



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Applied Science (Physics)

Semester/Year		I/II	Program			B.Tech				
Subject Category	BS	Subject Code:	PYB101	Subject Name:		Applied Physics				
Maximum Marks Allotted							Contact Hours			Total Credits
Theory				Practical		Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	Assignment	End Sem	Lab-Work					
60	20	10	10	30	20	150	3	0	1	4
Prerequisites:										
Intermediate Physics (Theory and Lab)										
Course Objective:										
This course is designed to impart fundamental knowledge about some areas of physics which are to the core of emerging technologies. It is planned to provide knowledge about Quantum mechanics, Lasers, Fiber Optics, Holography, Superconductor, Nano materials, Dielectric and piezoelectric materials. Laboratory sessions are also designed which are blended with experiments on the fundamental and advanced areas of physics.										
Course Outcomes:										
After completion of the course, students will be able										
CO1	To understand basic quantum physics and apply it to the behaviour of a system at the microscopic level and solve the problems.									
CO2	To understand process of lasers and explain the requirements, properties, classification of various lasers. They will also develop an understanding of optical fibers and holography and can explain the characteristics, various losses, dispersion in optical fibers and processes of construction and reproduction of holograms.									
CO3	To understand the basic concepts and theory of semiconductor for devices application.									
CO4	To understand and know the principle of superconductors and nanomaterials. The student will be able to explain types of superconductors, their properties and applications, nano technology and its applications.									
CO5	To understand the characteristic of Dielectrics and Piezoelectric materials in terms of their applications.									
CO6	To perform experiments related to the course contents.									
UNITs	Descriptions						Hrs.	CO's		
I	Quantum mechanics: Planck's quantum hypothesis, Wave-particle duality of radiation, de-Broglie matter waves, Davisson and Germer's electron diffraction experiment, Compton effect, Phase and group velocity, Heisenberg uncertainty principle and its applications, wave function and its significance, Eigen value and Eigen function, Schrödinger wave equations, particle in one dimensional potential box.						8			
II	Lasers: Properties of lasers, the basic process of lasers, Population-inversion, classification of lasers, working of He-Ne, Ruby, Nd: YAG and CO ₂ lasers, Applications of Lasers in Communication, Medical and Industry. Optical fibers: Light guidance through optical fibres, the qualitative idea of critical and acceptance angle, types of fibers, numerical aperture, V-Number, intermodal & material dispersions in fiber. Holography: Basic principle of holography, Construction and reconstruction of Image on hologram and applications of holography.						8			
III	Basic of semiconductors: Density of energy states, Energy-band formations, direct and indirect band gap, Effective mass, Fermi energy						8			

	<p>levels. Mobility and carrier concentrations (intrinsic). Radiative and non-radiative recombination mechanisms in semiconductors .</p> <p>Semiconductor Devices: Properties of PN junction and I-V diode equation, Photovoltaic cell, LED Materials for fabrication, LED Structures and Characteristics; Injection Laser Diode (ILD) - Laser action in semiconductors , structures and efficiency.</p>		
IV	<p>Superconductors: Free electrons theory of metals, Temperature dependence of resistivity in superconducting Metals , 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 superconductors.</p> <p>Nanomaterials: Basic principle of nanoscience and technology, structure, properties ad uses of Fullerene and Carbon nanotubes, Applications of nanotechnology.</p>	8	
V	<p>Dielectrics Materials: Polar and Non-Polar Dielectrics, Dipole moment and Polarization, Dielectric constant& Polarization, Gauss law in Dielectric, the relation between electric field vector E, Pand D.</p> <p>Piezoelectric materials- Ferroelectric materials , Piezoelectric effect, direct and converse parameter definitions, Piezoceramics, Piezopolymers, Piezoelectric materials as sensor and transducers.</p>	8	
Guest Lectures (if any)			
Total Hours		40	
Suggestive list of experiments:			
<ol style="list-style-type: none"> 1. To determine the width of a single slit from the study of Fraunhofer diffraction pattern using a He-Ne Laser. 2. To determine the frequency of A.C. mains using an electrical - vibrator. 3. Determination of Planck's constant. 4. To determine the frequency of A.C. mains using a sonometer. 5. To study the nature of polarization of light using the half-wave plate. 6. To find the numerical aperture of the given fibre. 7. To determine the refractive indices μ_0 and μ_e of Quartz prism for ordinary and extraordinary rays using the spectrometer. 8. To determine the wavelength of monochromatic source of light by Fresnel's biprism. 9. To study the V-I characteristics of semiconductor diode 10. To study V-I Characteristics of LED 11. To study the V-I characteristics of tunnel diode 12. To determine the radius of curvature of a given plano-convex lens by Newton's rings method. 13. To determine the absorption coefficient of a glass plate by "LUMMER- BRODHUM" photometer. 14. To determine the resolving power of a telescope. 15. To determine the wavelength of light emitted by mercury vapour lamp using a diffraction grating. 			
<p>Text Book-</p> <ul style="list-style-type: none"> • Concepts of Modern Physics, Arthur Beiser, Tata McGraw-Hill, 6th edition, 2009. • Optics, A. Ghatak, McGraw Hill, 2012. • Engineering Physics , Hitendra K Malik & A.K. Singh, Mc Graw Hill Education Private Limited • Elements of Modern Physics, S.H. Patil • Kiruthiga Sivaprashta, Modern Physics, S. Chand • A Textbook of Engineering Physics, Gaur and Gupta, Dhanpat Rai Publishers, New Delhi, 8th edition, 2011. • Electrical Engineering Materials by A.J. Dekker, PHI publication 			
<p>Reference Books-</p> <ul style="list-style-type: none"> • Lasers and non-linear optics, B.B. Laud, New Age international, 3rd edition, 2011 			

- Solid State Physics, S.O.Pillai , New Age International Ltd, publishers
- Electromagnetic Theory for Telecommunications, C.S.Liu and V.K.Tripathi, Foundation Books, New Delhi,2007
- Quantum Mechanics by L.I. Schiff, Mc Graw Hill Co.
- A Textbook of Quantum Mechanics by Piravonu Mathews, K. Venkatesan (Tata McGraw Hill)
- Cady, W. G., Piezoelectricity, Dover Publication
- Piezoelectric Materials & Devices: Application in Engineering And Medical Sciences By M.S. Vijiya .CRC Press.
- Electrical Engineering Materials Physics Properties by SP A Seth, Dhanpat Rai Publications.

Modes of Evaluation and Rubric

Assignments, Quiz, Tests & exams

Criteria	Excellent (3 points)	Good (2 points)	Fair(1 point)
Quiz	> 80%	60-80%	40-60%
Test & exam	>75%	60 -75%	< 60%
Assignment	Assignment is coherently organized and the logic / solution to all the problems provided. Writing is clear and concise and persuasive.	Assignment is generally well organized and logic / solution to maximum of the problems provided barring few inaccuracies.	Assignment is poorly organized and difficult to follow. Does not flow logically from one part to another with lots of mistakes

List/Links of e-learning resource

- <https://nptel.ac.in/courses/122107035/#>
- <https://nptel.ac.in/course.html>
- <http://www.tndte.gov.in/site/wp-content/uploads/2016/08/Engineering-physics.pdf>
- <https://physicstoday.scitation.org>
- Barbastathis, G. and Sheppard C., Optics, <https://ocw.mit.edu/courses/mechanical-engineering/2-71-optics-spring-2009/>

Recommendation by Board of studies on

14.06.2022

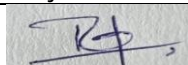
Approval by Academic council on

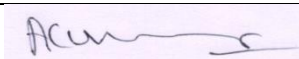
Compiled and designed by

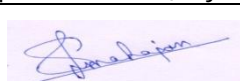
Jetendra Parashar

Subject handled by department


Applied Science (Physics)



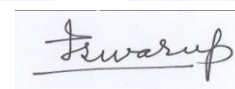














SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

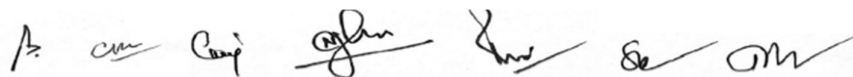
(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Mechanical Engineering

Semester/Year		I/II		Program			B. Tech				
Subject Category	BSC	Subject Code:	MEA102	Subject Name:	Engineering Graphics						
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	Assignment	End Sem	Lab-Work	Quiz					
60	20	10	10	30	10	10	150	03	0	02	04
Prerequisites:											
Basic geometrical construction.											
Course Objective:											
The objective of Engineering Graphics to Enhance imagination and thinking power to create Design of system in any field of engineering, with basic concepts of Engineering Graphics and Design, the students will solve and create models so solve industrial and real-life problems.											
Course Outcomes:											
<ol style="list-style-type: none"> 1. Students should able to understand the various types of Engineering Scales, R.F., Construction of Ellipse and Parabola etc. 2. Learn the fundamentals of points and Straight line and their Importance in Engineering Profession. 3. Understand the Projection of Plane and Solids and their Application 4 Understand the Principal of Development of Surface and Section of Solids 5. Learn about the Isometric Projection and and basic fundamental of CAD/CAM 											
UNITS	Descriptions							Hrs.	CO's		
I	Basic introduction about Drawing, and various instruments required for drawing. Scales: Representative factor, Plain Scales, Diagonal Scales, Scale of Chords Conic Section: Construction of Ellipse, Parabola, hyperbola by different methods; Normal and tangent Special Curves: Cycloid, Epicycloid, Hypocycloid, Involutés, Archimedean, and Logarithmic Spirals							8	1		
II	Projection of points and Straight lines: Projection of Points, concepts of orthogonal projection system. Projection of Lines, Projection of parallel Line, perpendicular line and oblique Line, line placed in two quadrants, line contained by Profile Plane, Traces of lines, methods of determining T.L. and T.I. of oblique line, Rotating line method, Trapezoidal method							8	2		
III	Projection of planes: Projection of perpendicular and oblique plane. Traces of plane. Projection of Solids: Classification of Solids, Position of solids with respect to R.P. projection of platonic solids, polyhedrons, Solids of revolution, projection of solids on Auxiliary plane, Projection of Combination of Solids.							8	3		
IV	Development of Surfaces: Principle of development of surfaces, method of development Parallel line and radial line method for right solid, solids with cutouts, Intersection of cylinders. Section of Solids: Classification of section planes, B.I.S representation, Section of right solids by normal and inclined planes,							8	4		

	Section of platonic solids, True and apparent shape of section.		
V	Isometric projections: Isometric scales, isometric axis, Isometric Projection from orthographic drawing. Computer Aided Drafting (CAD): Introduction, benefits, software's basic command of drafting entities like line, circle, polygon, polyhedron, cylinders, transformations and editing commands like move, rotate, mirror array, solution of projection problems on CAD.	8	5
Guest Lectures (if any)			
Total Hours		40	
Suggestive list of experiments:			
1. Scale 2. Conic Section 3. Engineering Curves 4. Projection of Points 5. Projection of Lines 6. Projection of Planes. 7. Projection of Solids 8. Section of Solids 9. Development of Surfaces 10. Isometric Projection.			
Text Book-			
1. Engineering Drawing by CM Agrawal and Basant Agrawal TMH Publications. 2. A Textbook of Engineering Drawing by R.K. Dhawan			
Reference Books-			
1. N.D. Bhatt and V.M. Panchal, Engineering Drawing Plane and Solid Geometry, Charotar Publishing House. Engineering Drawing and Graphics by K. Venugopal 2. Engineering Graphics by B. Bhattacharyya 3. Technical Drawing with Engineering Graphics by Frederick E Giesecke and Ivan L Hill 4. Engineering Graphics by T. Jeyapooan, S. Gowri			
Modes of Evaluation and Rubric			
There will be continuous evaluation for during the semester for 40 sessional marks and 60 semester End term Marks. The practical marks are 50, out of which 30 marks will be awarded for viva voce and 20 marks for lab work. Out of 40 sessional marks, 20 shall be awarded for Mid semester, 20 marks to be awarded for day to day performance and Quiz/Assignments. For the 60 Marks, there will be a semester – End examination as per the norms of AICTE.			
Recommendation by Board of studies on			
Approval by Academic council on			
Compiled and designed by			
Subject handled by department			





SAMRAT ASHOK TECHNOLOGICAL INSTITUTE

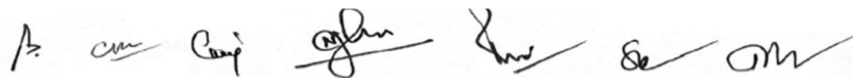
(Engineering College), VIDISHA M.P.

(An Autonomous Institute Affiliated to RGPV Bhopal)

Mechanical Engineering

Semester/Year		II		Program			B.Tech			
Subject Category	ESC	Subject Code:	MEA 101	Subject Name:	Basic Mechanical Engineering					
Maximum Marks Allotted							Contact Hours			Total Credits
Theory				Practical		Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	Assignment	End Sem	Lab-Work					
60	20	10	10	30	20	150	3	0	2	4
Course Objective:										
This Course develop the basic understand about Mechanical Engineering Subjects. At the end of the course students able to know about the basic laws of Thermodynamics and principle of fluid mechanics, Internal Combustion Engine, Material Science and Renewable Sources of Energy										
Course Outcomes:										
At the end of the course, the students will able to:										
CO1: Understand the basic concept of Thermodynamics and working of Boilers and its accessories, evaluate the performance of boiler and properties of Steam.										
CO2: Understand the properties of fluids.										
CO3: Understand the basic Concepts of Internal Combustion Engines and its working.										
CO4: Identify Engineering Materials, and its properties.										
CO5: Understand the basics Metrology, Sin Bar, slip Gauge etc.										
UNITS	Descriptions						Hrs.	CO's		
I	Thermodynamics: Thermodynamic Systems, Properties, Cycles, Process. Zeroth law, First and second law of thermodynamics; steam properties, steam processes at constant pressure, volume, enthalpy & entropy, Refrigeration: Vapour compression cycles, coefficient of performance (COP), refrigerant, properties, and eco-friendly refrigerants.						10	1		
II	Fluids: Fluid properties, pressure, density and viscosity, pressure variation with depth, static and kinetic energy, Bernoulli's equation for incompressible fluids, viscous and turbulent flow, working principle of fluid coupling, pneumatic machines.						8	2		
III	Internal Combustion Engines: Otto and Diesel cycles; working of two stroke & four stroke petrol & diesel IC engines; pv-diagrams of four stroke petrol and diesel engines (Actual & theoretical) Valve timing diagrams, Efficiency: mechanical, thermal, Air standard efficiencies of Otto and Diesel Cycle, Simple Problems.						8	3		
IV	Materials: Classification of engineering material, Composition of cast iron and carbon steels on iron-carbon diagram and their mechanical properties; Alloy steel and their applications; stress-strain diagram, Hooks law and modulus of elasticity, Tensile, shear, hardness and fatigue testing of materials.						6	4		
V	Renewable Energy: New and Renewable sources of Energy such as Solar Energy and its Principle, Solar Collectors, Solar Ponds. Wind Energy, Tidal Energy, and Geothermal Energy. Introduction to electric Vehicles (EVs) and their Principle.						8	5		
Guest Lectures (if any)										

Total Hours	40
Reference Books-	
<ul style="list-style-type: none"> • 1. Nag PK, Tripathi et al.; Basic Mechanical Engineering; TMH • 2. Pravin Kumar; Basic Mechanical Engineering; Pearson • 3. Agrawal B & CM; Basic Mechanical Engineering, Wiley India • 4. Rajput RK; Basic Mechanical Engineering; LP • 5. Nag PK; Engineering Thermodynamics, TMH • 6. Ganeshan; Combustion Engines; TMH • 7. Narula; Material Science, TMH • 8. Sawhney GS; Fundamental of Mechanical Engineering; PHI 	
Modes of Evaluation and Rubric	
<p>There will a continuous evaluation for during the semester for 40 sessional marks and 60 semesters— End examination marks. The practical marks is 50, out of which 30 marks shall be awarded for viva-voce and 20 marks for lab work. Out of 40 sessional marks, 20 shall be awarded for Mid-semester, 20 marks to be awarded for day-to-day performance and Quiz/Assignments.</p> <p>For the 60 marks, there will be a semester – End examination as per norms of AICTE</p>	
List of experiments: (Total 10 Practicals)	
List of Suggested Core Experiments:	
<ol style="list-style-type: none"> 1. Study of Different Boilers and its working with Cut Section Models 2. Study of 4 stroke and 2 Stroke S.I. & C.I. Engine with cut section Models 	
Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	



4. Write a python program to Read a file line by line and print it.
5. Write a program to display the number of lines in the file and size of a file in bytes.
6. Write a program to calculate the factorial of an integer using recursion.
7. Write a program to print Fibonacci series using recursion.
8. Write a program for binary search.
9. Python Program for Sum of squares of first n natural numbers.
10. Python Program to find sum of array.
11. Python program to read character by character from a file.
12. Python Program to print with your own font.
13. Python program to print even length words in a string.
14. Python program to check if a string is palindrome or not.
15. Program to print ASCII Value of a character.
16. Python program to find smallest and largest number in a list.
17. Python program to find the size of a Tuple.

Text Books-

- M. Mano, "Digital Logic and Computer Design", Pearson Education.
- T. L. Floyd, "Digital Fundamentals", Pearson Education.
- A. Anand Kumar, "Fundamentals of Digital Circuits", PHI.

Modes of Evaluation and Rubric

The evaluation modes consist of performance in Two mid-semester Tests, Quiz/ Assignments, term work, end-semester examinations, and end-semester practical examinations.

List/Links of e-learning resource

List and Links of e-learning resources:

4. <https://nptel.ac.in/courses/108/105/108105132/>
5. <https://de-iitr.vlabs.ac.in/>

Recommendation by Board of studies on	June-2022
Approval by Academic council on	June-2022
Compiled and designed by	CS & IT
Subject handled by department	CS & IT

Dr. Kanak Saxena

Dr. Kanak Saxena

Sunil

Dr. Kanak Saxena
Dr. Kanak Saxena
Chairperson



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)

Mechanical Engineering

Semester/Year		II		Program		B.Tech			
Subject Category	ESC	Subject Code:	MEL110	Subject Name:	Workshop Practice				
Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz + Assignment	End Sem	Lab-Work + Quiz					
-	-	-	30	10 +10	50	0	0	2	1
Course Objective:									
This Subjects deals with the Basic Knowledge related to production such as casting, welding, joining etc. After completing this subjects' students are able to analyze the difference between various manufacturing techniques and solve the basic problem related to the subjects									
Course Outcomes:									
At the end of the course, the students will able to:									
1. Learn how to make patterns, Moulding and Design of Pattern									
2. Acquire the Knowledge and application of forging, press working, and to evaluate the power requirements									
3. Understand the Welding Process, Defects in Welding and their remedies.									
4. Learn how to make Various types of Joints such as Lap Joint, Butt Joints etc.									
5. Learn about the Assembling of Engine and its Component in Workshop									
List of Experiments:									
1. To Prepare a T- Half lap joint in carpentry shop.									
2. To Prepare a Dovetail joint in carpentry shop.									
3. To Prepare A Model of Single door window frame in carpentry shop.									
4. To Prepare Chisel from given mild steel rod in black smithy shop.									
5. To Prepare Butt Joint by Electric Arc Welding Process.									
6. To Prepare Lap Joint by Electric Arc Welding Process.									
7. Demonstration of Gas Welding.									
8. To Fabrication of Table frame in welding shop.									
9. To Prepare Sand Mould single piece pattern in Foundry Shop.									
10. To Prepare Sand Mould Two-piece pattern in Foundry Shop.									
11. To Prepare V Joint in Fitting shop.									
12. Assembly of Simple Engine/Machine in Fitting Shop									
Modes of Evaluation and Rubric									
There will a continuous evaluation for during the semester for 20 sessional marks and 30 Marks for End Tem Viva Examination. Out of 20 sessional marks, 10 shall be awarded for Quiz and Assignment, and 10 marks to be awarded for day-to-day performance in Workshop.									
Recommendation by Board of studies on									
Approval by Academic council on									
Compiled and designed by									
Subject handled by department									



SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Humanities and Management

Semester/Year		II Year	Program				B.Tech All Branches				
Subject Category	MAC	Subject Code:	MAC102	Subject Name:	Professional Ethics and Social Responsibility						
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks	L	T	P	
End Sem	Mid-Sem	Quiz	Assignment	End Sem	Lab-Work	Quiz					
00	00	00	00	30	10	10	50	0	0	2	Grade
Prerequisites:											
To enable the students to instill moral, to create an awareness of professional ethics, human values, loyalty and social responsibility.											
Course Objective:											
At the end of the course, the students will be able to:											
<ol style="list-style-type: none"> 1. To learn the importance of values and ethics in personal life and professional careers. 2. To gain knowledge of ethical behavior. 3. To acquire the basics of social responsibility. 											
Course Outcomes:											
<ol style="list-style-type: none"> 1. To imbibe and internalize the basic purpose of human values. 2. To appreciate professional rules and codes of conduct in personal life and professional careers. 3. To know the importance of values and ethics in professional behavior. 4. To impart norms of professional ethics in life through rationality, consistency and impartiality. 5. To inculcate the sense of social responsibility. 											
UNITs	Descriptions							Hrs.	CO's		
I	Principles of professional ethics: honesty, trustworthiness, loyalty, being law-abiding, no sinister motives, socially responsible, respect, accountability and fairness to all							8	1		
II	Codes of conduct: public, clients, professional community, profession, workplace rights and responsibilities, other stakeholders.							6	2		
III	Factors necessitating professional ethics: advisory responsibilities, contractual duties; The importance of ethical behavior in business.							4	3		
IV	Personal ethics: impartiality, rationality, consistency and reversibility Norms of professional ethics in our life.							8	4		
V	Corporate social responsibility: environmental, philanthropic, ethical,							9	5		

	and economic responsibility.		
Guest Lectures (if any)		2	
Total Hours		40	
Suggestive list of experiments:			
1. N.A			
1. Text Book- Professional ethics includes Human values, R. Subramanian, Oxford higher education.			
Reference Books-			
2. Professional Ethics and Social Responsibility, Daniel E. Wueste, Rowman and Littlefield Publication, INC			
3. Professional ethics and human values, R. S. Naagarazan, New age international (P) limited ,New Delhi,2006.			
4. Human values and professional ethics,Jayshree Suresh, B. S. Raghvan,S. Chand			
5. http://www.slideword.org/slidestag.aspx/human-values-and-Professional-ethics .			
Modes of Evaluation and Rubric			
Questionnaire,Quiz,Presentation and standard procedure will be followed .			
List/Links of e-learning resource			
<ul style="list-style-type: none"> • https://onlinecourses.nptel.ac.in • https://www.classcentral.com (swayam) 			
Recommendation by Board of studies on	26/02/2022		
Approval by Academic council on			
Compiled and designed by	Dr. Manorama Saini and Dr. VeenaDatar		
Subject handled by department	Humanities and Management		

H. S.
15/06/2022

S. S.

S. S.

S. S.