



Integral University, Lucknow

Effective from Session:							
Course Code	PY101	Title of the Course	Physics	L	T	P	C
Year	1	Semester	1	3	1	0	
Pre-Requisite	10+2 with Physics and Mathematics	Co-requisite					
Course Objectives	The purpose of this undergraduate course is to impart basic knowledge of fundamental concept of physics which is necessary for a strong engineering knowledge base.						

Course Outcomes	
CO1	To analyze the connection between daily life observations and science. To realize that apparently different ideas of Optics such as Interference and Diffraction have interrelationship between them. To realize the simplicity of ideas involved in explaining complex phenomenon.
CO2	To grow in ideas of different aspect of light and develop connection between daily life applications and science. To analyze the process of development of a new theory while dealing with Polarization. To correlate that the conceptualization of an idea is far ahead than its practical realization while dealing with LASER. To grow in realization of totally different manifestation of light. To find the most recent applications of light in terms of communication and storage of data. To realize that how the design of complex systems is based on the simple ideas. To realize that the conceptualization of an idea is far ahead than its practical realization while dealing with Optical Fibers.
CO3	To grow in developing connection between philosophy and science. To find that seemingly different ideas such as Optics and Mechanics have interrelationship between them. To understand the process of development of a new theory and its application in life. To realize the requirement of power of imagination.
CO4	To grow in developing the connection between philosophy and science. To find that seemingly different ideas such as Compton Effect and Quantum Theory have interrelationship between them. To understand and analyze the process of development of a new theory and how the development of one idea leads to the development of a apparently different idea. To realize and appreciate the efforts made by the individuals to give a new understanding of science that led to the modern day applications.
CO5	To grow in developing connection between daily life utility and material science. To realize that apparently different materials with respect to Electric and Magnetic properties have inter relationship between them. To evaluate that how totally different manifestation of Modern Science leads to new technology. To do the evaluation that how an idea is far ahead than its practical realization while dealing with Nano Technology and Super Conductivity.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Wave Optics	Methods of formation of coherent sources, Fresnel's Bi-prism, displacement of fringes, thin film interference, Newton's ring. Fraunhofer diffraction at single slit, grating, Rayleigh's criterion of resolution, resolving power of grating.	8	CO1
2	Optical Activity and Modern Optics	Production of plane polarized light by reflection and Double refraction, Nicol prism, Optical activity, polarimeter(Laurent's and Bi-quartz). Principle of fiber optics, numerical aperture, attenuation, dispersion in optical fibers, material dispersion, waveguide dispersion, intermodal and intra-modal dispersion, Pulse dispersion in step index fiber. Main components of laser, Einstein's coefficients, He-Ne laser, Nd-YAG laser and their applications.	8	CO2
3	Properties of Matter and Relativistic Mechanics	Viscosity, Poiseulli's equation, Michelson-Morley experiment and its implications, Galilean transformation equations, Lorentz transformation equations and their consequences, energy mass relation, relativistic kinetic energy.	8	CO3
4	Quantum Physics	Compton effect, basic postulates of quantum mechanics, Wave function and its physical admissibility, orthogonality of wave functions, normalization of wave functions, Heisenberg's uncertainty principle (no derivation) and its applications (non-existence of electron in nucleus, Bohr's radius), Schrodinger's equation and its application to free particle, particle in one dimensional box	8	CO4
5	Physics of Materials	Magnetic Properties: Magnetization, Origin of magnetic moment, dia, para and ferro magnetism, Langevin's theory for diamagnetic material, Phenomena of hysteresis and its applications. Superconductors: Temperature dependence of resistivity in superconducting materials, Effect of magnetic field (Meissner effect), Temperature dependence of critical field, Type I and Type II superconductors, BCS theory (Qualitative), High temperature superconductors and Applications of Super-conductors. Nano-Materials: Basic principle of nanoscience and technology, structure, properties and uses of Fullerene and Carbon nanotubes, Applications of nanotechnology.	8	CO5

Reference Books:

1. Fundamentals of Optics by Jenkins and White
2. Optical Fiber Communication by Gerd Keiser
3. Concepts of Modern Physics by Arthur Beiser
4. Introduction to Special Theory of Relativity by Robert Resnick

5. Quantum Physics by Eisberg
6. Introduction to Nanotechnology by Poole Owens, Wiley India
7. Solid State Physics by S.O. Pillai, New Age Publications
e-Learning Source:
1. https://nptel.ac.in/courses/115/101/115101011/
2. https://nptel.ac.in/courses/115/107/115107095/
3. https://nptel.ac.in/courses/113/106/113106093/
4. https://nptel.ac.in/courses/115/101/115101107/

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO5	PSO6	PSO7
CO1	0	3	2	1	3	3	1	3	2	2	1	3	2	1	1	-	-	-
CO2	3	3	2	1	3	3	1	2	2	3	2	3	2	1	1	-	-	-
CO3	3	3	3	3	1	3	1	3	2	2	1	3	2	1	1	-	-	-
CO4	3	3	3	2	2	3	1	2	2	1	1	3	2	1	1	-	-	-
CO5	3	3	3	3	3	3	3	2	2	2	3	3	2	1	1	-	-	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2020-21							
Course Code	LN101	Title of the Course	Basic Professional Communication	L	T	P	C
Year	I st	Semester	I/II	2	1	0	3
Pre-Requisite	10+2	Co-requisite	U.G. Program				
Course Objectives	<ul style="list-style-type: none"> The course aims to educate the students in both the artistry and utility of the English language for professional purposes through the study of language and literature. The key component of the various types of professional communication is basically communication in the English language which is now a global language. The Department of Languages caters to the needs of the students aspiring for training, expertise and excellence in professional communication with a marked emphasis on English for Specific/Special Purposes (ESP). 						

Course Outcomes	
CO1	Students will be introduced to the basic understanding of communication and Professional Communication. Knowledge of Professional, cultural and cross-cultural communication will be imparted. Meaning and process of communication, verbal and nonverbal communication will be focused.
CO2	Learning Language through literature aims to develop the students' ability to read the prescribed essays and stories critically and to understand the historical-political and cultural dynamics underlying them.
CO3	Basic tools of communication and improvement in communicative competence.
CO4	Understanding the structural and functional grammar and basic structure of language.
CO5	Enhancement of writing skills in English i.e., writing application, report and various types of letters.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Professional Communication	Professional Communication: Its Meaning and Importance, Essentials of Effective Communication, Barriers to Effective Communication	8	CO 1
2	Language through Literature	A. Essays: 1. The Effect of Scientific Temper on Man by Bertrand Russell 2. The Aim of Science and Humanities by Moody E. Prior B. Short Stories: 1. The Meeting Pool by Ruskin Bond 2. The Portrait of a Lady by Khushwant Singh	8	CO 2
3	Basic Vocabulary	Euphemism, One-word Substitution, Synonyms, Antonyms, Homophones, Idioms and Phrases, Common Mistakes, Confusable Words and Expressions, Portmanteau Words, Foreign Words and Expressions.	8	CO 3
4	Basic Grammar	Articles, Prepositions, Tenses, Concord, (Subject-Verb agreement), Modal Auxiliaries, Verbs: its Kinds and uses, Degrees of Comparison, Punctuation	8	CO 4
5	Basic Composition	Report Writing: What is report? Kinds and Objectives of reports, writing reports, Business Letter writing; Introduction to Business Letters, Layout of Business letters, Letters of Enquiry/Complaint Proposal writing	8	CO 5

Reference Books:

1. Gerson, Sharon J. *Technical Writing: Process and Product* (5th edition). Prentice Hall, 2005.
2. K. Floyd, *Interpersonal Communication: The Whole Story*. McGraw Hill, 2009.
3. Greenbaum, Sidney and Nelson Gerald, *An Introduction to English Grammar*. Routledge, 2009.
4. Swan, Michael, *Practical English Usage*. OUP, 2005.
5. Murphy, Raymond. *English Grammar in Use*. Cambridge University Press, 2019.
6. Kumar, Sanjay and Pushp Lata., *Communication Skills*. Oxford University Press, Oxford 2011.
7. Raman, Meenakshi, and Sangeeta Sharma. *Technical Communication: Principles and Practice*. Second Edition, Oxford University Press, 2012.
8. Gerson, Sharon J. *Technical Communication: Process and Product* (9th edition). Longman Pub., 2016.


e-Learning Source:

1. <http://www.uptunotes.com/notes-professional-communication-unit-i-nas->
2. <https://www.doccity.com/en/subjects/professional-communication/>
3. <https://lecturenotes.in/download/note/22690-note-for-communication-skills-for-profession...>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Teaching and Learning methods	Flipped Classrooms, Concept Mapping, Information-Based Approach, Personal-Response Approach, Language-Based Approach, Paraphrastic Approach, Moral-Philosophical Approach and Stylistics Approach
List/Topics/Activities Planned that are beyond Syllabus	Information-Based Activities, Personal-Response Activities, Language-Based Activities, Periphrastric Activities, Moral-Philosophical Activities, and Stylistics Activities

 Dr. Syed Wahaj Mohsin Name & Sign of Program Coordinator	 Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2017 - 18							
Course Code	MT101	Title of the Course	Engineering Mathematics - I	L	T	P	C
Year	I	Semester	I	3	1	0	4
Pre-Requisite	10+2 Mathematics	Co-requisite					
Course Objectives	The course is aimed to develop the skills in mathematics which is necessary for grooming them into successful engineering graduate. The topics introduced will serve as basic tools for specialized studies in science field.						

Course Outcomes	
CO1	Able to calculate rank of matrix, characteristic equation & characteristic roots & use the applicability of Cayley Hamilton Theorem to find inverse of matrix which is very important in many engineering application.
CO2	To develop ability to solve higher derivative, expansion of functions in ascending power of variable & partial derivatives.
CO3	Develops ability to solve Jacobian, error and approximation and Extrema of the function.
CO4	Learn the evaluation policy of some special function like gamma & Beta function. & their relation which is helpful to evaluate some definite integral arising in various branch of Engineering.
CO5	Able to determine vector differentiation and integration.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Unit I	Introduction, Different types of matrices, Algebraic operations, Elementary row and column transformations, Rank of matrix, Linear dependence, Consistency of linear system of equations, Characteristic equation, Cayley-Hamilton theorem, Eigen values and eigen vectors.	8	1
2	Unit II	Leibnitz theorem, Partial differentiation, Homogeneous functions, Euler's theorem, Expansion of functions of one and two variables.	8	2
3	Unit III	Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (simple applications).	8	3
4	Unit IV	Double and triple integrals, Change of order of integration, Gamma and Beta functions, Applications to area and volume, Dirichlet's integral and its applications.	8	4
5	Unit V	Scalar and Vector point functions, Gradient of a scalar function, Directional derivative, Divergence and Curl of a vector, Line, Surface and Volume integrals, Green's, Stoke's and Gauss divergence theorems (without proof).	8	5

Reference Books:

1. A Text Book of Matrices, S. Chand & Co. New Delhi
2. Calculus and Analytical Geometry, Narosa Publishing House, New Delhi
3. Higher Engineering Mathematics, Khanna, Publishers, Pvt. Ltd
4. Advanced Engineering Mathematics, Khanna Publication

e-Learning Source:

- <https://nptel.ac.in/courses/122104018/>
- <https://nptel.ac.in/courses/111104092/>
- https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/111104092/lec21.pdf
- <https://nptel.ac.in/courses/111107108/>

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	CO1	3	2	1	2	2	1				1		2	1	1	
CO2	3	2	1	2	2	1						2	1	1		
CO3	3	2	1	1	1	1						2	1	1		
CO4	3	2	1	2	3	1				1		2	1	1		
CO5	3	1	1	1	2	1						2	1	1		

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2022-2023							
Course Code	EE103	Title of the Course	Basic Electrical Engg.	L	T	P	C
Year	1 st	Semester	1 st	3	1	0	4
Pre-Requisite	None	Co-requisite	None				
Course Objectives	<ul style="list-style-type: none"> Knowledge and concept of D.C Circuit Analysis and Network Theorems Circuit. Use of Steady State Analysis of Single-Phase AC Circuits AC fundamentals. Knowledge and concept of Three Phase AC Circuits Three phase system and measuring devices. Basic concepts of Power System and Transformer Study of Electromechanical energy conversion devices: AC/ DC Machines. 						

Course Outcomes	
CO1	Know about the concept of D.C Circuit Analysis and Network Theorems Circuit.
CO2	Steady State Analysis of Single Phase AC Circuits AC fundamentals.
CO3	Know about concept of Three Phase AC Circuits Three phase system and measuring devices
CO4	Layout of Power System and transformer
CO5	Know about Electromechanical energy conversion devices: AC/ DC Machines

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	D.C Circuit Analysis and Network Theorems	Circuit concepts: Concept of network, Active and passive elements, linear network and non linear network, unilateral and bilateral elements, lumped and distributed network, sources, open circuit and short circuit, source transformation, Kirchhoff's Law. Loop analysis and nodal analysis, star delta transformation. Network theorems: Needs of theorem, Superposition theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem.	8	CO1
2	Steady State Analysis of Single Phase AC Circuits	AC fundamentals: Average and effective value of Sinusoidal waveform , form factor and peak factor, concept of phasors, phasors representation of sinusoidally varying voltage and current, analysis of series RLC circuits. Apparent, active and reactive powers, power factor, causes and problems of low power factor, power factor improvement, resonance, bandwidth and quality factor in series circuit.	8	CO2
3	Three Phase AC Circuits	Three phase system: Its necessity and advantages, meaning of phase sequence, star and delta connections, balanced supply, line and phase voltage/current relationship. Measuring Instruments: Types of instruments: construction and working principle of PMMC, MI type instruments, induction type energy meter.	8	CO3
4	Introduction of Power System	General layout of electrical power system, standard generation, transmission and distribution voltage levels, concept of grid. Magnetic circuit: Concepts, analogy between electric and magnetic circuit. Single Phase Transformer: Principle of operation, construction, emf equation, equivalent circuit, losses, efficiency, Introduction to auto transformer.	8	CO4
5	Electromechanical energy conversion devices	DC Machines: Types, emf equation of generator and torque equation of motor, applications. Three Phase Induction Motor: Types, principle of operation, applications. Single Phase Induction Motor: Principle of operation and introduction to methods of starting, applications. Three Phase Synchronous Machines: Principle of operation of alternator, synchronous motor, applications.	8	CO5

Reference Books:	
1.	V.Deltoro, "Principle of Electrical Engg." PHI, 2009..
2.	M.A Mallick, Dr. I. Ashraf, "Fundamental of Electrical Engg," CBS Publishers, 2010.
3.	A. Hussain, "Basic Electrical Engg" Dhanpat Rai & sons, 2007
4.	I J Nagrath, "Basic Electrical Engg" ,TMH, 2010.
e-Learning Source:	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
	CO1	3	3	2	1	1	3						3	3	3	2	3	
CO2	3	3	3	2	1	1						2	3	2	2	3		
CO3	3	2	1	1	2	2	3					3	2	2	2	3		
CO4	3	2	2	2	3	3						2	3	2	2	3		
CO5	3	1	1	1	1	2	1					2	3	2	2	3		

CO																		
CO1	3	1	3	0	0	0	0	0	3	0	0	1	3	2	0	0	3	1
CO2	3	2	3						3			1	3				3	2
CO3	3	3	3	1	1				3				3	2	0	0	3	3
CO4	3	3	2						3			1	3				3	3
CO5	3	2	2	1	1				3			1	3	2	0	0	3	2

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session:							
Course Code	PY104	Title of the Course	Physics Lab	L	T	P	C
Year	1	Semester	1	0	0	6	
Pre-Requisite	10+2 with Physics and Mathematics	Co-requisite					
Course Objectives	The purpose of this undergraduate course is to impart practical knowledge of the concepts through different experiments related to its theoretical course.						

Course Outcomes	
CO1	To demonstrate how interference takes place by division of amplitude and by division of wavefront.
CO2	To demonstrate the practical applications of polarization phenomenon in finding the specific rotation, refractive index and Brewster's angle.
CO3	To demonstrate the practical application of Fraunhofer diffraction in wavelength and focal length calculation.
CO4	To demonstrate the magnetic and heating effect of current in finding the magnetic field and Stefan's constant.
CO5	To demonstrate how to calculate the energy band gap of a semiconductor material and viscosity of a liquid.

List of experiments	Content of Unit
Exp.1	To determine the wave length of monochromatic light by Newton's ring.
Exp.2	To determine the wave length of monochromatic light with the help of Fresnel's Biprism.
Exp.3	To determine the focal length of two lenses by nodal slide and locate the position of cardinal points.
Exp.4	To determine the specific rotation of cane sugar solution using Half Shade polarimeter.
Exp.5	To determine the wavelength of spectral lines using plane transmission grating.
Exp.6	To determine the Brewster's angle and refractive index of material with the help of a laser source.
Exp.7	To determine the variation of magnetic field along the axis of a current carrying coil and then to estimate the radius of the coil.
Exp.8	To verify Stefan's law by electrical method.
Exp.9	To determine the energy band gap of a given semiconductor material.
Exp.10	To determine the coefficient of viscosity of a liquid.

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO5	PSO6	PSO7
	CO1	3	3	2	1	3	1	3	-	-	-	-	-	2	1	1	-	-
CO2	2	2	2	2	2	3	2	-	-	-	-	-	2	1	1	-	-	-
CO3	3	3	1	3	3	1	3	-	-	-	-	-	2	1	1	-	-	-
CO4	2	2	2	3	1	2	2	-	-	-	-	-	2	1	1	-	-	-
CO5	2	1	1	1	2	2	2	-	-	-	-	-	2	1	1	-	-	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2017-18							
Course Code	EE104	Title of the Course	Electrical Engineering Lab	L	T <th style="width: 5%;">P</th> <td style="width: 5%;">C</td>	P	C
Year	I	Semester	I/II	0	0	2	1
Pre-Requisite		Co-requisite					
Course Objectives	<ul style="list-style-type: none"> To understand and experiment with the verification of DC Network Theorems To understand and experiment with the study of diode, rectifier, BJT characteristics and Amplifier To understand and experiment with the study of resonance and determination of transformer losses To understand and experiment with the calibration of energy meter and operation of induction motor 						

Course Outcomes	
CO1	Adopt, perform, analyze and implement the methods of verification of DC Network Theorems; contribute in related development
CO2	Adopt, perform, analyze and implement the methods of study of diode, rectifier, BJT characteristics and Amplifier; contribute in related development
CO3	Adopt, perform, analyze and implement the methods of study of resonance and determination of transformer losses; contribute in related development
CO4	Adopt, perform, analyze and implement the methods of calibration of energy meter and operation of induction motor; contribute in related development

Unit No.	Title of the Unit	Content of Experiment	Contact Hrs.	Mapped CO
1.		Verification of Thevenin's Theorem.	2	1
2.		Verification of Superposition Theorem.	2	1
3.		Verification of Maximum Power Transfer Theorem.	2	1
4.		To study V-I characteristics of diode.	2	2
5.		To study the input & output characteristics of BJT in CE configuration.	2	2
6.		To study the full wave rectifier circuit with & without filter and determine the ripple factor.	2	2
7.		To study the phenomenon of resonance in series RLC circuit.	2	3
8.		Determination of losses in single phase transformer by OCT and SCT.	2	3
9.		To calibrate a single-phase induction type energy meter.	2	4
10.		To study the running and reversing of a three phase SCIM.	2	4
11.		Study of OP Amp based inverting and non-inverting amplifier	2	2

Reference Books:

1. V.Deltoro, "Principle of Electrical Engg." PHI, 2009.
2. M.A Mallick, Dr. I. Ashraf, "Fundamental of Electrical Engg," CBS Publishers, 2010.
3. A. Hussain, "Basic Electrical Engg" Dhanpat Rai & sons, 2007.
4. R. Boylestad, "Electronic Devices and Circuit Theory", Pearson, 2013.

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	1	1	3						3	3	3	2	3
CO2	3	3	3	2	1	1						2	3	2	1	3
CO3	3	2	1	1	2	2	3					3	3	3	2	3
CO4	3	2	2	2	3	3						2	3	2	2	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator

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Integral University, Lucknow

Effective from Session: 2015-16							
Course Code	ME103	Title of the Course	ENGINEERING GRAPHICS	L	T	P	C
Year	I	Semester	I/II	0	0	2	1
Pre-Requisite	None	Co-requisite	None				
Course Objectives	<ul style="list-style-type: none"> Main objective is to teach the fundamentals of Engineering Graphics. This course enhances visualization skill and imagination power. To understand techniques of drawings for various fields of engineering To improve their technical communication skill in the form of communicative drawings. 						

Course Outcomes	
CO1	Describe the fundamentals of engineering drawing, use of geometrical instruments and drawing steps
CO2	To understand the concept of projection and acquire visualization skills, draw the projection of points, lines and planes.
CO3	Classify solids and projection of solids at different positions
CO4	To get the exact sectioned view of solids and development of their surfaces.
CO5	To draw isometric projection and perspective views of an object.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Lettering and geometrical constructions	Describe the fundamentals of engineering drawing, use of geometrical instruments and layout for initial drawing.	2	CO1
2	Orthographic projections of points	Describe the fundamentals orthographic projections and use of geometrical instruments and layout for initial drawing.	2	CO2
3	Projections of lines	Describe the fundamentals of projections of lines and use of geometrical instruments and procedure for the drawing.	2	CO2
4	Projections of solids	Describe the fundamentals of projections of solids and use of geometrical instruments and procedure for the drawing.	2	CO3
5	Sectioning of solids	Describe the fundamentals of sectioning of solids and use of geometrical instruments and procedure for the drawing.	2	CO4, CO3
6	Isometric Projections	Describe the fundamentals of Isometric projections and use of geometrical instruments and procedure for the drawing.	2	CO5
7	Production drawing	Describe the fundamentals of production drawing.	2	CO1, CO2

Reference Books:	
Engineering graphics by Pradeep Jain	
Engineering graphics by Krunal Patel	
e-Learning Source:	
https://www.youtube.com/watch?v=p62LPzFqGQw&list=PLp6ek2hDcoNCjoRLO4ripCozisCACBxKA	
https://www.youtube.com/watch?v=VrU73IwRvc4&list=PLLy_2iUCG87Bw9XPfEF3r3EW5UIAOv8iz	

Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3								1	2		3	3		3
CO2	3	2	2						1	2		3	3		3
CO3	3	2	2						1	2		3	3		3
CO4	3	2	2						1	2		3	3		3
CO5	3	2	2						1	2		3	3		3

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Integral University, Lucknow

Effective from Session: 2015-16							
Course Code	ME104	Title of the Course	WORKSHOP PRACTICE	L	T	P	C
Year	I	Semester	II	0	0	2	1
Pre-Requisite	None	Co-requisite	None				
Course Objectives	<ul style="list-style-type: none"> To impart practical knowledge and hands-on practice on the lathe machine. To impart practical knowledge of basic tools and operations in the fitting shop and carpentry shop. To impart basic knowledge of smithy tools and hands-on practice in smithy shop. To impart basic knowledge of different welding tools and equipment and hands-on practice of making different welding joints. 5. To impart practical knowledge of different types of sheet metal tools and equipments and hands-on practice of making sheet metal components. 						

Course Outcomes	
CO1	Perform different operations on lathe machine.
CO2	Manufacture components using tools and equipments of fitting shop and carpentry shop.
CO3	Make components in smithy shop using different types of smithy tools and equipments.
CO4	Perform different joining operations using welding tools and equipments.
CO5	Make sheet metal components using different sheet metal tools and equipments.

Exper iment No.	Title of the experiment	Content of Unit	Contact Hrs.	Mapped CO
1	Lathe machine	To study and sketch a lathe machine Practice of operations - facing, plain turning, step turning, Taper turning & chamfering	2	CO1
2	Fitting shop & carpentry shop	To study and sketch fitting tools and equipment Practice of step cutting, filing, drilling & tapping To make a 90° v-groove fitting on mild steel flat To study and sketch different types of carpentry tools & machines To make a mortise and tenon joint To make a corner lap joint	2	CO2
3	Smithy shop	To study and sketch different smithy tools & equipments To make a squire punch from mild steel round rod To make a pipe hook from a mild steel round rod	2	CO3
4	Welding shop	To study and sketch the welding equipments and tools To weld the two given plates & make a lap joint (by arc welding) To weld the two given plates & make a butt joint (by arc welding)	2	CO4
5	Sheet metal	To study and sketch different sheet metal tools & equipments To make a rectangular tray To make a conical funnel	2	CO5

e-Learning Source:

<https://www.vlab.co.in/>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)															
PO- PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO4
CO1	3	2	2	3	3	2			2		2	3	3	2	3
CO2	3	2	2	2	2	2			2		2	3	3	2	3
CO3	2	2	2	2	2	2			2		2	3	3	2	3
CO4	2	2	2	2	3	2			2		2	3	3	2	3
CO5	2	2	2	2	2	2			2		2	3	3	2	3

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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