Jaypee Institute of Information Technology

B.Tech. Biotechnology

Semester II

Course Descriptions

Detailed Syllabus

Lab-wise Breakup

Course Code	**18B15BT111**	**Semester** Even semester **(specify Odd/Even)**	**Semester II Session** 2018 -2019 **Month from** January to June
Course Name	Basic Bioscience Lab		
Credits	**1**	**Contact Hours**	**2 hours**

Faculty (Names)	**Coordinator(s)**	**Ekta Bhatt**
	Teacher(s) (Alphabetically)	Dr. Indira P. Sarethy Dr. Priyadarshini Ms. Ekta Bhatt

COURSE OUTCOMES		**COGNITIVE LEVELS**
C177.1	Demonstrate good laboratory practices and documentation.	Understand Level (C2)
C177.2	Show working of equipments& instruments.	Understand Level (C2)
C177.3	Apply knowledge of essential concepts related to biomolecules.	Apply Level(C3)
C177.4	Analyze experimental data and drawing valid conclusion.	Analyze Level(C4)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	**Laboratory safety guidelines**	**Good and bad laboratory practices. Safety handling of instruments,equipments and documentation.**	Understand Level (C2)
2.	**Concept of ph and pKa**	**Basic principle of ph and pka. Preparation of stock buffers**	Apply Level (C3)
3.	**Essential concept of biomolecules**	**Qualitative and quantitative estimation of Carbohydrates and Proteins.**	Apply Level (C3)
4.	**Analyze experimental data**	**Analyze experimental data and drawing valid conclusion.**	Analyze Level (C4)
		Total No. of Labs-12	
Evaluation Criteria Evaluation Criteria			

Components	**Maximum Marks**
Mid-Semester lab-viva/ test	20
End-Semester lab-viva/ test	20
Day to Day performance (Learning laboratory Skills and handling Laboratory Equipments, attendance)	45
Laboratory record	15
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Introductory practical book of Biochemistry by S.K.Sawhney, Randhirsingh (Narosa Publishing House)
2.	Rex M. Heyworth, Procedural and conceptual knowledge of expert and novice students for the solving of a basic problem in chemistry, *International Journal of Science Education*, **21**, 2, (195), (1999).
3.	Boyer R.F. *Modern Experimental Biochemistry.* Massachusetts: Addison-Wesley Publishing Co., 1986
4.	Strong, F. C. (1952) Theoretical basis of the Bouguer-Beer law of radia-tion absorption. Anal. Chem. 24, 338–342
5.	Ninfa, A. J., Ballou, D. P., and Parsons, M. B. (2010) Fundamental Labo-ratory Approaches for Biochemistry and Biotechnology, Alexander J.Ninfa, David P. Ballou, Marilee Benore, Eds., Wiley, Hoboken, NJ

Detailed Syllabus

Course Code	18B11CI121	**Semester Even**	**Semester II Session 2018- 2019** **Month from** January to June
Course Name	Fundamental of Computer Programming II		
Credits	**4**	**Contact Hours**	**3L+1T**

Faculty (Names)	**Coordinator(s)**	Mradula Sharma
	Teacher(s) (Alphabetically)	Mradula Sharma

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Define basics of C programming language like its data types, operators, control flow and loop control.	Remember (C3)
CO2	Develop C programs using Controls flows like while, do while, for loops, if else , switch case, etc.	Apply (C3)
CO3	Experiment with single and multi dimensional arrays, structure and functions in C programming Language.	Apply (C3)
CO4	Explain basic features of object-oriented design such as encapsulation, polymorphism, inheritance, and abstraction and compare it with function oriented programming.	Understand(C2)
CO5	Develop a simple web application with client and server side scripting using JavaScript and PHP and connect with a given relational database	Apply (C3)

Module No.	Subtitle of the Module	Topics in the module	Number of lectures for the module
1	C Programming	Syntax and semantics, data types and variables, expressions and assignments, array and struct, simple I/O, conditional and iterative control structures Programs on unit conversion, approximating the square root of a number, finding the greatest common divisor, average, sum, min, max of a list of numbers, common operations on vector, matrix, polynomial, strings, programs for pattern generation.	16
2	Functions in C Programming	Functions and parameter passing (numbers, ,characters, array, structure) , recursion, e.g. factorial, Fibonacci, Scope of variable	10
3	functions oriented programming Vs object oriented programming	comparison between FOP and OOP , OOPs Concepts	7
4	HTML forms, Introduction to client and servers side scripting, introduction to PHP	HTML forms, creating dynamic web pages with database connectivity using Mysql	9
		Total Number of lectures	42

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25(Attendance :10, Assignment :10, quiz:5)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1	H. Cooper and H. Mullish, Jaico Publishing House. “Spirit of C”, 4th Edition, Jaico Publishing House,2006
2	Herbert Schildt. “The Complete Reference C ”, 4th Edition, TMH, 2000
3	Brian W. Kernighan and Dennis M. Ritchie ,“The C Programming Language”, 2nd Edition, Prentice-Hall India, New Delhi, 2002
4	User manuals supplied by department for C , PHP, html and sql

Detailed Syllabus

Course Code	**18B15CI121**	**Semester Even**	**Semester II Session 2018- 2019** **Month from** January to June
Course Name	Computer Programming lab II		
Credits	**1**	**Contact Hours**	**2**

Faculty (Names)	**Coordinator(s)**	Mradula Sharma
	Teacher(s) (Alphabetically)	Mradula Sharma

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Demonstrate basic programs of different data types and operators in C.	Understand (C2)
CO2	Develop C programs using Controls flows like while, do while, for loops, if else , switch case, etc.	Apply (C3)
CO3	Make use of single and multi dimensional arrays, structure and functions in C programming language.	Apply (C3)
CO4	Demonstrate basic features of object-oriented programming such as objects and classes in C++.	Understand (C2)
CO5	Develop a simple web application with client and server side scripting using Javascript and PHP and connect with a given relational database	Apply (C3)

Module No.	**Title of the Modula**	**List of Experiments**	**CO**
1.	Basic Programming In C	Data types, Declaring Variables, Initializing Variables, Type Conversion	CO1
2.	Operators and Expressions And Input Output In C	Conditional operators, Arithmetic, Relational, Assignment, Logical and Bitwise operators, Formatted Functions, Flags, Widths and Precision with Format String, Unformatted Functions	CO1

3	Decision Statements	If statement, IF- else, If-else-if, break, continue, go to, switch case	CO2
4	Loop Control	The for loops , nested for loop, the while loop, do while loop	CO2
5	Data Structure: Array and structure	Array, 2 D array, Matrix operations, structure and functions	CO3
6	C++ programming	Programs based on class and objects	CO4
7	PHP, Java Script and HTML Forms	Develop a simple web application with client and server side scripting using Javascript and PHP and connect with a given relational database	CO5

Evaluation Criteria

Components	**Maximum Marks**
Evaluation 1	15
Evaluation 2	15
Evaluation 3	15
Lab Test 1	20
Lab Test 2	20
TA	15

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1	H. Cooper and H. Mullish, Jaico Publishing House. “Spirit of C”, 4th Edition, Jaico Publishing House,2006
2	Herbert Schildt. “The Complete Reference C ”, 4th Edition, TMH, 2000
3	Brian W. Kernighan and Dennis M. Ritchie ,“The C Programming Language”, 2nd Edition, Prentice-Hall India, New Delhi, 2002
4	User manuals supplied by department for C , PHP, html and sql

Detailed Syllabus

Lecture-wise Breakup

Course Code	15B11MA212	**Semester Even (specify Odd/Even)**	**Semester** II **Session** 2018 -2019 **Month from** January to June
Course Name	BASIC MATHEMATICS 2		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Dr. SheetalDeshwal	
	Teacher(s) (Alphabetically)	Dr. SheetalDeshwal	

COURSE OUTCOMES		**COGNITIVE LEVELS**
C108.1	Explain different tests for the convergence of sequence and series.	Understanding Level(C2)
C108.2	Explain the basic concept of vectors and coordinate geometry.	Understanding Level(C2)
C108.3	Apply differentiation and integration in vector & scalar valued functions.	Understanding Level(C2)
C108.4	Classify and solve the ordinary differential equations with constant coefficients.	Applying level(C3)
C108.5	Explain the measures of central tendency and apply the method of least squares for curve fitting.	Applying Level(C3)
C108.6	Apply basic numerical methods for finding roots, differentiation and integration.	Applying Level(C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Series and Sequence	Limits of sequence, ratio test for sequence of real numbers, comparison test for series of real numbers, absolute convergent and conditional convergent.	04
2.	Fourier Series	Concept of Fourier series of periodic functions, half range series, Fourier series for odd and even function.	05
3.	Vector Algebra	Introduction of vectors , unit vectors, normal vectors, dot and cross product of vectors. Projection of vectors on another, direction ratios and direction cosines.	06
4.	Coordinate Geometry	Distance between two points, equation of a line , plane, sphere. Shortest distance between two lines.	05
5.	Calculus of two or more variables	Partial differentiation, Taylor's series for two variables, tangent to curve, double integral, change of order of integration.	05
6.	Introduction of ordinary differential equations	Definition of order and degree of differential equations. Concept of linear and non linear ordinary differential equation. Solution of first order linear ordinary differential equations.	03
7.	Higher order differential equations	Linear differential equations with constant coefficients, complementary function and particular integral. Solution in power series of differential equations.	04
8	Basic Statistics	Classification of data, Mean, median, mode and curve fitting.	05

9.	Numerical analysis	Newton-Raphson method, linear and quadratic interpolation. Numerical integration by Simpson's rule. Solution of ordinary differential equation by Runge-Kutta method.	05
Total number of Lectures			**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorials.)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	**Thomas, G. B. & Finney, R. L.,** Calculus and analytical geometry, 9th Ed., Pearson Education Asia (Adisson Wesley), New Delhi, 2000.
2.	**NCERT.** Mathematics Textbook for class XI and XII, 2009.
3.	**Sharma, R.D.,** Mathematics, Dhanpat Rai Publications, New Delhi, 2011.
4.	**Kreyszig, E.**, Advanced Engineering Mathematics, 8th Ed., John Wiley, 2002.

Detailed Syllabus

Lecture-wise Breakup

Course Code	15B11PH212	**Semester Even**	**Semester** II **Session** 2018 -2019 **Month from** January to June
Course Name	BIO-PHYSICAL TECHNIQUES		
Credits	4	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Prof. S. P. Purohit
	Teacher(s) (Alphabetically)	S. P. Purohit

COURSE OUTCOMES		**COGNITIVE LEVELS**
C104.1	Select biophysical spectroscopic technique(s) for their application(s) in determining structural details and properties of molecules.	Remembering (C1)
C104.2	Explainunderlying principles of different biophysical techniques at atomic and molecular level and working principles of related spectrometers/microscopes.	Understanding (C2)
C104.3	Apply different biophysical techniques and choose appropriate technique(s) for investigating structural details and properties of a molecular sample.	Applying (C3)
C104.4	Analyse spectroscopic/microscopic data obtained from different biophysical techniques.	Analyzing (C4)
C104.5	Evaluate numerical values of different physical parameters involved in the modelling of different biophysical techniques at atomic and molecular level.	Evaluating (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Principles and Applications	Biophysical techniques and their applications, Quantization of energy levels in atoms and molecules, Concept of matter waves, uncertainty principle and Schrödinger wave equation, Rigid rotor, non- rigid rotor, Harmonic Oscillator, and anharmonic oscillator, Regions of the electromagnetic spectrum, Types of spectra – absorbance, Beer-Lambert's law, emission, and fluorescence Width and intensity of spectral lines, Optically allowed and forbidden transitions.	8
2.	Microwave Spectroscopy	Microwave active molecules, Rotation of molecules, Rotational spectra of di-atomic molecules, Rigid rotor and non rigid rotor, Microwave spectroscopy technique, Example of molecular microwave spectra.	3

3.	Infrared Spectroscopy	IR active molecules, Vibration spectra of diatomic molecules, Vibration rotation spectra of diatomic molecules, FTIR, Example of molecular IR spectra.	3
4.	Raman Spectroscopy	Raman effect, Molecular polarizability, Rotational and vibrational Raman Spectra, Raman spectrometry technique, example of molecular Raman spectra.	3
5.	UV Visible Spectroscopy	UV Visible spectroscopy of molecules, Electronic transitions in molecules, Frank-Condon principle, Dissociation energy, UV Visible spectroscopic technique, Example of molecular UV- Visible spectra.	3
6.	Mass Spectrometry	Working principle of mass spectrometer, Mass spectrum and the base peak, Nitrogen rule, Identifying compounds and isotopes, Determination of molecular formula, Mass spectrometer, Example of molecular mass spectra.	4
7.	NM R	Interaction between spin and magnetic field, Nuclear Magnetic Resonance (NMR), PMR and C NMR, Chemical shift, NMR technique and applications, Example of molecular NMR spectra.	5
8.	Crystallography	Bonding in solids, Types of crystals, Miller Indices, Reciprocal lattice, X-ray diffraction, Bragg's law and its application, Energy dispersive X-ray spectroscopy (EDX) Example of X-ray diffraction from molecular structure.	5
9.	Electron Microscopy	Electron Microscopy – basic principle, Scanning Electron Microscope (SEM), Example of some SEM images. Transmission Electron Microscope (TEM), Example of some TEM images, Scanning Probe Microscopy (STM and AFM)	6
		Total number of Lectures	**40**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 [2 Quiz (10 M), Attendance (10 M) and Cass performance (5 M)]
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	**Text 1:** Fundamentals of Molecular Spectroscopy, C. N. Banwell and E. M. McCash,Tata McGraw-Hill, 4rd Edition 1995.
2.	**Text 2:** Crystallography applied to Solid State Physics, A R Verma, O N Srivastava, New Age International Publishers

3.	**Text 3:** Electron Microscopy and Analysis, P. J. Goodhew, J. Humphreys, R Beanland, 3rd Edition, 2000.
4.	**Reference 1.**Conformation of Biological Molecules.Govil G. and Hosur R.V. (1982), Springer Verlag, Berlin, Heidelberg, New York.
5.	**Reference 2.**Practical Biochemistry, K. Wilson and J. Walker, Cambrige Press, 5th edition.

Detailed Syllabus

Lecture-wise Breakup

Course Code	**15B11EC111**	**Semester - Even**	**Semester** II **Session** 2018 -2019 **Month from** JanuarytoJune
Course Name	**Electrical Science -1**		
Credits	**4**	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Ms Monika (JIIT – 62), Dr Ashish Gupta (JIIT – 128)
	Teacher(s) **(Alphabetically)**	Dr Ankit Garg, MrAtul Kumar Srivastava, Mr Gopal Rawat, Dr Kaushal Nigam, DrNeetu Joshi, DrRachna Singh, DrReema Budhiraja, MrRitesh Sharma, DrSajaivir Singh, DrShrutiKalra, Dr Vijay Khare, DrVimal Kr. Mishra

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Recall the concepts of voltage, current, power and energy for different circuit elements.	Remembering (Level I)
CO2	Apply the Kirchhoff laws to identify the node voltages and branch currents, apply different network theorems in the complex networks.	Applying (Level III)
CO3	Demonstrate the physical model for given Sinusoidal AC signal and construct the phasor diagrams.	Applying (Level III)
CO4	Explain V-I characteristics of Diodes and Illustrate the construction and operation of Bipolar Junction Transistor (BJT) for different configurations.	Analyzing (Level IV)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for**

			the module
1.	Basic Concepts	Voltage, Current, Power and Energy analysis for Circuit elements (R, L, C), Independent and Dependent Sources, Kirchhoff's Laws, Voltage Divider rule, Current Divider rule, Star-Delta Transformation, Source transformation,	6
2.	DC Circuit Analysis	Mesh and Supermesh Analysis, Nodal and super nodal Analysis,	4
3.	Network Theorems	Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem	6
4.	Sinusoidal Steady State Analysis	Physical Model for a Sinusoid, Average Value, Effective Value, Phasor presentation, Addition of Phasor using Complex Numbers, Concepts of impedance and admittance. Network Analysis and Theorems: Mesh and Nodal analysis, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem	8
5.	Diodes & Applications	PN Junction, Biasing the PN Junction, Current–Voltage Characteristics of a PN Junction, PN Junction Diodes, Half Wave Rectifier & Full Wave Rectifier, Clipper & Clamping Circuits, Zener Diodes and applications, Line and load regulations	8
6.	Bipolar Junction Transistor	Transistor Construction and Basic Transistor Operation, Transistor Characteristics (CE, CB, CC), Transistor Biasing	11

		& Stability, Small Signal BJT Amplifier (using h-parameter model)	
		Total number of Lectures	**43**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment = 12, Quiz = 5, Attendance = 8)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books,Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1. R.C. Dorf and James A. Svoboda, "Introduction to Electric Circuits**",** sixth edition, John Wiley & Sons.

2. Robert L. Boylestad, Louis Nashelsky, " Electronic Devices and Circuit Theory ", 7th Edition, Prentice Hall of India.

Detailed Syllabus

Lab-wise Breakup

Course Code	**15B17EC171**	**Semester** Even **(specify Odd/Even)**	**Semester** II **Session** 2018 -2019 **Month from** January to June
Course Name	Electrical Science Lab-1		
Credits	**1**	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Ritesh Kr Sharma (sec-62), Vimal Kumar Mishra (sec-128)
	Teacher(s) (Alphabetically)	Jitendra Mohan, Ankit Garg, Ankur Bhardwaj, Atul Kumar Srivastava, Jasmine Saini, Neetu Joshi, Ritesh Kumar Sharma, Shamim Akhter ShradhaSaxena, shrutikalra, VikramKarwal, Vishal NarainSaxena, Vijay Khare

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Show the working of different electronic apparatus and to identify the electronic components.	C1
CO2	Demonstrate the electrical circuits using Kirchhoff's law	C2
CO3	To acquire the knowledge of network theorems for analysis of electrical circuits	C3
CO4	Explain the characteristics of PN junction, Zener diode and analyze the behavior of full/half wave rectifier, clippers, clampers and voltage regulator circuits.	C4
CO5	Explain and analyze the input and output characteristics of BJT.	C4

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Introduction of active and passive	Introduction to various components (Resistor, Capacitor, inductor, diode, Transistor and IC) and instruments (CRO,	1

	components	Multimeter, Bread board, Regulated D.C. power supply).	
2.	Analysis and verifications of Kirchoff's Laws	Verification of KVL and KCL using a given circuit	2
3.	Analysis and verification of Superposition Theorem	Verification of Superposition Theorem for a given circuit	3
4.	Analysis and verification of Thevenin's Theorem	Verification of Thevenin'sTheorem for a given circuit	3
5.	Analysis and verification of Maximum Power Transfer Theorem	Verification of Maximum Power Transfer Theorem	3
6.	Study of P-N Junction diode	To observe the V-I characteristics of a P-N junction diode in forward bias. Also determine forward resistance of the diode	4
7.	Study and analysis of Rectifier	To observe the output waveform of full wave rectifier and calculate it's ripple factor and efficiency	4
8.	Wave-shaping using Clipper and Clamper circuits	Realization of desired wave shapes using clipper and clamper circuits.	4
9.	Study and analysis of Zener diode	To study forward and reverse bias volt-ampere characteristics of a Zener diode. Also determine the breakdown voltage, static and dynamic resistance	4
10.	Analysis of Zener regulator for line regulation	To study Zener voltage regulator and calculate percentage regulation for line regulation	4
11.	Analysis of Zener regulator for load regulation	To study Zener voltage regulator and calculate percentage regulation for load regulation	4
12.	Study and analysis of input characteristics of	To plot input characteristics of BJT for Common Emitter Configuration	5

	CE amplifier		
13.	Study and analysis of output characteristics of CE amplifier	To plot output characteristics of BJT for Common Emitter Configuration	5
14.	Study and analysis of input characteristics of CB amplifier	To plot input characteristics of BJT for Common Base Configuration	5
15.	Study and analysis of output characteristics of CB amplifier	To plot output characteristics of BJT for Common Base Configuration	5

Evaluation Criteria

Components	**Maximum Marks**
Mid Sem. Viva	20
End Sem. Viva	20
Day to Day Work	60
Total	**100**

Recommended Reading Material:

1.	Boylestad, R.L., Nashelsky, L. and Li, L., 2002. *Electronic devices and circuit theory* (Vol. 11). Englewood Cliffs, NJ: Prentice Hall.
2.	Dorf, R.C. and Svoboda, J.A., 2010. *Introduction to electric circuits*. John Wiley & Sons.

Detailed Syllabus

Lab-wise Breakup

Course Code	18B15GE111	**Semester** Even **(specify Odd/Even)**	**Semester** II[nd] **Session** 2018 -2019 **Month from** January
Course Name	Engineering Drawing and Design		
Credits	1.5	**Contact Hours**	3Hrs

Faculty (Names)	**Coordinator(s)**	Rahul Kumar
	Teacher(s) (Alphabetically)	Deepak Kumar, Rahul Kumar

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Recall the use of different instruments used in Engineering Drawing and Importance of BIS and ISO codes.	Remembering (Level I)
CO2	Illustrate various types of mathematical curves and scale.	Understanding (Level II)
CO3	Classify different types of projection and Construct Orthographic projection of Point, Line, Plane and Solid.	Applying (Level III)
CO4	Construct Isometric Projection and Conversion of Orthographic view to Isometric view and vice-versa.	Applying (Level III)
CO5	Construct Engineering model in Drawing software(AutoCAD) and Compare it with conventional drawing.	Analyzing (Level IV)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Introduction to Engineering Drawing	• Principles of Engineering Drawing and their significance, Usage of Drawing Instruments • Single stroke Vertical and Inclined Gothic	CO1

		Lettering	
2.	Conic Sections	• Conic sections and Special Curves	CO2
3.	Orthographic Projections	• Projection of Point • Projection of Line • Projection of Plane	CO3
4.	Projections of Regular Solids	• Projection of Solid having axis perpendicular to Principal Plane • Projection of Solid having axis inclined to Principal Plane	CO3
5.	Sections and Sectional Views of Right Angular Solids	• Section of Polyhedron Parallel to Principal plane • Section of Polyhedron inclined to Principal plane	CO3
6.	Isometric Projections	• Isometric View of Solids	CO4
7.	Overview of Computer Graphics	• Demonstrating knowledge of theory of CAD software	CO5
8.	Annotations, layering & other functions	• Draw a Solid structure using Layer command	CO5

Evaluation Criteria

	Components	**Maximum Marks**
I.	TA (Attendance + D2D)	60 (10+50)
II.	Mid Sem Exam	20
III.	End Sem Exam	20
	Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	N.D. Bhatt, V.M. Panchal & P.R. Ingle, Engineering Drawing, Charotar Publishing House
2.	B. Agrawal & C.M. Agrawal, Engineering Graphics, TMH Publication
3.	K.L. Narayana & P. Kannaiah, Text book on Engineering Drawing, Scitech Publishers
4.	M.B. Shah & B.C. Rana, Engineering Drawing and Computer Graphics, Pearson Education