Jaypee Institute of Information Technology

Integrated M.Tech. Biotechnology

Semester I

Course Descriptions

Detailed Syllabus

Lecture-wise Breakup

Course Code	18B11CI111	**Semester Odd (specify Odd/Even)**	**Semester** I **Session** 2018 -2019 **Month from July to December**
Course Name	Fundamental of Computer Programming – I		
Credits	4	**Contact Hours**	3L+1T

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

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Explain basic structure of HTML web page using different tags such as table, links, formatting and frame etc.	Understand (C2)
CO2	Make use of Cascading style sheets and Java Scripts to develop web pages.	Apply (C3)
CO3	Explain SQL queries using MySQL to create database tables and retrieve the data from a single table.	Understand(C2)
CO4	Demonstrate the simple python programs using the constructs such as lists, tuples, dictionaries, conditions, and loops.	Understand(C2)
CO5	Classify Number System and explain Basics of Computer Systems	Understand (C2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	HTML	Basic structure of HTML and tags such as Headings, Paragraphs, Formatting, images, Tables, Lists and Frames	8
2.	Cascadding Style Sheets	CSS Introduction, Syntax, colors, backgrounds, borders, fonts, links, list, tables, Text.	6
3.	Java Script	JS introduction, Syntax, Comments, Variables, Operators, Arithmetic, Assignment, Data Types, Functions ans Strings	8
4.	Structure Query Language	SQL Intro, Syntax, Select, Insert, Update, Delete, min, max, count, avg, sum, wildcards, constraints and primary key	5

5.	Python	Python Intro, Syntax, Variables, Numbers, Casting, Strings, Operators, Lists, Tuples, Sets, Dictionaries, If else, While loops, For Loops, For Loops, Functions	10
6.	Number System and Introduction to Computes	Binary, Decimal , Octal and Hexadecimal number system, Conversion, Introduction to Computer, Memory, CPU, ALU	5
		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.	Laura Lemay, Rafe Colburn, Jennifer Kymin,"Mastering HTML, CSS & JavaScript Web Publishing" , BPB Publications
2.	Ivan Bayross, "Web Enabled Commercial Applications Development Using HTML, JavaScript, DHTML and PHP",BPB Publication
3.	Martin C. Brown,"The Complete Reference Python", TMH
4.	Avi Silberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6th edition, McGrawHill, 2010.
5.	User manuals supplied by department for SQL and Python

Detailed Syllabus

Lab-wise Breakup

Course Code	**18B15CI111**	**Semester** Odd **(specify Odd/Even)**	**Semester** I **Session** 2018 -2019 **Month from July to December**
Course Name	Computer Programming Lab I		
Credits	1	**Contact Hours**	**2**

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

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Demonstrate basic structure of HTML web page using different tags.	Understand (C2)
CO2	Develop web pages using table tag, formatting tag, and hyperlinks.	Apply (C3)
CO3	Make use of Cascading style sheets and Java Scripts to develop web pages.	Apply (C3)
CO4	Explain SQL queries using MySQL to create database tables and retrieve the data from a single table.	Understand (C2)
CO5	Demonstrate the simple python programs using the constructs such as lists, tuples, dictionaries, conditions, and loops.	Understand (C2)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Web page development using HTML	Basix structure of HTML, heading and formatting tags and attributes	CO1
2.	Table, hyper link and image insertion on webpage	Make use of anchor tag, image tag and table tag with different attributes.	CO2
3.	Cascading Style sheets	Make use of style sheets to develop more creative web page	CO3
4.	Java Script	Develop interactive web page using java script.	CO3

5.	Structured Query Language	Insert, Update and Delete operation on single table using SQL.	CO4
6.	Basic Programming on Python	Write a python programs using the constructs such as lists, tuples, dictionaries, conditions, and loops.	CO5

Evaluation Criteria

Components	**Maximum Marks**
Eval 1	15
Eval 2	1
Eval 3	15
Lab Test 1	20
Lab Test 2	20
TA	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.	Laura Lemay, Rafe Colburn, Jennifer Kymin,"Mastering HTML, CSS & JavaScript Web Publishing" , BPB Publications
2.	Ivan Bayross, "Web Enabled Commercial Applications Development Using HTML, JavaScript, DHTML and PHP",BPB Publication
3.	Martin C. Brown,"The Complete Reference Python", TMH
4.	Avi Silberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6th edition, McGrawHill, 2010.
5.	User manuals supplied by department for SQL and Python

Detailed Syllabus

Lecture-wise Breakup

Course Code	15B11MA112	**Semester** Odd **(specify Odd/Even)**	**Semester** I **Session** 2018 -2019 **Month from** July to December
Course Name	Basic Mathematics I		
Credits	4	**Contact Hours**	3-1-0
Faculty (Names)	**Coordinator(s)**	Prof. A. K. Aggarwal	
	Teacher(s) (Alphabetically)	Prof. A. K. Aggarwal	

COURSE OUTCOMES		**COGNITIVE LEVELS**
After pursuing the above mentioned course, the students will be able to:		
C107.1	explain the concepts of sets, relation and functions.	Understanding Level (C2)
C107.2	illustrate the concepts of complex numbers and their powers including roots.	Understanding Level (C2)
C107.3	discuss the concepts of limits, continuity and differentiability and solve related problems of differential calculus.	Applying Level (C3)
C107.4	utilize integral calculus to evaluate area under the curve.	Applying Level (C3)
C107.5	explain matrices and determinants to solve the system of linear equations.	Applying Level (C3)
C107.6	explain plane coordinate geometry to find equations of line, circle, parabola and ellipse.	Understanding Level (C2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Sets, Relations and Functions, Complex Numbers	Sets and their representation. Union, intersection and compliment. Mapping or function. One-one, onto mappings. Inverse and composite mappings. Complex Numbers: Definition and geometrical representation. Algebra. Complex conjugate. Modulus and amplitude. Polar form. DeMoivre's theorem. Roots of complex numbers. Simple functions.	10
2.	Differential and Integral Calculus	Basic concept of limit and continuity. Derivative. Rules of differentiation. Tangent to a curve. Taylor's series. Maxima and minima. Integral Calculus: Antiderivative. Fundamental theorem of calculus (statement only). Integrals of elementary functions. Substitution and partial fractions. Definite integral as a limit of sum. Properties of definite integrals. Application to areas and lengths.	15
3.	Matrices and Determinants	Matrices and Determinants: Algebra of matrices. Determinant of a square matrix. Properties of determinants.	08

		Some simple type of matrices. Inverse of a matrix. Solution of equations.	
4.	Two dimensional coordinate Geometry	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.	09
		Total number of Lectures	42

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz, Assignments, Tutorial)
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.	Finney, G. B., Calculus and analytical geometry, 11th Ed., Thomas, Pearson Education Asia (Adisson Wesley), New Delhi, 2011.
2.	Mathematics Textbook for Class XI, NCERT, 2018.
3.	Mathematics Textbook for Class XII, NCERT, 2018.
4.	Sharma, R.D., Mathematics, Dhanpat Rai Publications, New Delhi, 2018.

Detailed Syllabus

Lecture-wise Breakup

Course Code	**15B11PH112**	**Semester: Odd**	**Semester- I Session :** 2018 -2019 **Month from**July to December
Course Name	**Physics for Biotechnology**		
Credits	4	**Contact Hours**	4

Faculty (Names)	**Coordinator(s)**	Prof. Anirban Pathak
	Teacher(s) (Alphabetically)	Anirban Pathak

COURSE OUTCOMES		**COGNITIVE LEVELS**
C103.1	Relate historical development of optics, atomic physics and biomechanics to the modern concepts.	Remembering (C1)
C103.2	Explain the relevant concepts of optics, biomechanics, laser, atomic structure, bio-fluid mechanics, allometry and statistical distribution	Understanding (C2)
C103.3	Apply of mathematical principles and laws of physics in handling physical problems with a specific focus on the biological systems.	Applying (C3)
C103.4	Logically analyse biological systems using the laws of physics or biophysics	Analyzing (C4)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Physical Optics	Basic idea of wave and its mathematical representation, Physical optics in biotechnology, Analytical treatment of interference in Young's Double Slit experiment, Intensity distribution of fringe system, Fresnel's biprism, Newton's rings, Michelson interferometer and its application in measurement of thickness of thinfilms, Introduction to diffraction (limited to Fraunhofer class) from Single slit, double slit and Diffraction grating, Polarization, Birefringence, Practical polarizers, Quarter wave plates and half wave plates, Production and analysis of different types of polarized light. Optical activity, polarimeters and applications of optical activity in biological sciences.	19
2.	Biomechanics and allometry	Laws of Newtonian mechanics , Rigidity modulus, basic ideas of biomechanics and allometry, sports biomechanics	4
3.	Bio-fluid	Surface tension, Viscosity and flow of Newtonian fluid	6

	mechanics	(e.g., blood) in elastic channel (e.g., artery), Basic ideas of rheology, biofluid mechanics and, polar and non-polar solvents	
4.	Atomic Structure	Origin of spectral lines, spin and orbital angular momentum, Quantum numbers, Atoms in magnetic field, Zeeman effect.	7
5.	Statistical Distributions and Lasers	Principle and working of laser, Ruby Laser, Applications of lasers in biotechnology.	4
		Total number of Lectures	**40**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 [2 Quizes (10 M), Attendance (10 M) and Class 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.	Ghatak, *Optics*, Tata McGraw Hill.
2.	A. Beiser, *Concepts of Modern Physics*, Mc Graw Hill International.
3.	Size, Function, and life story, William A Calder III, Dover, New York, 1996
4.	An Introduction to Biomechanics: Solids and Fluids, Analysis and Design By Jay D. Humphrey, Sherry L. Delange, Springer, New York, 2003.

Detailed Syllabus

Lab-wise Breakup

Course Code	**15B17PH171**	**Semester** Odd	**Semester** I **Session** 2018 -2019 **Month from:** July to December
Course Name	Physics Lab-1		
Credits	01	**Contact Hours**	02

Faculty (Names)	**Coordinator(s)**	Himanshu Pandey and Anshu D. Varshney
	Teacher(s) (Alphabetically)	Alok Pratap Singh Chauhan, Amit Verma, Anuj Kumar, Anuraj Panwar, Anshu D. Varshney, Bhubesh Chander Joshi, D. K. Rai, Dinesh Tripathi, Manoj Kumar, Manoj Tripathi, N. K. Sharma, Navendu Goswami, Prashant Chauhan, S. C. Katyal, Sandeep Chhoker, Swati Rawal, Vikas Malik, Vivek Sajal

COURSE OUTCOMES		**COGNITIVE LEVELS**
C170.1	Recall optics and modern physics principles behind the experiments.	Remembering (C1)
C170.2	Explainthe experimental setup and the principles involved behind the experiments performed.	Understanding (C2)
C170.3	Plan the experiment and set the apparatus and take measurements.	Applying (C3)
C170.4	Analyze the data obtained and calculate the error.	Analyzing (C4)
C170.5	Interpret and justify the results.	Evaluating (C5)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Optics	**1.** To determine the wavelength of sodium light with the help of Newton's rings setup **2.**To determine the wavelength of sodium light with the help of Fresnel's Bi-prism **3.** To find the specific rotation of cane- sugar solution by a polarimeter at room temperature, using half-shade / Bi-quartz device. **4.** To determine the dispersive power of the material of a prism with the help of a spectrometer. **5.** To determine the wavelength of prominent spectral lines of mercury light by a plane transmission grating using normal incidence method	1-5

2.	Modern Physics	**6.** To study the Photoelectric effect and determine the value of Planck's constant. **7.** Determination of Planck's constant by measuring radiation in a fixed spectral range.	1-5
3.	Electricity and Magnetism	**8.** To verify Stefan's law by electrical method. **9.**To determine the resistance per unit length of Carey Foster's bridge wire and specific resistance of the material of the given wire using Carey Foster's bridge. **10.** To study the variation of magnetic field with distance, along the axis of Helmholtz galvanometer, and to estimate the radius of the coil.	1-5

Evaluation Criteria

Components	**Maximum Marks**
Mid Term Viva (V1)	20
End Term Viva (V2)	20
D2D	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.	Dey and Dutta, *Practical Physics*, Kalyani Publication.
2.	Experiment hand-outs.

Detailed Syllabus

Lab-wise Breakup

Course Code	18B15GE112	**Semester : Odd**	**Semester I** **Session** 2018 -2019 **Month from July to December**
Course Name	WORKSHOP		
Credits	1.5	**Contact Hours**	3

Faculty (Names)	**Coordinator(s)**	Nitesh Kumar
	Teacher(s) **(Alphabetically)**	Chandan kumar Madhu Jhariya Nitesh Kumar Vimal Saini

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Learn the basic of manufacturing environment and various safety measures associated with it.	Remembering (Level I)
CO2	Apply the appropriate tools to fabricate joints utilizing work-bench tools.	Applying (Level III)
CO3	Create various prototypes in the carpentry trade, fitting trade, welding trade and tin smithy trade.	Creating (Level VI)
CO4	Demonstrate the working principle of lathe, shaper and milling machines and able to fabricate the prototypes of desired shape and accuracies.	Understanding, (Level II)

Module No.	Title of the Module	List of Experiments
1.	Carpentry	Preparation of T joint as per the given specification. Preparation of Dovetail joint as per given specification.
2.	Welding Shop	To study Gas welding and Arc welding equipment. To make Butt joint and Lap joint.
3.	Sheet Metal Shop	To Prepare a Square tray using GI sheet. To Prepare a funnel using GI sheet.
4.	Fitting Shop	To Prepare V groove fit as per given specifications. To Prepare Square fit as per given specifications.
5.	Machine Shop	To Perform Turning, facing and grooving operation on Lathe. To perform Slotting operation on Shaper Machine. To perform face milling operation on Milling Machine.

Evaluation Criteria

Components	**Maximum Marks**
Mid Term Exam	20
End Term Exam	20
TA	60 (Experimental Work (30) + File Work (20) + 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.	Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai
2.	Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology",4th edition, Pearson Education India Edition, 2002.
3.	Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata Mc GrawHill House, 2017.
4.	John K.C., Mechanical Workshop Practice, 2nd Edition, PHI, 2010
5.	Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, Prentice Hall India, 1998
6.	Gowri P.Hariharan and A. Suresh Babu," Manufacturing Technology – I" Pearson Education, 2008
7.	Raghuwanshi B.S., Workshop Technology Vol. I & II, Dhanpath Rai & Sons.

Detailed Syllabus
Lecture-wise Breakup

Course Code	15B11HS112	**Semester**: Odd	**Semester**: I **Session** 2018 -2019 **Month** from July 18 to Dec 18	
Course Name	English			
Credits	3		**Contact Hours**	2-1-0
Faculty (Names)	**Coordinator(s)**	Ms Puneet Pannu, Dr Anshu Banwari		
	Teacher(s) (Alphabetically)	Dr Anshu Banwari, Dr Monali Bhattacharya, Dr Nilu Chaudhary, Dr Santosh Dev, Ms Puneet Pannu, Dr. Santoshi Sengupta, Dr Ekta Srivastava		

COURSE OUTCOMES		**COGNITIVE LEVELS**
C114.1	Develop an understanding and appreciate the basic aspects of English as a communication tool.	Understand (C2)
C114.2	Apply the acquired skills in delivering effective presentations	Apply (C3)
C114.3	Demonstrate an understanding of different forms of literature and rhetorical devices	Understand (C2)
C114.4	Examine literature as reflection of individual and society	Analyse (C4)
C114.5	Compose different forms of professional writing	Create (C6)
C114.6	Apply Phonetics through theory and practice for better pronunciation	Apply (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	English as a Communication Tool	Basic aspects of English ·LSRW: Listening, Speaking, Reading, Writing Non Verbal Communication: Body Language, Voice Modulation, Posture Gambits Phonetics: Pronunciation, Stress, Rhythm, Intonation	10
2.	Language through Literature	**Short Stories** ·Too Bad by Isaac Asimov ·The Castaway by Rabindranath Tagore **Poems** ·The Highwayman by Alfred Noyes ·Where the mind is without fear by Rabindranath Tagore ·"If" by Rudyard Kipling ·Ode to Clothes by Pablo Nerruda **One act Play** ·Refund by Fritz Karinthy	10

		Famous Speech ·Swami Vivekanand's Chicago Speech	
3.	Professional Application/Writing	Textual Organization ·Letter Writing ·Circulars ·Notices ·Agenda ·Minutes ·Report Writing	8
		Total number of Lectures	**28**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Assignment, Creative Project, Test, Oral Questions)
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.	**C.L.Bovee, J.V.Thill, M.Chaturvedi**, *Business Communication Today*,9th Ed, Pearson Education, copyright@ Dorling Kinderslay (India) Pvt Ltd,2009
2.	**Kelly M. Quintanilla and S.T.Wahl**, *Business and Professional Communication*, Sage Publications Pvt India Ltd,2011
3.	**S. Kumar and Pushp Lata,***Communication Skills*, Oxford University Press,1st, Ed. 2011
4.	**R.K Bansal, and J.B Harrison**, *Spoken English for India*, Orient Longman
5	**Alfred Noyes,** *"The Highwayman",*Oxford University Press, USA, Sep 1999
6	**Rabindranath Tagore,** *"Where the Mind is without Fear"***,** BK Classics
7	**Rudyard Kipling**, *"If",*If Handbook, Creative Editions, 2014
8	**Pablo Neruda,** *"Ode To Clothes"* Late & Posthumous Poems
9	**Isaac Asimov,** *"Too Bad"***,** Robot Visions, ROC Books, New York, NY, USA, 1991
10	**RabindraNath Tagore, "***The Castaway***",** Selected Short Stories, Introduction & translated by William Radice", Penguin Classics
11	**Fritz Karinthy,** "*The Refund*", A Play in One Act adapted by Percival Wilde, French's Acting Edition, London
12	**Swami Vivekananda & Sankar Srinivasan, "** Sisters & Brothers of America: Speech at World Parliament of Religions, Chicago, 1893", Creative Space Independent Publishing Platform, 2015