Jaypee Institute of Information Technology

B.Tech. Biotechnology

Semester I

Course Descriptions

Detailed Syllabus
Lecture-wise Breakup

Course Code	**15B11PH112**	**Semester: Odd**	**Semester: I Session:** 2019-2020 **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 mechanics	Surface tension, Viscosity and flow of Newtonian fluid (e.g., blood) in elastic channel (e.g., artery), Basic ideas of rheology, biofluid mechanics and, polar and non-polar solvents	6
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** 2019-2020 **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)	AlokPratap Singh Chauhan, Amit Verma, Anuj Kumar, AnurajPanwar, Anshu D. Varshney, BhubeshChander Joshi, D. K. Rai, Dinesh Tripathi, Manoj Kumar, ManojTripathi, N. K. Sharma, NavenduGoswami, Prashant Chauhan, S. C. Katyal, Sandeep Chhoker, Swati Rawal, Vikas Malik, VivekSajal

COURSE OUTCOMES		**COGNITIVE LEVELS**
C170.1	Recall optics and modern physics principles behind the experiments.	Remembering (C1)
C170.2	Explain the 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
Lecture-wise Breakup

Course Code	18B11CI111	**Semester Odd (specify Odd/Even)**	**Semester I Session** 2019 -2020 **Month from:** July to December
Course Name	Fundamental of Computer Programming – I (NBA Code: C111)		
Credits	4	**Contact Hours**	3L+1T

Faculty (Names)	**Coordinator(s)**	Dr. Shikha Jain
	Teacher(s) (Alphabetically)	Dr. Shikha Jain

COURSE OUTCOMES		**COGNITIVE LEVELS**
C111.1	Explain basic structure of HTML web page using different tags such as table, links, formatting and frame etc.	Understand (C2)
C111.2	Make use of Cascading style sheets and Java Scripts to develop web pages.	Apply (C3)
C111.3	Explain SQL queries using MySQL to create database tables and retrieve the data from a single table.	Understand(C2)
C111.4	Demonstrate the simple python programs using the constructs such as lists, tuples, dictionaries, conditions, and loops.	Understand(C2)
C111.5	Classify Number System and explain Basics of Computer Systems	Understand (C2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures**
1.	HTML	Basic structure of HTML and tags such as Headings, Paragraphs, Formatting, images, Tables, Lists and Frames	8
2.	Cascading 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 and 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.	AviSilberschatz, 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	15B11HS112	**Semester**: Odd	**Semester**: I **Session** 2019 -2020 **Monthfrom** Julyto December
Course Name	English		
Credits	3	**Contact Hours**	2-1-0

Faculty (Names)	**Coordinator(s)**	DrEktaSrivastava, Ms PuneetPannu
	Teacher(s) (Alphabetically)	DrAnshuBanwari, , DrEkta Srivastava, DrMonaliBhattacharya, DrNiluChaudhary, DrParineeta Singh, Ms PuneetPannu , DrSantosh Dev, Dr. SantoshiSengupta

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 **Famous Speech** ·Swami Vivekanand's Chicago Speech	10
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 (Creative Project, Lab 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 PushpLata,***Communication Skills*, Oxford University Press,1st, Ed. 2011
4.	**R.K Bansal, and J.B Harrison**, *Spoken English for India*, Orient Longman, 2018
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, 1968-74
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, 2005
11	**Fritz Karinthy,** "*The Refund*", A Play in One Act adapted by Percival Wilde, French's Acting Edition, London, 1958
12	**Swami Vivekananda &Sankar Srinivasan, "** Sisters & Brothers of America: Speech at World Parliament of Religions, Chicago, 1893", Creative Space Independent Publishing Platform, 2015

Detailed Syllabus
Lab-wise Breakup

Course Code	**18B15CI111**	**Semester**Odd **(specify Odd/Even)**	**Semester:I Session** 2019 -2020 **Month from:**July to December
Course Name	Computer Programming Lab I		
Credits	2	**Contact Hours**	**0-0-4**

Faculty (Names)	**Coordinator(s)**	Dr. K Vimal Kumar
	Teacher(s) (Alphabetically)	Mradula Sharma, Dr.Pawan Singh Mehra, Dr.Shikha Jain, Dr. K Vimal Kumar

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 hyper links.	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	Basic 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	15
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.	AviSilberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", 6th edition, McGrawHill, 2010.
5.	User manuals for mySQL& Python supplied by the department.

Detailed Syllabus
Lab-wise Breakup

Course Code	18B15GE112	**Semester :**Odd	**Semester:** I **Session:** 2019 -2020 **Month from:**July to December
Course Name	Workshop		
Credits	1.5	**Contact Hours**	03

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

COURSE OUTCOMES		**COGNITIVE LEVELS**
C179.1	Tell the basic of manufacturing environment and various safety measures associated with it.	Remembering Level (C1)
C179.2	Apply the appropriate tools to fabricate joints utilizing work-bench tools.	Applying Level (C3)
C179.3	Create various prototypes in the carpentry trade, fitting trade, and welding trade	Creating Level (C6)
C179.4	Demonstrate the working principle of lathe, shaper and milling machines and able to fabricate the prototypes of desired shape and accuracies.	Understanding Level(C2)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Carpentry	Preparation of T joint as per the given specification. Preparation of dovetail joint/ cross lap joint as per given specification.	**C179.2, C179.3**
2.	Welding Shop	To study Gas welding and Arc welding equipment and various safety measures associated with it. To make butt joint and lap joint.	**C179.1**, **C179.2, C179.3**
3.	Sheet Metal Shop	To prepare a square tray using GI sheet. To prepare a funnel using GI sheet.	**C179.2, C179.3**
4.	Fitting Shop	To prepare V- groove fit as per given specifications. To prepare square fit as per given specifications.	**C179.2, C179.3**
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.	**C179.4**

Evaluation Criteria

Components	**Maximum Marks**
Viva 1	20
Viva 2	20
Report file, Attendance, and D2D	60 [File Work (20) + Attendance (10)+(Experimental Work (30)]
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.	GowriP.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	15B11MA112	**Semester**Odd **(specify Odd/Even)**	**Semester:**I **Session** 2019 -2020 **Month from:**July to December
Course Name	Basic Mathematics 1		
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)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Sets, Relations and Functions	Sets and their representation. Union, intersection and compliment. Mapping or function. One-one, onto mappings, Inverse and composite mappings, **Relation and their representation, types of relations, equivalence relation, partial order relation.**	10
2.	Complex Numbers	Definition and geometrical representation. Algebra. Complex conjugate. Modulus and amplitude. Polar form. DeMoivre's theorem. Roots of complex numbers. Simple functions.	8
3.	Differential Calculus	Basic concept of limit and continuity. Derivative. Rules of differentiation. Tangent to a curve. Taylor's series. Maxima and minima.	8
4	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.	8
5.	Matrices and Determinants	Matrices and Determinants: Algebra of matrices. Determinant of a square matrix. Properties of determinants. Some simple type of matrices. Inverse of a matrix. Solution of equations.	8

		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.