Jaypee Institute of Information Technology

B.Tech. Biotechnology

Semester II

Course Descriptions

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11EC111	**Semester** Even **(specify Odd/Even)**	**Semester: II Session** 2019 -2020 **Month from:**January to June
Course Name	**Electrical Science -1**		
Credits	4	**Contact Hours**	3+1

Faculty (Names)	**Coordinator(s)**	Ashish Gupta, Madhu Jain
	Teacher(s) (Alphabetically)	Atul Srivastava, MandeepNarula, Neetu Joshi, Nisha, Rachna Singh, Shraddha Saxena

COURSE OUTCOMES		**COGNITIVE LEVELS**
C113.1	Recall the concepts of voltage, current, power and energy for different circuit elements. Apply the Kirchhoff laws and different analyzing techniques to identify the different circuit parameters.	Apply Level (C3)
C113.2	Define and apply the networks theorems in the complex AC and DC circuits, networks. Demonstrate the physical model for given Sinusoidal AC signal and construct the phasor diagrams.	Applying Level (C3)
C113.3	Demonstrate the conept of resonance and operate different instrumental and measurement equipments.	Understanding Level (C2)
C113.4	Demonstrate the construction and working of single phase transformer.	Understanding Level (C2)

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	6
2.	DC Circuit Analysis	Star-Delta Transformation, Source transformation, Mesh and Supermesh Analysis, Nodal and super nodal Analysis	6
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.	4
5.	AC Network Analysis and Theorems	Mesh and Nodal analysis, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem	6
6.	Resonant Circuits	Series and Parallel resonance, frequency response of Series	4

		and Parallel resonance, Q-Factor, Bandwidth	
7.	Electrical Instruments	Essentials of an Instrument, Permanent Magnet Moving Coil (PMMC) Instruments, voltmeter, ammeter, Ohmmeter, Meter Sensitivity (Ohms-Per-Volt Rating); Loading Effect; Multimeter; Cathode Ray Oscilloscope: Construction, Working and Applications. Function Generators	6
8.	Single Phase Transformer	Principle of operation, construction, e.m.f. equation, equivalent circuit, power losses, efficiency (simple numerical problems), introduction to auto transformer.	4
		Total number of Lectures	**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment = 10, Quiz = 5, Attendance = 10)
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"**,** 9th ed, John Wiley & Sons, 2013.
2.	Charles K. Alexander (Author), Matthew N.O Sadiku, " Fundamentals of Electric Circuits", 6th ed, Tata Mc Graw Hill, 2019.
3.	Robert L. Boylestad, Louis Nashelsky, " Electronic Devices and Circuit Theory ", 11th ed, Prentice Hall of India, 2014.
4.	D.C. Kulshreshtha, Basic Electrical Engineering,Revised 1st ed, Tata Mc Graw Hill, 2017 .

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11PH212	**Semester Even**	**Semester:**II **Session** 2019-2020 **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
Lab-wise Breakup

Course Code	15B17EC171	**Semester** Even (specify Odd/Even)	**Semester:**II **Session** 2019 -2020 **Month from:**January to June
Course Name	Electrical Science-1 Lab		
Credits	2	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Kaushal Nigam & Nisha Venkatesh
	Teacher(s)	Abhay Kumar, Ashish Gupta, Atul K. Srivastava, Amit Kumar Goyal, Ankit Garg, Jyoti Vyas, Kirminder Singh, Monika, Madhu Jain, Ritesh Sharma, Raghvendra Singh, SajaiVir Singh, Varun Goel, Vijay Khare.

COURSE OUTCOMES		**COGNITIVE LEVELS**
C176.1	Understand various active and passive components and instruments (Multimeter, Bread board, Regulated D.C. power supply).	Understanding (C2)
C176.2	Acquire the knowledge of electrical network and circuit such as branch, node, loop and mesh in networks and circuits.	Analyzing (C4)
C176.3	Study and verification of reduction technique using different network theorem.	Remembering (C1)
C176.4	Study and verification of series and parallel AC circuits as well as Open & Short Circuit Test in single phase transformer.	Applying (C3)

Module No.	**Title of the Module**	**List of Experiments**	**COs**
1.	Introduction of active and passive components	Introduction to various components (Resistor, Capacitor, inductor, and IC) and instruments Multimeter, Bread board, Regulated D.C. power supply and CRO.	C176.1
2.	Analysis and verifications of Mesh and Node	Verification of KVL and KCL using a given circuit.	C176.2
3.	Analysis and verification of Transform	Realization of Equivalent Resistance of Star to Delta and Delta to Star Transformation.	C176.2

	Network		
4.	Analysis and verification of of Super Node	Verification of Super Node using Voltage Source.	C176.2
5.	Analysis and verification of Divider rules for Current and Voltage	To verify the voltage divider rule (VDR) and the current divider rule (CDR).	C176.2
6.	Study and Analysis of Superposition Theorem	Verification of Superposition Theorem.	C176.3
7.	Analysis and verification of Thevenin's/ Norton Theorem	Verification of Thevenin'sTheorm and Norton Theorm.	C176.3
8.	Analysis and verification of Maximum Power Transfer Theorem	Verification of Maximum Power Transfer Theorem.	C176.3
9.	Study and Verification of AC Signal in term of RMS and PP Value	To study the Root-Mean-Square(RMS), Peak, and Peak-to-Peak Values, Measurements with Oscilloscope.	C176.4
10.	Study and Analysis of Resonance Circuit	To study the behavior of Series-Parallel RLC Circuit at Resonance.	C176.4
11.	Study of open Circuit Test	Open Circuit Test in Single Phase Transformer using Vlab.	C176.4
12.	Study of Short Circuit test	Short Circuit Test in Single Phase Transformer using Vlab.	C176.4

Evaluation Criteria

Components	**Maximum Marks**
Viva1	20
Viva2	20

Report file, Attendance, and D2D (15+15+30)	60
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.	Nilsson Riedel, Electric Circuits," Pearson, 11th Edition, 2019
2.	Abhijit Chakrabarti, "Circuit Theory Analysis and Synthesis," Dhanpat Rai & Co.; 7th Edition , 2018
3.	U. S. Bkashi A.U. Bakshi S. Ilaiyaraja,, "Circuit Theory Technical Publications; 3rd Edition, 2019
4.	Roman Malaric, "Instrumention and Measurement in Electrical Engineering, "Universal Publisher, 3rd Edition, 2011.
5.	DP Kothar and I J Nagrath, " Electric Machine," TMH; 4 th Edition, 2010

Detailed Syllabus
Lecture-wise Breakup

Course Code	18B11CI121	**Semester Even**	**Semester** II **Session** 2019- 2020 **Month from** January to June
Course Name	Fundamental of Computer Programming II		
Credits	**4**	**Contact Hours**	**3L+1T**
Faculty (Names)	**Coordinator(s)**	Somya Jain	
	Teacher(s) (Alphabetically)	Somya Jain	

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 = 07, Class Test, Quizzes, etc = 07, Internal Assessment = 05, Assignments in PBL mode = 06)
Total	**100**

Text Reading material:

1	Deitel, Paul; Deitel, Harvey, C: How to Program (8 Edition.). Pearson. ISBN 978-0133976892, 2015.
2	Perry, Greg; Miller, Dean, C Programming: Absolute Beginner's Guide (3 ed.). Que. ISBN 978-0789751980, 2013.
3	C Programming: The Definitive Beginner's Reference, Harry H. Chaudhary, First MIT-Createspace-Inc, 2014.
4	Programming in ANSI C, E Balagurusamy, 8th Edition, Mc Graw Hill 2019,
5	Stroustrup, Bjarne, The C++ Programming Language (Fourth ed.). Addison-Wesley. ISBN 978-0-321-56384-2, 2013.
6	Nixon, Robin. Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5. " O'Reilly Media, Inc.", 2014.
7	David Griffiths, and Dawn Griffiths “Head First C 1/e Edition”, O’Reilly Publication, 2012.
8	D. S. Malik, “C++ Programming: From Problem Analysis to Program Design, 6th Edition, Course Technology, Cengage Learning, 2012
Recommended Reading material: (Reference Books)	
1	B W. Kernighan and Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, Prentice-HallIndia, New Delhi, 2002.
2	H. Schildt, **“**C: The Complete Reference”, Tata McGraw-Hill Education, 4th Edition, TMH 2000.
3	Y. Kanethkar, “Let Us C”, BPB Publication, 16th Edition, 2018.

Detailed Syllabus
Lab-wise Breakup

Course Code	**18B15BT111**	**Semester** Even **(specify Odd/Even)**	**Semester:**II **Session** 2019 -2020 **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	**18B15CI121**	**Semester** Even **(specify Odd/Even)**	**Semester** II **Session** 2019 -2020 **Month from** January to June
Course Name	Computer Programming lab II		
Credits	1	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Kirti Aggarwal
	Teacher(s) (Alphabetically)	Kirti Aggarwal, PurteeKohli, Somya Jain

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 Module**	**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
Lab Test 1	20
Evaluation 2	15
Lab Test 2	20
Lab Records	15
Attendance	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.	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
Lab-wise Breakup

Course Code	18B15GE111	**Semester**Even **(specify Odd/Even)**	**Semester:** II **Session** 2019-2020 **Month from**January to June
Course Name	Engineering Drawing and Design		
Credits	1.5	**Contact Hours**	3

Faculty (Names)	**Coordinator(s)**	MadhuJhariya,Deepak Kumar
	Teacher(s) (Alphabetically)	Chandan Kumar, Nitesh Kumar, Rahul Kumar,Vimal Saini

COURSE OUTCOMES		**COGNITIVE LEVELS**
C178.1	Recall the use of different instruments used in Engineering Drawing and Importance of BIS and ISO codes.	Remembering (Level I)
C178.2	Illustrate various types of mathematical curves and scale.	Understanding (Level II)
C178.3	Classify different types of projection and Construct Orthographic projection of Point, Line, Plane and Solid.	Applying (Level III)
C178.4	Construct Isometric Projection and Conversion of Orthographic view to Isometric view and vice-versa.	Applying (Level III)
C178.5	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 graphics and their significance, usage of drawing instruments. • Technical vertical capital letters which includes English alphabets and numeric.	C178.1
2.	Engineering Curves	• Constructing a pentagon and hexagon; engineering curves: Parabola, Ellipse, Hyperbola, Cycloids and Involutes.	C178.2
3.	Orthographic Projections	• **Projection of points:** Point on VP, HP, in space. • **Projection of straight lines:** Lines inclined or parallel to any one of the planes; lines inclined to both HP and VP with traces. • **Projection of planes:** Plane on VP, HP, inclined to any one of the planes; plane inclined to both HP and VP.	C178.3
4.	Projections of	• Projections of solids in simple position, inclined to	C178.3

	Regular Solids	one/both the planes.	
5.	Sections and Sectional Views of Right Angular Solids	• **Sections of solids:** Section of standard solids and true shape section of standard machine elements for the section planes perpendicular to one plane and parallel or inclined to other plane.	C178.3
6.	Isometric Projections	• Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa.	C178.4
7.	Overview of Computer Graphics	• Demonstrating knowledge of the theory of CAD software; Dialog boxes and windows; Shortcut menus; the Command Line; the Status Bar; Isometric Views of lines, Planes, Simple and compound Solids.	C178.5
8.	Customization & CAD Drawing	• CAD Drawing along with customization tools, Annotations, layering & other functions. Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Surface Modeling; Solid Modeling.	C178.5
9.	Demonstration of a simple team design project	• Technical 2D/3D orthographic and Isometric projections; Demonstration of a simple team design project.	C178.5

Evaluation Criteria Components	**Maximum Marks**
Mid-Term	20
End-Term	20
(Attendance + D2D)	60 (10+50)
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.	Bhatt N.D., Panchal V.M. & Ingle P.R., Engineering Drawing, Charotar Publishing House, 2014.
2.	Shah, M.B. & Rana B.C., Engineering Drawing and Computer Graphics, Pearson Education, 2008.
3.	Agrawal B. & Agrawal C. M., Engineering Graphics, TMH Publication, 2012.
4.	Narayana, K.L. & P Kannaiah , Text book on Engineering Drawing, Scitech Publishers, 2008

Basic Mathematics-2 (15B11MA212)

Course Description

Course Code	15B11MA212	**Semester** Even	**Semester:**II **Session** 2019-2020 **Month from:**January to June
Course Name	Basic Mathematics- 2		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Dr. Yogesh Gupta	
	Teacher(s) (Alphabetically)	Dr. Yogesh Gupta	

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C108.1	explain the basic concepts of convergence of series and Fourier series.	Understanding Level(C2)
C108.2	explain the concepts of two dimensional coordinate geometry.	Understanding Level(C2)
C108.3	explain the basic concepts of vectors and 3D coordinate geometry.	Understanding Level(C2)
C108.4	apply differentiation in scalar and vector valued functions.	Applying level(C3)
C108.5	classify and solve the ordinary differential equations with constant coefficients.	Applying level(C3)
C108.6	apply basic numerical methods for finding roots, interpolation and integration.	Applying Level(C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Sequence and Series	Convergence and divergence. Simple tests for convergence. Absolute convergence. Fourier series.	06
2.	Two dimensional coordinate Geometry	Cartesian coordinate system. Distance between two points. Equation of line in different forms. Equations of circle, ellipse and parabola. Equation of a tangent to a curve. Area of a triangle.	07
3.	Vectors and Coordinate Geometry	Vectors and their algebra. Simple applications to geometry and mechanics. Unit vectors, vectors i, j and k. Components of a vector. Position	08

	(3D)	vector. Direction cosines and direction ratios. Dot and cross products. Projection of a vector on another. Distance between two points. Equations of a line, plane and sphere.	
4.	Calculus of two or more variables	Partial differentiation. Taylor's series. Differentiation of a vector. Tangent to a curve. Gradient of a scalar.	09
5.	Elementary Differential Equations	Definitions of order, degree, linear, nonlinear, homogeneous and non-homogeneous. Solution of first order equations. Complementary function and particular integral. Initial and boundary value problems. Linear differential equations with constant coefficients.	07
6.	Numerical Methods	Solution of algebraic and transcendental equations – Bisection method, Newton-Raphson method. Linear and quadratic interpolation. Trapezoidal and Simpson's rule.	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, 10th Ed., John Wiley, 2015.