject Code:CV0004			Semester: I/II	
Teaching Scheme				Examination Evaluation Scheme				
Lecture	Tutorial	Practical	Credits	Continuous Internal Evaluation (CIE)-Theory	Continuous Internal Evaluation (CIE)-Practical	University Theory Examination	University Practical Examination	Total
02	00	-	02	24/60	-	16/40	-	100

Course Objectives:

- Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Course Outcomes:

- Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- Master core concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
- Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
- Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
- Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

COURSE CONTENTS

Unit I

Concepts of Environmental Sciences: Environment: Levels of organizations in environment, Structure and functions in an ecosystem;

Biosphere: Its Origin and distribution on land, in water and in air, Ecosystem and functioning of Ecosystem.

Natural Resources: Renewable and Non-renewable Resources, Forests, water, minerals, Food and land (with example of one case study); Energy, Growing energy needs, energy sources (conventional and alternatives), State of Indian Environment.

Biodiversity and its conservation:

Biodiversity at global, national and local levels; India as a mega-diversity nation; Threats to biodiversity (biotic, abiotic stresses), and strategies for conservation.

Unit II

Environmental Pollution:

Types of pollution- Air, water (including urban, rural, marine), soil, noise, thermal, nuclear, Solid Waste (Organic and Inorganic), Concept of clean Environment; Case Studies of Indian Studies.

Introduction to man-made disasters(Urban Flooding, Heatwave)

Unit III

Pollution prevention:

Management of pollution- Rural/Urban/Industrial waste management [with case study of any one type, e.g., power (thermal/nuclear), fertilizer, tannin, leather, chemical, sugar], Solid/Liquid waste management, disaster management.

Environmental Monitoring:

Monitoring- Identification of environmental problem, tools for monitoring (remote sensing, GIS); Sampling strategies- Air, water, soil sampling techniques

Technologies for Pollution Control: Bio-remediation, phytoremediation, bio-pesticides, bio-fertilizers;

Legal issues: Environmental legislation (Acts and issues involved), Environmental Protection Acts : (Swachh Bharat Abhiyan, state Action Plans)

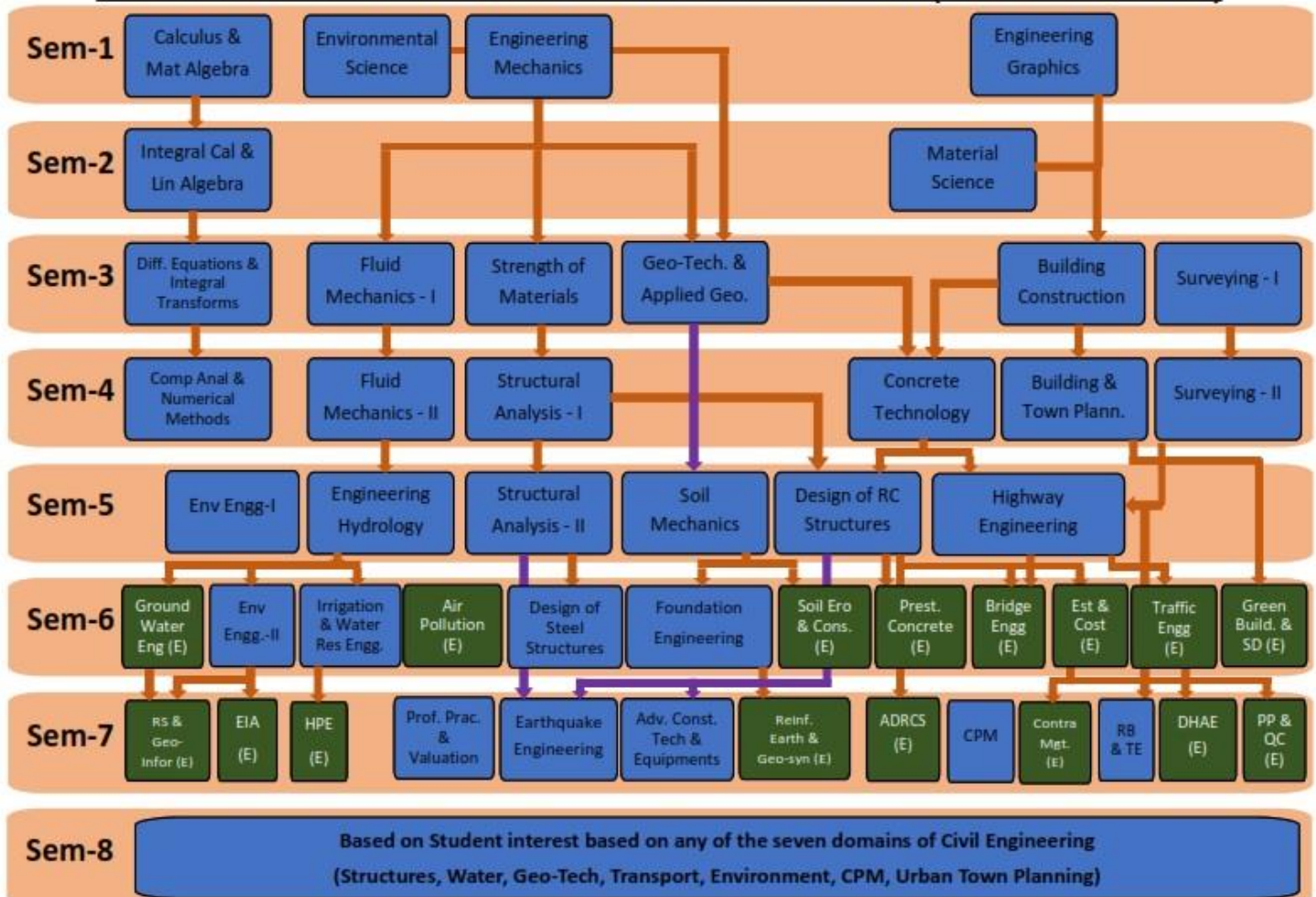
Research and Policies relating to environmental Protection

Unit IV

Social Issues and the Environment:

Concept of sustainability and Sustainable Development, environmental Sustainability Index, Environmental Ethics, Public awareness and people's participation, Green Business (Profitability in managing Environment)

SEMESTER-WISE SUBJECT DEPENDENCY CHART 2017 BATCH (CIVIL DEPARTMENT)



Name of Institute: IITE

Name of Faculty: Mr.Ajay Sikdar

Course code: MME0103

Course name: Material Science

Pre-requisites: Physics, Chemistry

Credit points: 3

Offered Semester: 1st sem

Course Coordinator (weeks XX - XX)

Full Name: Mr.Ajay Sikdar

Department with sitting location: Third Floor staff room

Telephone:99798 53458

Email: ajaysikdar.mt@indusuni.ac.in

Consultation times: Monday and Tuesday 4:15 – 5:00PM

Course Lecturer (weeks xx - XX)

Full Name: Mr.Ajay Sikdar

Department with sitting location: Third Floor staff room

Telephone:99798 53458

Email: ajaysikdar.mt@indusuni.ac.in

Consultation times: Monday and Tuesday 4:15 – 5:00PM

Students will be contacted throughout the Session via Mail with important information relating to this Course.

Course Objectives

By participating in and understanding all facets of this Course a student will:

1. To evaluate different materials for engineering applications.
2. To categorize material according to their properties and requirement.
3. To classify materials and understand the importance of each material in order to find applications in other fields of engineering.

Course Outcomes (CO)

CO1- Students will be able to define material Science. [BT-11]

CO2- Students will be able to classify various Engineering Materials. [BT-2]

CO3- Students will be able to identify various Engineering Materials.[BT-3]

CO4- Students will be able to compare various Engineering Materials and their properties. [BT-4]

CO5-Students will be able to recommend material for application. [BT-5]

CO6- Students will be able discuss the criteria for selection of Materials.[BT-6]

Course Outline

The proposed course deals with various surface preparation and coating methods. .

Method of delivery

(Face to face lectures, self study material, Active Learning Techniques)

Study time

3 lectures

CO-PO Mapping (PO: Program Outcomes)

Introduction to Engineering Materials (MME0101)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1	1	1	-	-	-	-	1	2
CO2	2	1	1	1	2	1	-	-	-	-		1
CO3	2	1	1	2	1	2	-	-	-	-	2	1
CO4	1	2	2	1	2	-	-	-	-	-	-	2
CO5	1	2	2	1	-	-	-	-	-	-	-	-
CO6	2	2	1	-	-	-	-	-	-	-	1	1
MME0101	1.66	1.66	1.5	1	1	1.33	-	-	-	-	1.33	1.4

1-Lightly Mapped 2- Moderately Mapped 3- Highly Mapped

Blooms Taxonomy and Knowledge retention (For reference)

(Blooms taxonomy has been given for reference)

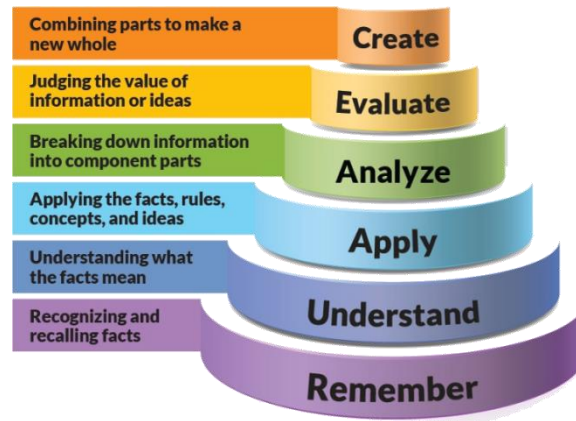


Figure 1: Blooms Taxonomy

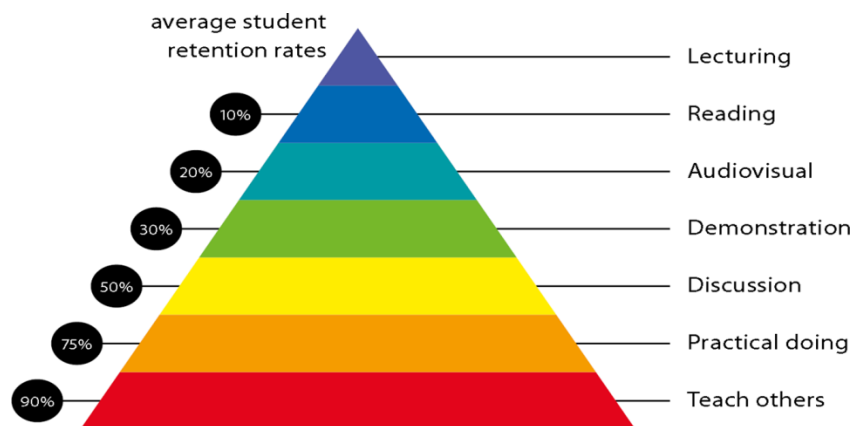


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of _____ Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness

Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	2 Information literacy, gathering & processing
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	4 Problem solving skills
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	5 Written communication
	6 Oral communication
	7 Teamwork
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	10 Sustainability, societal & environmental impact

Practical work:

NA

Lecture/tutorial times

(Give lecture times in the format below)

Example:

Lecture	Monday	09.55 – 10.50 am
Lecture	Monday	02.30 – 03.30 pm
Lecture	Tuesday	09.00 – 09.55 am

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the Course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for mid and end semester examinations.

Details of referencing system to be used in written work**Text Book(s)**

1. O. P. Khanna, “Material Science and Metallurgy”, Dalpat Rai Publications, 2nd Edition, 2014, ISBN: 9789383182459.
2. R. K Rajput, “Engineering Materials”, S. Chand Publications, 4th Edition, 2000, ISBN: 9788121919609.
3. W.D. Callister, “Material Science & Engineering – An Introduction”, John Wiley Publishers, 7th Edition, 2007, ISBN: 9780471736967.

Reference Books

1. J. Shackelford, “Introduction to Materials Science for Engineers”, Pearson-Prentice Hall Publications, 8th Edition, 2006, ISBN: 8131700909.
2. L.H. Vanvlack, “Elements of Materials Science and Engineering”, Pearson Education India, 6th Edition, 2002, ISBN: 8131706001.
3. D. Swarup, “Elements of Metallurgy”, Rastogi Publications, 2005, ISBN: 8171338135.
4. V. Raghavan, “Materials Science and Engineering – A First Course”, Prentice Hall India Learning Private Limited, 6th Edition, 2015, ISBN: 8120350928.

Digital Learning Resources

www.nptel.ac.in

www.edx.org

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

Example:

MSE	40%
Quiz 1	10%
Quiz 2	10%
Final exam (<i>closed book</i>)	40%

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% CIE or end semester will be considered for supplementary assessment in the respective components (i.e CIE or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (mid semester or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report: (NA)

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -1% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course schedule (subject to change)

	Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
	Weeks 1	Introduction about subject, requirement of different materials, Classification of Engineering materials		BB, PPT
	Weeks 2	Properties of engineering materials, Criteria for selection of materials for engineering application.		BB, PPT
	Week 3	Structure of crystalline solids; Lattices, unit cells; atom size, co-ordination number, atomic packing factor., Indexing of directions and planes, notations		BB, PPT
	Week 4	Interplanar spacing and angles, Crystalstructure analysis - Bragg's law for X-ray diffraction		BB, PPT
	Week 5	Pig iron, cast iron, carbon steel, alloy steels- Classification, properties, composition and applications.		BB, PPT
	Week 6	Important non-ferrous metals Zn, Sn, Mg, Ti, Ni, Composition, properties, classification and applications		BB, PPT
	Week 7	Zn, Sn, Mg, Ti, Ni, Composition, properties, classification and applications		BB, PPT
	Week 8	Introduction, Simple crystal structure, Classification- Traditional (clay-products, refractories, abrasives, cement) and Engineering Ceramics		BB, PPT
	Week 9	Glass Ceramics, Properties of ceramics, Application of Ceramics, Glasses, Glass structure, Properties and application of Glass, Types of glass		BB, PPT
	Week 10	Introduction, Classification and forms of Polymers, Thermosetting & thermoplastic polymer, types of polymerizations,		BB, PPT

		Molecular weight, Plastics, Natural rubber and synthetic rubber, Applications of polymeric materials		
	Week 11	Introduction, Classification & Applications, Dispersion-strengthened, Composites, Particulate Composites, Fiber-reinforced Composites: Influence of Fiber Length, Influence of Fiber Orientation and Concentration, The Fiber Phase		BB, PPT
	Week 12	The Matrix Phase, Polymer-Matrix. Composites, Metal-Matrix Composites, Ceramic - Matrix Composites, Carbon-Carbon Composites, Processing of Fiber-Reinforced Composites		BB, PPT
	Week 13	Smart materials (Shape memory material, Piezo electric material) Photoconductors,		BB, PPT
	Week 14	Bio-materials, Nano materials, Dielectric materials		BB, PPT
	Week 15	magnetic materials, metamaterials, Cryogenics, Optical Fiber		BB, PPT

Program Mapping (Metallurgy Engineering Department)

Sem	Subjects
1 st	<div>Calculus</div> <div>Engineering Physics</div> <div>Workshop</div> <div>IEM</div> <div>Environmental Science</div> <div>Material Science (OE)</div> <div>Technical Communication</div> <div>Engineering Graphics</div>
2 nd	<div>Differential Equations and Linear Algebra</div> <div>Engineering Chemistry</div> <div>Engineering</div> <div>Metallurgy for Non Metallurgists (OE)</div> <div>Structural Properties and Physics of Materials</div> <div>Engineering Graphics</div> <div>Advanced Material and Application (OE)</div> <div>Business Communication and Presentation Skills</div>
3 rd	<div>Probability, Statistics and Numerical Methods</div> <div>Management for Engineers</div> <div>Human Values and Professional Ethics</div> <div>Mineral Processing</div> <div>Metallurgical Thermodynamics</div> <div>Internship-I</div> <div>Physical Metallurgy</div>
4 th	<div>Iron Making</div> <div>Transport Phenomena</div> <div>Metal Casting and Solidification (OE)</div> <div>Recycled Materials (OE)</div> <div>Heat Treatment Principles and Practices</div> <div>Soft Skill and Interpersonal Comm.</div> <div>Personality Credit-1</div>
5 th	<div>Foundry Technology</div> <div>Steel Making</div> <div>Fuel Furnace and Refractories (EL)</div> <div>Environmental Pollution and its Control in Met. Ind. (EL)</div> <div>Non Ferrous Extractive Metallurgy</div> <div>Plastic Deformation of Metals</div> <div>Energy Economy and Waste Management- (OE)</div> <div>Internship-2</div>
6 th	<div>Metal Forming</div> <div>Phase Transformation</div> <div>Powder Metallurgy (Elective-1)</div> <div>Engineering Graphics</div> <div>Electrometallurgy and Corrosion</div> <div>Ind. Ceramics and Polymers (EL-2)</div> <div>Composite Materials (EL-2)</div> <div>Modelling of Metallurgical Processes (Elective-1)</div> <div>Metal Joining Processes</div> <div>Nano Technology (OE)</div> <div>Personality Credit-2</div>
7 th	<div>Differential Calculus and Matrix Algebra</div> <div>Alloy Design (EL)</div> <div>Advanced Ferrous Metallurgy (EL)</div> <div>Surface (EL)</div> <div>Internship-3</div> <div>Non Destructive Testing (EL) and (OE)</div> <div>Material Testing and Standards</div> <div>Selection of Material & Failure analysis (EL) & (OE)</div> <div>Advanced Foundry Technology (EL)</div>
8 th	<div>Project</div> <div>Engineering Graphics</div>

Nano Tec

Subject: Introduction to Engineering Materials

Program: B. Tech in Metallurgical Engineering				Subject Code: MME0103			Semester: I	
Teaching Scheme (Hours per week)				Examination Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credits	University Theory Examination	University Practical Examination	Continuous Internal Evaluation (CIE)-Theory	Continuous Internal Evaluation (CIE)-Practical	Total
3	0	0	3	16/40	0	24/60	0	100

Course Objectives

1. To evaluate different materials for engineering applications.
2. To categorize material according to their properties and requirement.
3. To classify materials and understand the importance of each material in order to find applications in other fields of engineering.

CONTENTS

UNIT-I

[10 hours]

Materials

Introduction, Engineering requirement of different materials, Classification of Engineering materials, Properties of engineering materials, Criteria for selection of materials for engineering application.

Crystal Physics

Structure of crystalline solids; Lattices, unit cells; atom size, co-ordination number, atomic packing factor., Indexing of directions and planes, notations, Interplanar spacing and angles, Crystal structure analysis - Bragg's law for X-ray diffraction.

UNIT-II

[10 hours]

Ferrous metals & Alloys

Pig iron, cast iron, carbon steel, alloy steels- Classification, properties, composition and applications.

Non-Ferrous Metals & Alloys

Important non-ferrous metals (Al, Cu, Pb, Zn, Sn, Mg, Ti, Ni,), Non-ferrous alloys (Cu alloys, Al alloys, Mg-alloys, Ni-alloys) – Composition, properties, classification and applications.

UNIT-III

[10 hours]

Ceramics

Introduction, Simple crystal structure, Classification- Traditional (clay-products, refractories, abrasives, cement) and Engineering Ceramics - Glass Ceramics, Properties of ceramics, Application of Ceramics, Glasses, Glass structure, Properties and application of Glass, Types of glass.

Polymers

Introduction, Classification and forms of Polymers, Thermosetting & thermoplastic polymer, types of polymerizations, Molecular weight, Plastics, Natural rubber and synthetic rubber, Applications of polymeric materials.

UNIT-IV

[10 hours]

Composites

Introduction, Classification & Applications, Dispersion-strengthened, Composites, Particulate Composites, Fiber-reinforced Composites: Influence of Fiber Length, Influence of Fiber Orientation and Concentration, The Fiber Phase, The Matrix Phase, Polymer-Matrix.

Composites, Metal-Matrix Composites, Ceramic - Matrix Composites, Carbon–Carbon Composites, Processing of Fiber-Reinforced Composites.

Advanced Materials

Smart materials (Shape memory material, Piezo electric material) Photoconductors, Bio-materials, Nano materials, Dielectric materials, magnetic materials, metamaterials, Cryogenics, Optical Fiber.

Course Outcomes

1. To apply the fundamentals of mass, matter and materials from daily life.
2. To acquaint the student with applications and properties of materials used from engineering aspects.
3. To apply student's knowledge about advanced materials to be used in futuristic applications.

Text Books

1. O. P. Khanna, "Material Science and Metallurgy", Dalpat Rai Publications, 2nd Edition, 2014, ISBN: 9789383182459.
2. R. K Rajput, "Engineering Materials", S. Chand Publications, 4th Edition, 2000, ISBN: 9788121919609.
3. W.D. Callister, "Material Science & Engineering – An Introduction", John Wiley Publishers, 7th Edition, 2007, ISBN: 9780471736967.

Reference Books

1. J. Shackelford, "Introduction to Materials Science for Engineers", Pearson-Prentice Hall Publications, 8th Edition, 2006, ISBN: 8131700909.
2. L.H. Vanvack, "Elements of Materials Science and Engineering", Pearson Education India, 6th Edition, 2002, ISBN: 8131706001.
3. D. Swarup, "Elements of Metallurgy", Rastogi Publications, 2005, ISBN: 8171338135.
4. V. Raghavan, "Materials Science and Engineering – A First Course", Prentice Hall India Learning Private Limited, 6th Edition, 2015, ISBN: 8120350928.

Web Resources

1. MOOC Course on "Materials Science and Engineering" (<https://www.edx.org/course/materials-science-engineering-misix-mse1x>)

Name of Institute: IITE

Name of Faculty: Dr. Jigna Panchal

Course code: MA0112

Course name: Multivariable Calculus

Credit points: 4

Offered Semester: I

Course coordinator (weeks 1 - 15)

Full name: Prof.Kinjal Shah

Department with siting location: Mathematics Department, ISHLS,4th floor

Bhanwar building, Indus University, Ahmadabad

Telephone: 3425

Email: kinjalshah.gd@indusuni.ac.in

Consultation times: 10 am – 12 pm

Course lecturer (weeks 1 - 15)

Full name: Dr. Jigna Panchal

Department with siting location: Mathematics, 4th floor, Bhanwar Building.

Telephone: 3424

Email:jignapanchal.gd@indusuni.ac.in

Consultation times: Wednesday: 2:00 to 4:00 PM

Students will be contacted throughout the session via mail with important information relating to this course.

Course Objectives

By participating in and understanding all facets of this course a student will:

- 1) To provide mathematical knowledge and skills needed to support their concurrent and subsequent engineering studies.
- 2) To provide an ability to apply knowledge of basic science and engineering fundamentals.
- 3) To provide an ability to undertake problem identification, formulation and solution.
- 4) To provide an ability to analyze different mathematical models within science and technology and work creatively, systematically and critically.
- 5) To provide an ability to find strategies for the solution of different types of mathematical models using knowledge about the possibilities and limitations of the different methods and tools.
- 6) To provide an ability to develop abstract, logical and critical thinking and the ability to reflect critically upon their work and work of others.

- 7) To provide an ability to insight their strengths and weakness as learners and to appreciate the value of errors or mistakes as powerful motivators to enhance learning and understanding.

Course Outcomes (CO)

Upon the successful completion of the course, students will be able to:

CO: 1	Develop mathematical knowledge and skills needed to support their concurrent and subsequent engineering studies.	BT-4
CO: 2	Describe an ability to undertake problem identification, formulation and solution.	BT-1
CO: 3	Evaluate the solution of different types of mathematical models using knowledge about the possibilities and limitations of the different methods and tools.	BT-5
CO: 4	Apply the knowledge of basic science and engineering fundamentals.	BT-3
CO: 5	Explain the concept of partial differentiation, differential calculus and vector algebra.	BT-2
CO: 6	Create different mathematical models within science and technology and work creatively, systematically and critically.	BT-6

Course Outline

Basics of Partial Derivatives and its applications, Vector Differential & integral Calculus.

Method of delivery

Chalk &Talk

Study time

4 Hrs/week

Blooms Taxonomy and Knowledge retention (For reference)

(Blooms taxonomy has been given for reference)

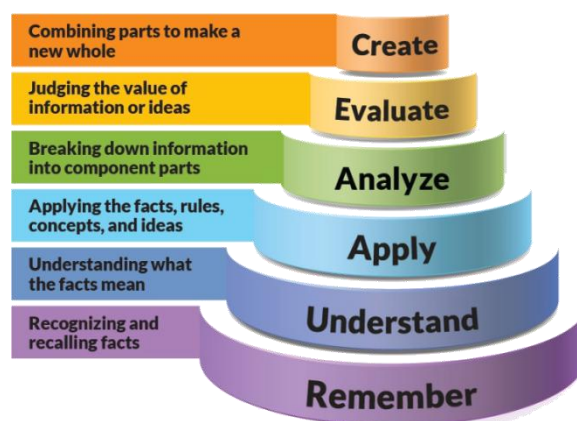


Figure 1: Blooms Taxonomy

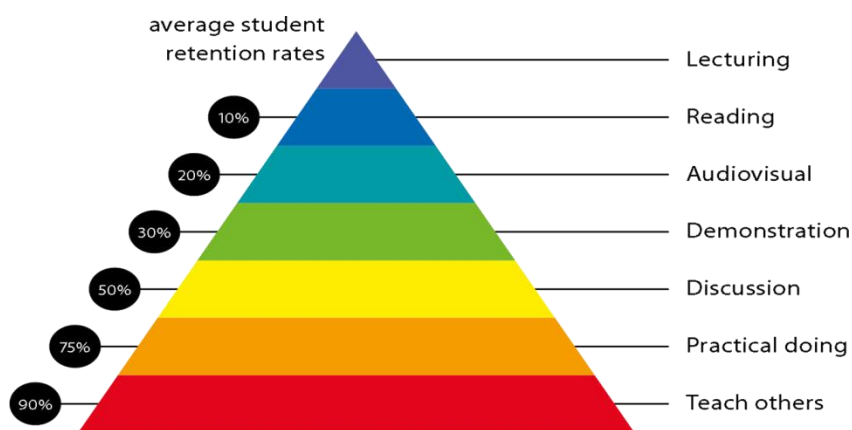


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered (Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of Metallurgical Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate	2 Information literacy, gathering & processing

information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	4 Problem solving skills
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	5 Written communication
	6 Oral communication
	7 Teamwork
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	10 Sustainability, societal & environmental impact

Practical work:

Not Applicable

Lecture/tutorial times

(Give lecture times in the format below)

Example:

Lecture	Monday 2.25 pm - 3:20 pm	Room: LH-13
Lecture	Tuesday 1:30 pm - 2:25 pm	Room: LH-13
Lecture	Thursday 9:55 am - 10:50 am	Room: LH-14
Tutorial	Wednesday 9:00 am - 9:55 am	Room: LH-14

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for semester examinations.

Details of referencing system to be used in written work

Text books

B. V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill.

Additional Materials

Reference Books:

1. Erwin Kreyszig, "Advanced Engineering Mathematics" (8th Edition), Wiley Eastern Ltd., New Delhi.
2. Dr. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi
3. Murray Spiegel, "Advanced Mathematics for Engineering & Science: Schaum's Outline Series", Tata McGraw Hill Publication
4. MerelC Potter, J.L. Goldberg, "Advanced Engineering Mathematics" (3rd Edition), Oxford India Publication.

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

Internal Exam	60%	Objectives (2-5) (20 Marks- Class Test-1, 20 Marks - Class Test-2, 5 Marks- Attendance, 5 Marks Assignment, 10 Marks Quiz)
Final exam (<i>closed book</i>)	40%	Objectives (1-5)

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in internal component or less than 40% in the end semester will be considered for supplementary assessment in the respective components (i.e internal component or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (internal component or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -% of the maximum mark per calendar day

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course schedule (subject to change)

(Mention quiz, assignment submission, breaks etc as well in the table under the Teaching Learning Activity Column)

	Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
	Weeks 1	Partial Differentiation Variable Treated as Constant	Apply the knowledge of multivariable calculus and partial differentiation for solving various practical & engineering problems.	Chalk & Talk, Assignment Submission , Unit Test.
	Weeks 2	Total Derivative, Partial Differentiation of Composite Functions: Change of Variable, Jacobian	Apply the knowledge of multivariable calculus and partial differentiation for solving various practical & engineering problems.	Chalk & Talk, Assignment Submission , Unit Test.
	Week 3	Maxima and Minima of Functions of two Variables: with and without constraints, Lagrange's Method of Undetermined Multipliers	Apply the basic concept of partial derivatives and their applications. Apply the knowledge of Lagrange's method of undetermined multipliers.	Chalk & Talk, Assignment Submission , Unit Test.
	Week 4	Reduction formula, Curve tracing	Using some properties of the curve, one can identify the curve	Chalk & Talk, Assignment Submission , Unit Test.
	Week 5	Double Integral, Change of order, Change of variables,	Find the solution of different types of mathematical models using knowledge about the possibilities and limitations of the different methods and tools.	Chalk & Talk, Assignment Submission , Unit Test.
	Week 6	Triple integral, Application of multiple integrals	Apply the knowledge to find multiple integration	Chalk & Talk, Assignment

				Submission , Unit Test.
Week 7	Curvilinear coordinate system, Cartesian, Spherical and Cylindrical coordinate system	Apply the Knowledge of Curvilinear coordinate system.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 8	Vector Differentiation, Directional Derivative, Gradient of a Scalar Function and Conservative Field	Apply the Knowledge of vector differentiation for Directional derivative and Conservative field.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 9	Directional Derivative, Gradient of a Scalar Function and Conservative Field	Apply the Knowledge of vector differentiation for Directional derivative and Conservative field.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 10	Divergence and Curl, Related Properties of Gradient, Sums of Divergence and Curl	Apply the Knowledge of vector differentiation for Directional derivative and Conservative field.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 11	Vector Integration: Integration of a Vector Function of a Scalar Argument	Apply the Knowledge of Vector Integration and Line Integral.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 12	Line Integrals: Work Done, Potential, , Conservative Field and Area	Apply the Knowledge of Vector Integration and Line Integral.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 13	Introduction to Surface Integrals, Volume Integrals	Apply the Knowledge of Vector Integration and Line Integral.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 14	Green's Theorem in Plane, Stokes' Theorem	Apply the Knowledge of Vector Integration and Line Integral.	Chalk & Talk, Assignment Submission , Unit Test.	
Week 15	Gauss Divergence Theorem	Apply the Knowledge of Vector Integration and Line Integral.	Chalk & Talk, Assignment Submission	

PROGRAM MAP for Bachelor of Engineering
(Department of Mathematics, ISHLS)

Subject Mind Mapping

Sr. No.	Semester	Course Name	Compulsory/Open Elective
1	I	Calculus	Compulsory
2	II	Linear Algebra and Differential Equations	Compulsory
3	III	Probability , Statistics and Numerical methods	Compulsory
4	IV	Complex Analysis / Discrete Mathematics	Open elective
5	V	Finite Element method	Open elective
6	VI	Graph Theory	Open elective
7	VII	Optimization Techniques / Artificial neural network and soft computing	Open elective

Name of Institute: INDUS INSTITUTE OF TECHNOLOGY & ENGINEERING

Name of Faculty: Prof. Zankar Yadav

Course code: ME0112

Course name: Workshop Practice

Pre-requisites: Basic Engineering Principles

Credit points: 02

Offered Semester: 1st

Course Coordinator (weeks 14 - 16)

Full Name: **Prof. Zankar Yadav**

Department with sitting location: Ground Floor, Mechanical Workshop, IITE

Telephone: 8511225519

Email: zankarvyadav.me@indusuni.ac.in

Consultation times: 09.00 AM – 11.00 AM (Working Saturdays),

04:15 PM _ 05:00 PM (Monday to Friday)

Students will be contacted throughout the Session via Mail with important information relating to this Course.

Course Objectives

By participating in and understanding all facets of this Course a student will:

1. Recognize the importance of Workshop in today's technology and its impacts on market competition.
2. Understand basic of various methodologies to manufacture components/structure.
3. Understand different tools and equipments used in mechanical workshop.
4. Analyze the engineering and economical aspects of workshop practices.

Course Outcomes (CO)

After learning the course, the students should be able to:

1. Prepare basic joints used in carpentry.
2. Prepare edges for better joint for fitting.
3. Prepare better joint for welding.
4. Prepare various shapes and objects by using Carpentry, Fitting, and Welding.

Course Outline

1 Introduction to Mechanical Workshop

Introduction, Safety rules in Mechanical workshop, Safety slogans, Tools and Equipment used for safety in Mechanical workshop.

2 Workshop Layout

Introduction, Types of layouts, Rules and regulations for Workshop layouts and Preparation of actual layout.

3 Fitting Shop

Introduction, Classification and characteristics of Engineering Materials, Tools and Equipment for Fitting shop, Different operations, preparation of job in Fitting shop.

4 Carpentry Shop

Introduction, Wooden Materials, Tools and Equipment for Carpentry shop, Different operations, preparation of job in Carpentry shop.

Method of delivery

Face to face lectures, self study material, PPT, Web Resources

Study time

4 hours/Week

CO-PO Mapping (PO: Program Outcomes)

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

CO2	3	2	3	1	3	-	-	-	-	-	-	-
CO3	3	2	2	2	3	-	-	-	-	-	-	-

Blooms Taxonomy and Knowledge retention (For reference)

(Blooms taxonomy has been given for reference)

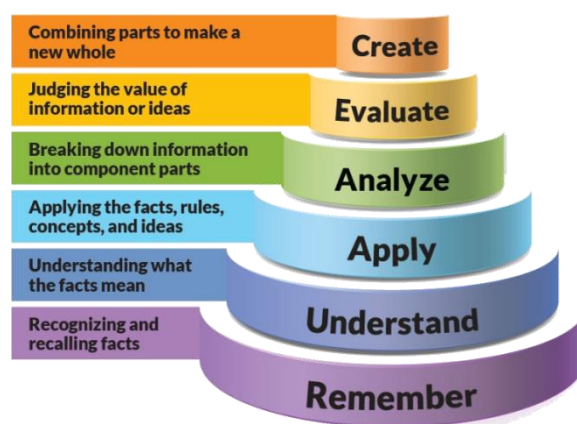


Figure 1: Blooms Taxonomy

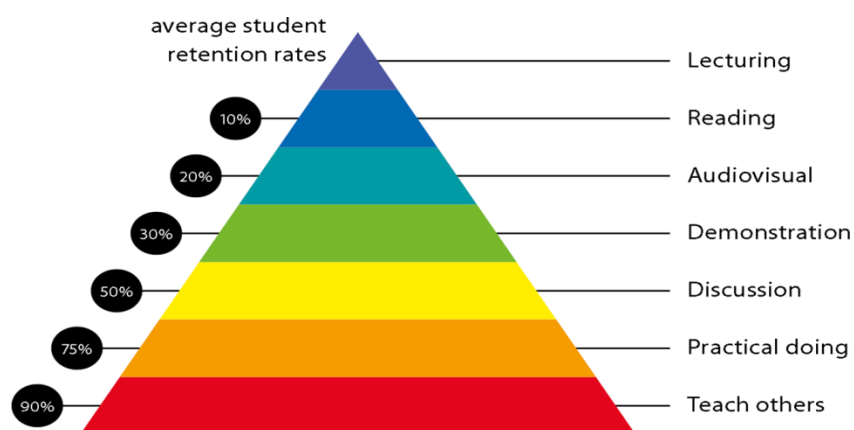


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of Mechanical Engineering Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area	1 Professional knowledge, grounding & awareness

of study has developed and how it relates to other areas.	
Independent learners Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	2 Information literacy, gathering & processing
Problem solvers Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.	4 Problem solving skills
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.	5 Written communication
	6 Oral communication
	7 Teamwork
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	10 Sustainability, societal & environmental impact

Practical work:

1. To study about safety rules in Mechanical Workshop.
2. To study about Workshop layout and preparation of actual layout of Mechanical Workshop.
3. To study about Fitting shop and preparation of job.
4. To study about Carpentry shop and preparation of job.
5. To study about Tin Smithy shop and preparation of job.

Lecture/tutorial times

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for semester examinations.

Details of referencing system to be used in written work

PPTs, Lecture Notes/E-book, Web-Resources.

Text books

1. Elements of Mechanical Engineering - Hajra Choudhury & others, Media Promoters 2010 .
2. The Elements of Workshop Technology - Volume I & II, S.K. Hajra choudhury, A.K. Hajra Choudhury, Nirjhar Roy, 11th edition 2001 others, Media Promoters and Publishers, Mumbai.

ASSESSMENT GUIDELINES

Your final course mark will be calculated from the following:

CIE Practical 60 Marks Bifurcation	
10 Marks	Attendance & Lab Participation
10 Marks	File work/ Journal write up – calculation etc. in lab. itself
10 Marks	Fitting job
10 Marks	Carpentry job
10 Marks	Tin smithy job
10 Marks	Question Answer

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in internal component or less than 40% in the end semester will be considered for supplementary assessment in the respective components (i.e internal component or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (internal component or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

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Format

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University and Faculty Policies

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B.TECH MECHANICAL ENGINEERING (2019)

