Dr. M.G.R EDUCATIONAL AND RESEARCH INSTITUTE (Deemed to be University U/s 3 of the UGC Act 1956)



DEPARTMENT OF BIOTECHNOLOGY

B.Sc - BIOCHEMISTRY COURSE

2017 Regulations



C. B. Palaminde

REGISTRAR Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE (Deemed to be University) Periyar E.V.R. High Road, Maduravoyal, Chennai 600 095

DEPARTMENT VISION

To be a key driver of economic growth by stimulating the regional innovation system becomes a hub for development of key innovative industrial products processes leading to the creation of spin out, spin along and spin in companies.

MISSION STATEMENT

- **1.** To provide knowledge in biological processes to apply the learned skills in research discoveries to improve human health, protect environment and to enrich economy.
- **2.** To provide an outstanding environment of learning where students and faculty can apply the knowledge innovatively to create useful products or processes for the society.
- 3. We focus on excellence in research and teaching, as well as service to the community

CORE VALUES

Intellectual curiosity Individual opportunity Integrity, truth and empathy Fun

Program Educational Objectives

PEOs reflect the career and professional accomplishments of graduates. The PEOs of the B.Sc Biochemistry course follows:

PEO 1: Pursue higher studies or be employed in Biochemistry or related disciplines. **PEO2:** Be a successful entrepreneur in creating jobs related to applied science and Technology

PEO 3: Promote ethics, sustainability and environmental responsibility in their practice **PROGRAMME OUTCOMES**

PO1: Disciplinary knowledge:	Capable of demonstrating comprehensive knowledge and						
	understanding of one or more disciplines that form a part of the						
	undergraduate programme of study.						
PO2: Communication Skills	Ability to understand and express thoughts and ideas effectively in						
	writing and orally; to present complex information in a clear and						
	concise manner to different groups.						
PO3:Critical thinking and Problem	Capability to analyze and evaluate evidence, arguments, claims,						
solving:	beliefs on the basis of empirical evidence; formulate coherent						
0	arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development and apply						
	blowing scientific approach to knowledge development and apply blowing scientific approach to knowledge development and apply to						
	their competency to solve different kinds of problems and apply to						
	real life situations.						
PO4: Analytical and Scientific	Ability to analyze, interpret and draw conclusions from						
reasoning:	quantitative/qualitative data; and critically evaluate ideas, evidence						
8	and experiences from an open-minded and reasoned perspective.						
PO5:Research-related skills:	Ability to recognize cause-and-effect relationships, define problems,						
	formulate hypotheses, test hypotheses, analyze, interpret and draw						
	conclusions from data, ability to plan, execute and report the results of						
	an experiment or investigation.						

PO6: Team work and Leadership	: Function effectively as an individual, and as a team member or
qualities	leader in diverse teams, and in multidisciplinary environment.
PO7:Information/digital literacy:	Capability to use ICT tools in a variety of learning situations,
	demonstrate ability to access, evaluate, and use a variety of relevant
	information sources; and use appropriate software for analysis of data
	and further presentation.
PO8: Moral and ethical awareness:	Ability to embrace moral/ethical values in conducting one's life,
	formulate a position/argument about an ethical issue from multiple
	perspectives, and use ethical practices in all work. Appreciating
	environmental and sustainability issues; and adopting objective,
	unbiased and truthful actions in all aspects of work
PO9: Lifelong learning:	Ability to update knowledge and skills, participating in learning
	activities throughout life, through self-paced and self-directed learning
	aimed at personal development, meeting economic, social and cultural
	objectives

Program specific outcomes

PSO1	Graduates will be able to apply to understand the major biological concepts, analyse the problem, design/develop, and apply the appropriate technique and ability to implement in the various sector in the field of biochemistry.
PSO2	Graduates will be able to apply reasoning informed by the contextual knowledge in societal and environmental contexts and understanding of ethical choices inherent in Biochemistry field
PSO3	Graduates will be able to put into practice of lifelong learning and apply his/her knowledge in interpersonal and entrepreneurial skills, with strong communication and efficient and able to work in team set.

PEO WITH MISSION STATEMENT

	M1	M2	M3
PEO1	Н	М	Н
PEO2	М	Н	М
PEO3	Н	Н	Н

PEO-PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
PEO1	Н	Н	Н	Н	Н	Н	Μ	Н	Н
PEO2	Μ	Μ	Н	Н	Н	Н	Н	Н	Η
PEO3	Н	Н	Н	Н	Н	Н	Μ	Μ	Η

PEO-PSO

	PSO1	PSO2	PSO3
PEO1	Н	Н	Н
PEO2	Н	Н	Н
PEO3	Н	Н	Н

Dr. M.G.R EDUCATIONAL AND RESEARCH INSTITUTE UNIVERSITY DEPT. OF BIOTECHNOLOGY

B.Sc. - BIOCHEMISTRY COURSE – 2017

CREDIT DISTRIBUTION

I semester	20
II semester	20
III semester	24
IV semester	22
V semester	23
VI semester	21

TOTAL 130

Dr. M.G.R. Educational and Research Institute University Department of Biochemistry Curriculum& Syllabus

	I SEMESTER						
Sub Code	Subjects	L	Т	Р	С		
Theory							
HBTA17001	Part-I : Tamil /Hindi/French – Paper-I	3	0	0	3		
HBEN17001	Part-II : English - Paper I	3	0	0	3		
HBCH19BA1	Allied I: Chemistry-I	3	1	0	4		
HBBT19B01	Cell Biology & Genetics	3	1	0	4		
HBBT19B02	Fundamentals of Computers	3	1	0	4		
Laboratory/Practice							
HBBT19BL1	Chemistry Lab	0	0	3	2		
Total credits	20						

II SEMESTER							
Sub Code	Subjects	L	Т	Р	С		
Theory							
HBTA17002	Part-I : Tamil/Hindi/French - Paper II	3	0	0	3		
HBEN17002	Part -II: English – Paper II	3	0	0	3		
HBCH19BA2	Allied II : Chemistry-II	3	1	0	4		
HBBT19B03	Bio Molecular Chemistry	3	1	0	4		
HBBT19B04	Molecular Biology	3	1	0	4		
	Laboratory/Practice						
HBBT19BL2	Biochemistry Lab	0	0	3	2		
Total credits	20						

III SEMESTER								
Sub Code	Subjects	L	Т	Р	С			
	Theory							
HBBT19B05	Instrumentation methods and Analysis	3	1	0	4			
HBMA19BA3	Allied III : Biostatistics -I	3	1	0	4			
HBBT19B06	Enzymology	3	1	0	4			
HBBT19B07	Human physiology	3	1	0	4			
HBBT19B08	R-DNA Technology	3	1	0	4			
HBMG17L01	Soft skill I	1	0	2	2			
	Laboratory/Practice							
HBBT19BL3	Instrumentation methods and Analysis Lab	0	0	3	2			
Total credits	24							

IV SEMESTER							
Sub Code	Subjects	L	Т	Р	С		
Theory							
HBMA19BA4	Allied IV : Biostatistics-II	3	1	0	4		
HBBT19B09	Intermediary Metabolism-I	3	1	0	4		
HBBT19B10	Immunology	3	1	0	4		
HBBT19B11	Microbiology	3	1	0	4		
HBMG17L02	Soft skill II	1	0	2	2		
	Laboratory/Practice						
HBBT19BL4	Immunology Lab	0	0	3	2		
HBBT19BL5	Microbiology Lab	0	0	3	2		
Total credits	22						

V SEMESTER								
Sub Code	Subjects	L	Т	Р	C			
	Theory							
HBBT19B12	Intermediary Metabolism- II	3	1	0	4			
HBBT19B13	Clinical Biochemistry	3	1	0	4			
HBBT19B14	Food & Nutrition	3	1	0	4			
HBMG17001	Environmental studies	3	0	0	3			
HBBT19B15	Basic Pharmaceutical Sciences	3	1	0	4			
	Laboratory/Practice							
HBBT19BL6	Clinical Biochemistry lab	0	0	3	2			
HBBT19BL7	Food and Enzyme Analysis Lab	0	0	3	2			
Total credits	23							

VI SEMESTER												
Sub Code	Subjects	L	Т	P	С							
Theory												
HBBT19B16	Data Base Management	3	1	0	4							
HBBT19B17	Basic Bioinformatics	0	1	0	4							
HBMG17G01	Entrepreneurial Development	3	0	0	3							
	Laboratory/Practice											
HBBT17P01	Project work & Viva-voce	0	0	24	10							
Total credits	21											

I SEMESTER

PART-I : TAMIL/HINDI/FRENCH -PAPER I L T P C 3 0 0 3

Dr.M.G.R 43 **EDUCATIONAL & RESEARCH INSTITUTE** E UNIVERSITY (Declared U/S 3 of the UGC Act 1956) B.B.A., BCA., B.Sc., B.Com முதல் பருவம் நோக்கம்: ≽ வாய்மொழி இலக்கியத்தையும் செய்யுள் இலக்கியத்தையும் அறிந்து கொள்ளல் ≻ சிறுகதை மரபினைப்புரிந்து கொள்ளல் > பிழைஇன்றித்தமிழ் எழுதுவதற்கு அடிப்படை இலக்கணத்தைப்பயிற்றுவித்தல் > கவிதை மரபினையும் சிறுகதை மரபினையும் வரலாற்று நிலையிலிருந்து விளக்குதல் தமிழ் - தாள் I அலகு – 1 1. தாலாட்டு 2. காகல் 3. ஒப்பாரி 4. காணிநிலம் வேண்டும் - பாரதி 5. நல்லதோர் வீணை — பாரதி தமிழ்க்காதல் - பாரதிதாசன்
 தமிழ்வளர்ச்சி – பாரதிதாசன் 8. எந்நாளோ? – பாரதிதாசன் 9. ஆறு தன் வரலாறு கூறுதல் - கவிமணி தேசிய விநாயகம் பிள்ளை නුබාල – 2 Biman Saissi guiyanyise 1. வழித்துணை – ந.பிச்சமூர்த்தி ஒருடர்களின் பானை – அப்துலரகுமான்
 முள் முள் முள் சிற்பி Hagilillubang. Prof. Dr. S. DINAKARAN JOINT REGISTRAR அலகு -3 புதுமைப்பித்தன் கதைகள் 1. கடவுளும் கந்தசாமிப் பிள்ளையும் செல்லம்மாள்
 துன்பக்கேணி Dr. M.G.R. Educational and Research Institute ஆற்றங்கரைப் பிள்ளையார்
 ஒருநாள் கழிந்தது University (Decl. u/s.3 of UGC Act, 1956) Periyar E.V.R. High Road නුභාල -4 Maduravoyal, Chennai - 600 095 1. பெயர், வினை, இடை, உரிச்சொற்களின் பொது இலக்கணம், வலிமிகும் இடங்கள், வலிமிகா இடங்கள். නුභාල – 5 1. தமிழ்க் கவிதையின் தோற்றமும் வளர்ச்சியும் (மரபுக்கவிதை, புதுக்கவிதை) ப்பில் 2. தமிழ்ச்சிழுகதையின் தோற்றமும் வளர்ச்சியும் மரபுத் தொடர்கள், பொருந்தியசொல் தருதல் கலைச் சொற்கள், நேர்காணல் \$ 1001-100) பாலிக்கு கேன்னைப் பல்கலைக்கழக வெளியீடு – 2013 EDUCATIONAL AND R2SE வெள்து இலக்கணம். தமிழ்த்துனறத் தலைவர் டாக்டா எம்.ஜி.ஆர். கல்வி மற்றும் ஆராய்ச்சி நிறுவனம் UNIVERSITY பல்கலைக்கழகம் மதுரவாயல், சென்னை - 600 095

1	Dr.M.G.R. Educational and Research UNIVERSITY	h Institute	
	DEPARTMENT OF COMPUTER A	APPLICATIONS	
BHI13	HINDI – I	3 0 0 3	
Prose, A	dministrative Hindi and Grammer.		
UNIT I	Sabhvata kaa rabasya Jasson and amototice of a single	9 Hrs	
2.	Administrative terms (Prayojan mulak Hindi)	answers,	
UNIT I	1	9 Hrs	. *.
1. 2.	Mitratha ka rahasya - lesson and annotations questions and Patra lekhan, definitions, correspondence in hindi	answers //	
UNIT II	1	/ 9 Hrs	
1. 2.	Paramanu oorja evam and kadhya sanrakshan (lesson) anno Technical terms and words, letter writing	stations and answers,	
UNIT IV	1	9 Hrs	
1. 2. 3	Yuvavon se (lesson), annotations, essay and questions and an Types of official correspondence, technical terms	Iswers	
UNIT V	,	0.17-	
1. 2.	Yogyata aur vyavasay ka chunav (Lesson) essay, questions a Letter writing	of answers	
3.	grammer & technical terms		
		Total no of Hrs: 45	

REFERENCES

Dr. Syed Rahmatullah & Poornima Prakashan, *Hindi gadhya maala* Dr. Syed Rahmatullah & Poornima Prakashan, *Prayojanmulak Hindi* Dakshin Bharat Hindi Prachara Sabha, T.Nagar, *Saral Hindi Vyakaran-2*

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Bachelor of Computer Applications (BCA)

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ENGLISH - PAPER I

L T P C 3 0 0 3



HEAD DEPARTMENT OF ENGLISH DUCA AN OH INSTRUCT Checkel 600.095

SEMESTER I From the Academic Year 2017-2018

COURSE OBJECTIVES:

1. to prepare students for attaining a comprehensive knowledge of the communication skills 2. to make them understand the nuances of the language and use its vocabulary in appropriate contexts

3. to develop in students a knowledge of the various techniques in language use

4. to develop in them analytical and interpretative skills

5. to train learners in organized academic and business writing

Unit I-PROSE- For Detailed Study

1.	On Running After One's Hat	G.K. Chesterton
2.	The Unexpected	Robert Lynd
3.	How to be a Doctor	Stephen Leacock

Unit II- POETRY- For Detailed Study

1.	Ulysses	Lord Tennyson
2.	If	Rudyard Kipling
3.	Leave this Chanting and Singing	Rabindranath Tagore

Unit III- SHORT STORY

1. A Retrieved Reformation	O'Henry	
2 Easter Territ		

2. Engine Trouble R.K. Narayan

Unit IV – GLIMPSES FROM GREAT MINDS

1.	I lived with words	R.L. Stevenson
2.	My Vision for India	Dr. APJ Abdul Kalam

Unit V - FUNCTIONAL ENGLISH

Enhancing LSRW Skills through Tasks

Note: Each lesson to be followed by text-based Vocabulary, Grammar, and Usage Exercises

Synonyms, Antonyms- Affixes (prefixes & Suffixes)-Noun- Adjectives, Verb, Tense, Adverb, Preposition, 'if' clause, Articles, discourse markers, Reported and Direct speech- Voice, Degrees of comparison, Interrogatives Comprehension, Précis writing

Renteda

HEAD DEPARTMENT OF ENGLISH Drill G.R. EDUCATION A STRATCH INST ELECTRONIC CONTRACTORY Cheminar - 600 005

Subjec	t Code:		Su	bject Nam	ne : CHEI	MISTRY-	-1					L	т		Ρ	С
HBCE	119BA1		Pr	erequisite	Chemis	try						3	1		0	4
	L : Lect	ure T : 1	Futorial	P : Proje	ct C: Cr	edits										
	OBJEC	TIVE :														
	•	To unc	lerstand	d the scien	ce that	involves	the stu	dy of the	e compo	sition, st	ructure a	and pro	perties	of ma	tter.	it
		is a cre	eative d	iscipline cl	niefly co	ncerned	l with at	omic an	d molec	ular stru	cture and	d its cha	ange, foi	r insta	ance	
	COURS	SE OUTC	OMES	COs) : End	ons. I of cou	rse stud	lents wi	ll able to)							
CO1			Т	o understa	and and	study al	bout the	atomic	structu	re and ch	nemical b	onding	betwee	n the		
			n	nolecules								0				
CO2			Т	o know th	e conce	pt of ene	ergetics	of mole	clues ind	cluding p	hysical ti	ransfor	mation a	and fr	ee	
			e	nergy cha	nge											
CO3			To study about the aromatic compounds and stereochemistry of the molecules													
	Mapping of Course Outcomes with Program Outcomes (POs)															
<u> </u>		DO1	002	002	DO 4	DOF	DOC	007	DO	DO0	1					
COS/P	Us	P01	POZ	PO3	P04	P05	P06	P07	P08	P09						
CO1		М	М	н	Μ	М	М	L	Μ	L						
CO2		м	М	н	м	м	Μ	L	М	L						
COs / I	PSOs	PS	01	PSC	02		PS	03								
CO1		ŀ	1	н			ł	H								
CO2		ŀ	1	н			H	Η								
	H/M/L	. indicat	es Strei	ngth of Co	rrelatio	n H-Hi	igh, M- I	Medium	, L-Low		1			l		
	•			_						_						
		10	lces	ocia		7	es	S	t	nica						
		nces	cier	d S SS	Core	Illied	sctiv	tive	roje	-ech	lls					
		Sciel	ng S	s an ence	me	A L	ו Ele	Elect	I / P	s / T kill	Skil					
		isic 3	eeri	nitie Scie	ogr	ogra	gran	l nəu	ctica	ship S	Soft					
		Ва	ngin	mai	Pr	Pro	Prog	ğ	Prac	ern:						
			Ξ	μ						Int						
	-					~										

Chemistry – I L T P C 3 1 0 4 HBCH19BA1

Unit-IATOMIC STRUCTURE

Electronic configuration-Aufbau principle-Pauli's exclusion principle-Hund's rule- VSEPR Theory: H₂O, NH₃,CH₄,BrF₃,IF₅,IF₇- Molecular Orbital Theory: H₂, He₂, N₂, O₂, F₂.

Unit – IICHEMICAL BONDING-

Covalent bond-Orbital overlap, hybridization and geometry of CH_4, C_2H_4, C_2H_2 , and C_6H_6 moleculesorbital overlap –s-s, s-p, hybridization, sp3,sp2sp-withexamples. Inductive effect, electromeric effect, mesomeric effect and steric effect.

Unit – IIIENERGETICS:

Types of systems and processes, statement of first law. Need for II law. Carnot's cycle and efficiency. Entropy – its significance; in physical transformations. Free energy change and its importance. Conditions for spontaneity in terms of S and G.Relationship between G,H, T and S.

Unit – IVAROMATIC COMPOUNDS

Aromaticity, Huckle's rule. Mechanism of nitration, halogenations, alkylation, acylation and sulphonation of benzene. Heterocyclic chemistry-preparation and properties of pyrrole, furan, thiophene and pyridine.

Unit-V STEREO CHEMISTRY

Elements of symmetry, cause of optical activity, Isomerism of tartaric acid racemisation and resolution. Geometrical isomerism, keto-enol tautomrrism, conformation of n-butane.

Total No of Periods: 60

References

- Text Book of Allied Chemistry by Dr. Veeraiyan
- Allied Chemistry I& II by Venkatashwarn, Vaidhyanathan and Ramaswamy

(12Hrs)

(12Hrs)

(12 Hrs)

(12Hrs)

(12 Hrs)

Subject Cod	e: Si	ubject Na	ame : CE		OGY & G	GENETIC	S			L	т		Р	С
HBBT19B01	L Pi	rerequisi	te: Nil							3	1		0	4
L : Lecture T :	Tutoria	al P:Pr	oject C	: Credits										
OBJECTIVE	:													
To recollect t	he kno	wledge o	n proka	ryotic ar	nd eukar	yotic cel	lls, cell d	ivision ar	nd cell	orga	nelles. 1	Γo ur	nderst	and
transport me	chanisr	n across	cell mer	nbrane.	To learr	the bas	sics of ce	ll signalir	ng thro	ugh	binding	of a	ligand	to its
receptor.	COURSE OUTCOMES (COs) : Upon completion of this course, the students													
COURSEOUT	CONSE OUTCOMES (COS) . Opon complexion of this course, the students													
CO1	Wo	Ild have deeper understanding of cell at structural and functional level.												
CO2	Wo	uld have	broad k	nowledg	ge on the	etweer	n cell	ls and si	gnal	transo	luction			
	and	hormon	al signal	ing			6 . 1							
CO3	Wo	uld demo	onstrate	a clear ι	understa	inding of	t the							
Mapping of C	Mapping of Course Outcomes with Program Outcomes (POs)													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9					
CO1	Н	L	М	М	М	L	L	L	Н					
CO2	Н	L	М	М	М	L	L	L	Н					
CO3	Н	L	М	М	М	L	L	L	Н					
COs / PSOs	PS	501	PS	02	PS	03								
CO1		М	l	Н		н								
CO2		Μ	l	Н	I	Н								
CO3		Μ	l	н	I	н								
H/M/L indica	tes Str	ength of	Correla	tion H	- High, N	/I- Medi	um, L-Lo	w						
		nces			S		ц							
	SS	Scie	and	ē	ctive	es	ojec	. =						
	ence	ing	cien a	Cor	Ē	ectiv	/ Pr	ips /	s					
	c Sci	neei	anit al Sc	ram	ram) Ele	tical	'nsh nica	Skill					
	Basic	Engi	Hum Socia	Social Program Oper Pract Tech										
				~										

UNIT I:CELLS AND ORGANELLES

Cells and organelles, Functions of membranes, models of membrane architecture, transport across membranes - simple diffusion, facilitated diffusion through carrier proteins and channel proteins, active transport, energetics of transport, Cell division in prokaryotes and eukaryotes (mitosis and meiosis), Cell cycle, and cell cycle regulation.

UNIT II: ENDOMEMBRANE SYSTEMS AND PEROXISOMES 12Hrs

Structure of ER and glogi complex; Role of ER and golgi complex in protein glycosylation, secretary pathways, protein trafficking, exocytosis, endocytosis, coated vesicles in cellular transport processes; Lysosomes and cellular digestion. Role of plant vacuole and peroxisomes.

UNITIII:SIGNALTRANSDUCTION 12Hrs

Signal transduction through messengers and receptors. Chemical signals and cellular receptors; G-Protein linked receptors, protein kinase associated receptors, hormonal signaling

UNIT IV: MENDELIAN LAWS OF INHERITANCE

Mendelian laws of inheritance, composition of chromatin, Prokaryotic and Eukaryotic genome organization, Different types of chromosomes (polytene and lamp brush chromosome, giant chromosomes), sex determination inanimals.Non-disjunction of X chromosomes,linkage and crossing over.

UNIT V: GENETIC DISORDERS

Genetic disorders: Autosomal dominant disorders, sex linked inheritance, Multiple alleles ABO blood groups, Rh incompatibity, Principles of Hardy Weinberg law-Gene frequency, genotype frequency.

Total no of periods = 60

References/ Text books

- Cell Biology, De Roberties & De Roberties, Blaze publishers & Distributors Pvt. Ltd., New Delhi, 2001.
- Molecular cell Biology (III rd Edition), Harvey Lodish, David Baltimore et al., W.H. Freeman, 2000.
- Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, 2007. Molecular Biology of the Cell, Fifth edition. Garland Science.
- Hartl L D and Jones B, Analysis of genes and genomes, 3rd Edition, Jones and Bartlett Publishers, 1994.
- Principles of Genetics. 8th edition by Gardner, Simmons and Snustad. 2002.

12Hrs

12Hrs

12Hrs

Subject Cod	e: Si	ubject Na	ame : Fl	JNDAM		L	Т		Р	С					
HBBT19B02	2 Pi	rerequisi	te: Nil							3	1		0	4	
L : Lecture T :	Tutoria	al P:Pro	oject C	Credits							1				
OBJECTIVE	:														
To understan	d the b	asic cono	cept and	aspect	of comp	uter scie	ence like	problem	solvi	ng, ai	n esser	ntials	skill for	life. To	
study the des	ign, de	velopme	nt and a	nalysis o	of softwa	are and h	nardwar	e used to	solve	e prol	olems	in a v	ariety o	of	
business, scie	business, scientific and social contexts.														
COURSE OUTCOMES (COs) : Upon completion of this course, the students															
CO1	Toh	o have basic understanding about the computer and its essential features													
CO2	Tog	get the knowledge of software and internet uses and advantages													
CO3	Stud	Idying C Language and array.													
Mapping of C	Course	Outcome	es with F	Program	Outcom	nes (POs)								
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PO9						
003/103	101	102	105	104	105	100	107	100	105						
CO1	L	L	L	L	м	L	Н	L	Μ						
CO2	L	L	L	L	м	L	Н	L	Μ						
CO3	L	L	L	L	м	L	н	L	Μ						
COs / PSOs	PS	501	PS	02	PS	03		1							
CO1		М	ŀ	1	ŀ	1									
CO2		М	ł	4	•	4									
CO3		М	ł	4	ŀ	1									
H/M/L indica	ites Str	ength of	Correla	tion H-	· High, N	1- Mediu	um, L-Lo	w							
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	-			_ _		-									

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UNIT I :INTRODUCTION TO COMPUTER	12Hrs
Introduction to Computer – Characteristics Of Computer – Evolution Of Com Generation – Classification Of Computer – Basic Computer Organization – N	ıputer – Computer umber System.
UNITII: COMPUTER SOFTWARE software -types of software – software development steps- operating system – commands.	12Hrs dos- introduction -dos
UNIT III: COMPUTER COMMUNICATION AND INTERNET INTERNET	12Hrs
Internet Basic – IP Addressing – Domain & Host name – Types of Serves – DNS – W	VWW – Internet.

FUNDAMENTALS OF COMPUTERS

UNIT IV: C LANGUAGE OVERVIEW OF C

Constants, Variables & Data Types -Operators & Expression – Managing Input & Output Operators – Decision Making – Branching and Looping.

UNIT V: C Language array

Pointer-Handling Of character stings – User Defined Functions- Definitions – Declaration – Call by Reference - call by value – Structure- Union – File Handling.

Total no of periods = 60

12Hrs

12Hrs

LTPC

TEXT BOOK:

HBBT19B02

- Ashok N.Kamthane, computer programming pearson education (India) (2008)
- Behrouz A.Forouzan& Richard F. Gilbag "A structural programming Approach using C. IInd edition Brooks cole Thomson Leaning publication (2007)

Subject Code:	Subj	ject Na	ame : C	HEMIST	RY LAI	В				L		Т	Р	C	
HBBT19BL1	Prer	equisi	te: Che	mistry						0		0	3	2	
L : Lecture T : Tu	torial	P : P	roject	C: Credi	ts										
OBJECTIVE :								_			_				
To learn	and ι	unders	stand th	e princi	ples b	ehind th	e qualita	ative ar	id quan	titative	estii	matio	n of mol	ecules	
COURSE OUT	CON	IES (C	COs):	Studer	nts wi	ll acqu	ire kno	wleda	e abou	ıt					
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01	mole	c chen ecules	nistry ca	alculatio	ns and	a genera	ai chemio	carread	tions to	or the la	entii	icatic	on or an	erent	
CO2	Qua	Quantitative estimation of different important molecules													
CO3	Und	Jnderstanding of various analysis process and instruments used for estimation													
Mapping of Course Outcomes with Program Outcomes (POs)															
COs/POs	РО	PO2	2 PO	3 P	04	PO5	PO6	PO7	PO8	PO9					
	1														
CO1	м	L	M		н	н	н	L	М	м					
CO2	М	L	M		H	н	н	L	Μ	Μ					
CO2	М	L	M		Η	Н	н	L	М	М					
COs / PSOs	Р	SO1		PSO2		PS	03								
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CO2		Н		н		I	н								
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HBBT19BL1	Chemistry Lab	LTPC	0	0	3	1

I. Acidimetry

- 1. Estimation of sodium hydroxide standard sodium carbonate.
- 2. Estimation of bicarbonate and carbonate in a mixture

II. Permanganometry

- 1. Estimation of oxalic acid standard Mohrs salt or ferrous sulphate.
- 2. Estimation of calcium
- 3. Estimation of sodium nitrite-std. Oxalic acid.
- 4. Estimation of ferric ion.

III. Complexometry

- 1. Estimation of zinc or magnesium using EDTA.
- 2. Estimation of zinc using potassium ferro cyanide.
- 3. Estimation of temporary and permanent hardness of water.

II SEMESTER

PART-II : TAMIL/HINDI/FRENCH -PAPER IIL T P C3 0 0 3

டாக்டர். எம்.ஜி.ஆர். கல்வி மற்றும் ஆராய்ச்சி நிறுவனம் பல்கலைக்கழகம் அடையாளம்பட்டு, சென்னை — 600 095. தமிழ்த்துறை இரண்டாம் பருவம் ~ தமிழ்த்தாள்~11 பாடப்பகுதிகள் அலக~1 1. சிற்றிலக்கிய வரலாறு 2. கிறித்தவ இலக்கிய வரலாறு 3. இசுலாமிய இலக்கிய வரலாறு அலகு-11 4. நந்திக் கலம்பகம் . 5. முத்தொள்ளாயிரம் 6. தமிழ்விடு தாது , tollarist Juy 5 yist அலகு~111 · vyuinte Brat. 7. திருக்குற்றாலக் குறவஞ்சி Stories and Join 8. முக்கூடற்பள்ளு 9. இயேசுபிரான் பீள்ளைத்தமிழ் Prof. Dr. S. DINAKARAN JOINT REGISTRAR Dr. M.G.R. Educational and Research Institut அல**ர~**1∨ University (Decl. u/s.3 of UGC Act, 1956) Periyar E.V.B. High Road Maduravoyal, Chennai-500 091 10. நளவெண்பர் 11. ອົງກາບໍ່ປຸງກະຫຼາຍ ୬IN&~ V மொழிப்பயிற்சி : பண்புத்தொகை, வினைத்தொகை, உம்மைத்தொகை, உருவகம், உவமைத்தொகை, வேற்றமைத்தொகை, அன்மொழித்தொகை, இருபெயரொட்டுப் பண்புத்தொகை. ஒரு பொருள் குறித்த பலசொல், பல பொருள் குறித்த ஒரு சொல், அகரவரிசைப்படுத்துதல், ஒருமை, பன்மை மயக்கம், பிறமொழிச் சொற்களை நீக்குதல். பார்வை நூல்கள் : 1. ടെഞ്ഞെവ് വல்ക്കാക്കുളക ബെണ്ഫ്6്~2013 Tachor. 2. பொது இலக்கணம் JUMBN Standad USAMB

Vice Chancellor Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE UNIVERSITY தமிழ்த்துறைத் தலைவர் டாக்டர் எம்.ஜி.ஆர். கல்வி மற்றும் ஆராய்ச்சி நிறுவனம் பல்கலைக்கழகம் மதுரவாயல், சென்னை - 600,095 Dr. M.G.R Educational and Research Institute University

New Syllabus

Hindi – Semester II – Paper – II (Poetry, Hindi Computing, Alankar) Unit – I

1. Poetry – VirPooja, Kaidi aur Kokila – Kavi Parichay, Annotation, Summary

Makhanlal Chaturvedi

2. Poetry – Kabirdass – Sakhi – Kantasth 01 – 10 (Doha)

3. Alankar – Aupras and Upama only.

Unit – II

1. Poetry – Aansu, Shradha ka saundarya Annotation, Kavi Parichay, Summary

2. Poetry – Surdas – Two Padhya

Unit – III

1. Poetry – Subramaniya Bharathi – Nachenge – Hum Annotation, Kavi Parichay, Summary

2. Kaam Kaji Hindi Concept of Official Language and Hindi computing theory. Unit – IV

1. Poetry – Galiv – Chunin da ser – Annotation, Summary, Kavi Parichay

2. Computer Internet in Hindi Latest tools and Packages

Unit – V

1. Kavi parichay, Jaishan kar Prasad, Subramaniya Bharathi and Mirzagalib, Makhanlalchaturvedi

2. Slesha Alankar

(RADHA RAMAKROHNAN)

Syllabus for French

Semester II - French - II

Unit 1

Cultiver ses relations

 Recevoir, Communiquer, Parler des personnes, Donner des informations, écrire, être à l'aise avec les autres

Unit 2

Découvrir le passé

Parler du passé, raconter les moments d'une vie, parler de la famille, préciser le moment de la durée, parler des habitudes et des changements, connaître quelques repères de l'histoire

Unit3

Entreprendre

- Parler d'une entreprise, Exprimer un besoin, Parler du futur, Présenter les étapes d'une réalisation, Rapporter des paroles, Faire un projet de réalisation

Unit 4

Prendre des décisions

 Comparer des qualités, Comparer des quantités et des actions, Exprimer la ressemblance ou la différence, Faire des suppositions, Comparer des lieus, Parler de la télévision

Unit 5

Faire face aux problèmes

- Poser un problème, Caractériser une action, Parler de la sante, Interdire-Autoriser, Connaître la vie politique

Recommended book : Campus 1 – méthode de française by Jacky Girardet, Jacques Pécheur

8. MJ-5 M3-5 13/06/2017 (MANINEGALAI

1.G.R vers Maduravoyal, Chennai - 95 (An ISO 9001 : 2008 Certified Institution) Faculty of Humanities and science Department of English Syllabus for English 20/1 Semester II Paper II Common to All UG Courses (H&S) (i.e. B.B.A., B.C.A.(General), B.C.A.(Animation & Multimedia), B.Com. (General), B.Com. (A&F), B.Com. (C.S), B.Sc. (Comp. Sci.), B.Sc. (I.Sc.& Cyber Forensics), B.Sc.Comp.,(Science & Networking), B.Sc. (Electronics), B.Sc. (Media & Vis. Com.), B.Sc. (Bio.Tech), B.Sc. (Maths), B.Sc. (Physics), B.Sc. (Chemistry) etc) Proposed for implementation from the Academic Year 2017-2018 Code: HBEN14002 LTPC 3003 UNIT I Prose: Literary And bet of (Orient Black Swan) UNIT H Literary faelod ef(Orient Black Swan) Poetry: UNIT III Short Stories: Literary male die (Orient Black Swan) UNIT IV One Act Plays: Literary Melo Lig(Orient Black Swan) UNIT V R. P.m. bala Functional English

LTPC

3 0 0 3

ENGLISH – Paper II

SEMESTER II FROM THE ACADEMIC YEAR 2017-2018

COURSE OBJECTIVES:

1. to prepare students to attain a comprehensive knowledge of the communication skills

2. to make them understand the nuances of the English language and use the vocabulary in appropriate contexts

3. to develop in students a knowledge of the various techniques in language usage

4. to develop in them analytical and interpretative skills

5. to train learners in organized, academic and business writing

Unit I- PROSE- For Detailed Study

1. Spoon Feeding

2. Disaster Management

3. If You are Wrong Admit it

Unit II - POETRY- For Detailed Study

- 1. Psalm of Life
- 2. Anthem for Doomed Youth
- 3. Street Cries

Unit III - SHORT STORY

- 1. How Much Land does a Man Need?
- 2. Uncle Podger Hangs the Picture

Unit IV - DRAMA

- 1. Excerpts from The Merchant of Venice
- 2. Monkey's Paw

Unit V - FUNCTIONAL ENGLISH

Enhancing LSRW Skills through Tasks

Note: Each lesson to be followed by text-based Vocabulary, Grammar, and Usage Exercises

Rhuba

HEAD DEPARTMENT OF ENGLISH A EDUCY TO ME A RESEARCH INS UNIVERSITY Chennal - 600 095

W.R. Inge B.M. Hegde Dale Carnegie

H.W. Longfellow Wilfred Owen Sarojini Naidu

Leo Tolstoy Jerome K. Jerome

W.W. Jacob

William Shakespeare

Total:

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OBIECT		utona	F.FIOJE		euits											
•	To und	lerstan	d the conc	ept and	principl	e of	advance	d chemist	try and its	applicatio	on in va	rious fie	ld.			
COURS	E OUTC	OMES	(COs) : End	d of cou	rse stuc	dent	s will ab	le to								
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Subject Name : CHEMISTRY-II PBA2 Prerequisite: Chemistry L : Lecture T : Tutorial P : Project C: Credits OBJECTIVE : • To understand the concept and principle of advanced chemistry and its COURSE OUTCOMES (COS) : End of course students will able to Study of photochemistry and electrochemistry and phase r Understanding the concept of nomenclature and bonding of co-ordination chemistry and also know the polymer chemistry Gaining knowledge about air pollution and of basic of amini Gaining knowledge about air pollution and of basic of amini Mapping of Course Outcomes with Program Outcomes (POS) Iss PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 M M H M M M L M Sos PS01 PS02 PS03 </td><td>Code: Subject Name : CHEMISTRY-II BBA2 Prerequisite: Chemistry L : Lecture T : Tutorial P : Project C: Credits OBJECTIVE : • To understand the concept and principle of advanced chemistry and its application COURSE OUTCOMES (COS) : End of course students will able to Study of photochemistry and electrochemistry and phase 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PS01</td><td>Code: Subject Name : CHEMISTRY-II L T JBA2 Prerequisite: Chemistry 3 1 L: Lecture T: Tutorial P: Project C: Credits OBJECTIVE: -</td><td>Code: Subject Name : CHEMISTRY-II L T JBA2 Prerequisite: Chemistry 3 1 L : Lecture T : Tutorial P : Project C: Credits OBJECTIVE : - - • To understand the concept and principle of advanced chemistry and its application in various field. COURSE OUTCOMES (COs) : End of course students will able to - COURSE OUTCOMES (COs) : End of course students will able to - - - Course outcomes (COs) : End of course students will able to - - - Understanding the concept of nomenclature and bonding capacity and stability of molec co-ordination chemistry and also know the polymer chemistry - - Gaining knowledge about air pollution and of basic of aminoacids - - - Mapping of Course Outcomes with Program Outcomes (POs) - - - - Sos PSO1 PSO2 PSO3 - - - H H H H - - - - M M H H - - - - - M M H M M - - -</td><td>Code: Subject Name : CHEMISTRY-II L T P JBA2 Prerequisite: Chemistry 3 1 0 L: Lecture T: Tutorial P : Project C: Credits OBJECTIVE : 3 1 0 OBJECTIVE : • To understand the concept and principle of advanced chemistry and its application in various field. 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- • To understand the concept and principle of advanced chemistry and its application in various field. COURSE OUTCOMES (COs) : End of course students will able to - COURSE OUTCOMES (COs) : End of course students will able to - - - Course outcomes (COs) : End of course students will able to - - - Understanding the concept of nomenclature and bonding capacity and stability of molec co-ordination chemistry and also know the polymer chemistry - - Gaining knowledge about air pollution and of basic of aminoacids - - - Mapping of Course Outcomes with Program Outcomes (POs) - - - - Sos PSO1 PSO2 PSO3 - - - H H H H - - - - M M H H - - - - - M M H M M - - -</td> <td>Code: Subject Name : CHEMISTRY-II L T P JBA2 Prerequisite: Chemistry 3 1 0 L: Lecture T: Tutorial P : Project C: Credits OBJECTIVE : 3 1 0 OBJECTIVE : • To understand the concept and principle of advanced chemistry and its application in various field. 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COURSE OUTCOMES (COs) : End of course students will able to Study of photochemistry and electrochemistry and phase rules and its application Understanding the concept of nomenclature and bonding capacity and stability of molecules co-ordination chemistry and also know the polymer chemistry Gaining knowledge about air pollution and of basic of aminoacids Mapping of Course Outcomes with Program Outcomes (POs) M M M M M M M H M M L M H Image: construction of the	

HBCH19BA2	CHEMISTRY-II	LTPC	3 10 4

Unit – I

Photochemistry: laws in photochemistry, quantum yield, H₂-CI₂ reaction, Photosynthesis, phosphorescence, fluorescence, chemiluminescence and photosensitization.

Phase rule: Definition of terms in it. Water system, reduced phase rule and its application to simple eutectic system. Freezing mixtures.

Unit-II

Electrochemistry: Ionic equilibria, strong and weak electrolytes, acid-base, common ion effect, PH, buffer solution and buffer action, buffers in biological systems, salt hydrolysis.

Galvanic cells: EMF standard electrode potentials reference electrodes, electrochemical series and its applications. Cell reactions and calculation of EMF. Lead storage cell. Corrosion and its prevention.

Unit – III

Co-ordination chemistry: Nomenclature, Werner, Sidgwick and Pauling theories of metal – ligend bonding-stability - chelates applications of complexes in qualitative and volumetric analysesgeometrical isomerism of four coordinated complexes.

Principles of qualitative analysis and volumetric analysis: concept of solubility product common ion effect, its application in qualitative and volumetric analyses - principles of acid - base and redox titrations.

Unit – IV

Polymer Chemistry: types of polymerization - addition and condensation, thermosetting and thermoplastics – rubber, natural and synthetic fibers nylon – 6 and 66, polyesters, PE, PVC, Poylvinyl acetate.

Air pollution: pollution due to automobile fuels - green house effect - SO2 emission and acid rain depletion of ozone and its consequences. Environmental pollution by plastics.

Unit-V

Sulpha drugs: preparation and uses of sulphanilamide, sulphaguanidine and sulphathiozole. Source and uses of penicillin, chloromycetin and streptomycin (structural elucidation not needed).

Amino acids: Classification and sources of amino acids, preparation and properties of glycine, zwitterion structure, isoelectric point.

Total No of Periods: 60

References

- Text Book of Allied Chemistry by Dr. Veeraiyan
- Allied Chemistry I & II by Venkatashwarn, Vaidhyanathan and Ramaswamy

(12Hrs)

(12Hrs)

(12Hrs)

(12Hrs)

(12 Hrs)

Subject Code:	Su	bject Na	me : BIO	MOLE	CULAR	CHEN	IISTRY	7		L	т		Ρ	С
HBBT19B03	Pre	erequisit	e: Chemis	try						3	1		0	4
L : Lecture T : 1	Futorial	P : Proj	ect C: Cr	edits						II				
OBJECTIVE :														
 To dev 	elop un	derstand	ding and p	provide s	scientific	basics (of the lif	e proces	ses at th	e moleo	ular lev	el an	d	
explain	n the str	ucture,	function a	nd inter	-relatio	nships o	f Biomo	lecules.						
COURSE OUTC	COMES ((COS) : End of course students will able to												
CO1	U	Indersta	nd the stru	ucture, o	organiza	tion and	d classifi	cation of	t biomole	cules su	uch as			
	C	arbohyd	rates, pro	teins, lip	olds, vita	mins an	d miner	als.	·				<u> </u>	
CO2		their functions and role in life processes.												
		their functions and role in life processes.												
iviapping of Co	ourse O	utcomes	with Pro	gram Ol	itcomes	(PUS)								
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9					
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CO2	н	L	м	М	М	L	L	L	н					
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H/M/L indicat	os Stror	ogth of C	orrelation	<u>, н. н</u> і	ah M₋I	Modium								
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HBBT19B03 BIOMOLECULAR CHEMISTRY L T P C 3 10 4

UNIT - I:Carbohydrates

Structure and properties of mono, dioligo and polysaccharides, complex carbohydrates. storage polysaccharides: Starch and Glycogen; Structural polysaccharides: Cellulose and Chitin; A brief account of structure and function of mucopolysaccharides/ Glycosaminoglycans (Hyaluronic acid, Chondroitin sulphate), glycoproteins.

UNIT II : Amino acids and Proteins

Structure, classification and properties of amino acids; Peptide bond – nature and characteristics, Classification and organization of proteins: - primary, secondary, tertiary and quaternary structure of proteins

UNIT III: Lipids

Classification, structure, physical and chemical properties of fatty acids, Generalaccount of structure and function of triacylglycerols, phospholipids, glycolipids, sphingolipids, Cerebrosides lipoproteins and steroids.

UNIT IV : Nucleic acids

Nature of genetic material, structure of purine and pyrimidine, nucleotide. Composition of DNA and RNA-Watson crick model of DNA. Types of nucleic acid (DNA and RNA). Properties of nucleic acid.

UNIT V: Enzymes

Introduction and applications of secondary metabolites like Alkaloids, Flavonoids and terpenes(each any five)

Total No of Periods: 60

References:

- Lehninger Principles of Biochemistry. Michael M. Cox, 2008. Fifth Edition, W. H. Freeman • publishers.
- Principles of Biochemistry. Albert Lehninger, David L. Nelson, Voet Donald, Judith G.Voet and Charlotte W.Pratt., 2008. John Wiley and sons, Inc., New Jersey.
- Biochemistry, 5th edition. Jeremy M Berg, John L Tymoczko, and LubertStryer, 2002. W H Freeman publishers, New York.

(12hrs)

(12hrs)

(12hrs)

(12hrs)

(12hrs)

Subject Cod	ubject Code: Subject Name :Molecular Biology											Р	С		
HBBT19B04		Prerequi	isite: Bio	ochemis	try & Mi	crobiolo	gy			3	1	0	4		
L : Lecture T	: Tutor	ial P:Pr	roject C	: Credits	5					1					
OBJECTIV	Έ:														
• Tou	Inderst	and the n	nechanis	sm of rej	olication	, transcr	iption a	nd tran	slation. To	deeply	learn th	ne			
mol	ecules i	nvolved	in synthe	esis of D	NA, RNA	and pro	oteins.								
COURSE OU	TCOME	ES (COs) :	By doin	g this co	ourse stu	ıdents w	/ill								
CO1		Acquir	e basic f	undame	ntal kno	wledge	and expl	lore ski	ls in molec	ular bio	ology an	d beco	ome		
		aware	of the co	omplexit	y and ha	armony o	of the ce	ells.							
CO2		Empha	size the	molecul	ar mech	anism o	f DNA re	eplicatio	on, repair, t	ranscri	ption, a	nd pro	otein		
		synthesis and gene regulation in various organisms.													
Mapping of	g of Course Outcomes with Program Outcomes (POs)														
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COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9						
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CO2	Н	L	М	м	м	L									
COs /	PS	501	PS	02	PS	03									
PSOs															
				_		_									
CO1		Н	÷	4	ŀ	4									
CO2		н	ł	1	ŀ	1									
H/M/L indic	ates St	rength o	f Correla	ition H	- High, N	M- Medi	um, L-Lo	w		1					
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UNIT I: INTRODUCTION

DNA structure, RNA structure, organization of the bacterial chromosome, organization of eukaryotic chromosome, chromosome duplication and segregation, Mechanisms of DNA polymerase, types of DNA polymerases, replicon model, eukaryotic replication, role of telomeres and telomerase.

UNIT II: MUTATION, REPAIR AND RECOMBINATION

Replication errors and their repair, proofreading, mismatch repair, Mutagens, repair of DNA damage – photo reactivation, base excision repair, homologous recombination, Holliday model, transposition-transposase – replicative transposition, non-replicative transposition.

UNIT III: TRANSCRIPTION AND SPLICING

Types of RNA polymerases, Bacterial promoters, sigma factor, transcription mechanism in prokaryotes, rho dependent and independent termination, eukaryotic transcription, TATA element, TBP, RNA processing, RNA polymerase I and III promoter, mechanism of splicing in brief, inhibitors of transcription.

UNIT IV: TRANSLATION AND GENETIC CODE

mRNA, Open reading frame, Shine-Dalgarno sequence, 5', 3' modifications of eukaryotic mRNAs, role of tRNAs, tRNAcharging, tRNAsynthetases, structure of ribosome, mechanism of translation, eukaryotic translation factors, peptide bond formation, Degeneracy of the Genetic Code, Wobble base pairing, inhibitors of translation

UNIT V: GENE REGULATION

Prokaryotes – activators and repressors, Lac operon, trp, Eukaryotes – Homeodomain proteins, Zn containing DNA-binding domains, leucind zipper motifs, helix – loop helix proteins, DNAmethylation.

Total no of Hours: 45

TEXT BOOK

- Molecular Biology of the Gene, 5th Edition, Watson et al., Pearson Education.
- Molecular biology by David freifelder

REFERENCE BOOKS

- Molecular biology- Baltimore
- Molecular biology- Lodish

HBBT19B04

MOLECULAR BIOLOGY L T P C 3 1 0 4

9 Hrs

9 Hrs

9 Hrs

9 Hrs

9 Hrs

Subject	Subje	ect Nar	ne :BIO	CHEMIS	STRY L	AB				L	Т	Р	С
Code: HBBT19BL2	Prere	quisite	e: Chem	istry						0	0	3	1
L : Lecture T : T	utorial	P : Pi	roject	C: Credi	ts					•			•
OBJECTIVE	OBJECTIVE :												
To lear	n and u	unders	tand th	e princij	ples b	ehind th	e qualita	ative ar	nd quar	ititative	estimatio	n of	
COURSE OUTCOMES (COs) : Students will acquire knowledge about													
CO1	Basic	Bioche	emistry	qualitat									
CO2	Quali	tative	analysis	s of pro	teins a	and ami	no acids						
CO3	Quali	lualitative analysis of lipids and steroids											
Mapping of Co	Mapping of Course Outcomes with Program Outcomes (POs)												
COs/POs	PO1	PO2	PO	3 P	04	PO5	PO6	P07	PO8	PO9			
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01	п	141				п		L		141			
CO2	н	М	Н		Η	Н	н	L	Н	М			
CO2	н	М	Н		H	Н	н	L	Н	М			
COs / PSOs	P	501		PSO2		PS	03						
CO1		н		н		н							
CO2		н		н		1	Η						
CO2		н		Н			Η						
H/M/L indicate	es Strei	ngth o	f Correl	ation	H- Hig	;h, M- N	ledium,	L-Low		1			
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HBBT19BL2

BIO CHEMISTRY LAB L T P C 0 0 31

I. QUALITATIVE ANALYSIS CARBOHYDRATES

- 1. Analysis of Monosaccharides
- 2. Analysis of Disaccharides
- 3. Analysis of Polysaccharides

II. QUALITATIVE ANALYSIS PROTEINS & AMINOACIDS

- 1. Analysis of Egg Albumin
- 2. Analysis of Casein
- 3. Analysis of Peptone
- 4. Analysis of Gelatin

III. QUALITATIVE ANALYSIS LIPIDS

- 1. Test for Sterols
- 2. Test for lipids

TEXT BOOKS AND REFERENCES

- 1. Practical biochemistry byKeith Wilson and John walker 2005
- 2. An introduction to practical biochemistry Plummer, Tata-mcgraw Hill1987

SEMESTER III

Subject Code:	Subje	ct Name	:INSTRU	JMENT	ATION	METH	ODS AN	ID ANA	LYSIS	L	Т	Р	С	
HBBT19B05	Prere	quisite: E	lectronics	& Elect	rical					3	1	0	4	
L : Lecture T : T	utorial	P : Proje	ct C: Crea	dits										
OBJECTIVE:														
To impa	art adeq	uate kno	wledge of	f scientif	ic under	standing	g of the b	asic con	cepts in i	nstrum	entati	on use	d in	
Biotech	Biotechnology and also to impart a basic understanding about the biophysical phenomenon involved													
physiological systems.														
COURSE OUTCO	URSE OUTCOMES (COs) : At the end of this course the students would be able to													
CO1	Under	nderstand the skills in advanced methods of separation and analysis												
CO2	Acqui	quire practical experience in selected instrumental methods of analysis												
CO3	Devel	evelop skills of students in instrumentation and biological techniques and biophysical behavior of o molecules												
Mapping of Co	urse Ou	• Outcomes with Program Outcomes (POs)												
COs/POs	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9												
CO1	Μ	L	Н	Н	Н	L	L	L	н					
CO2	Μ	L	н	н	н	L	L	L	Н					
CO3	Μ	L	Н	Н	н	L	L	L	н					
COs / PSOs	PS	01	PSC)2	PS	03								
CO1	ł	1	н		ŀ	1								
CO2	I	4	Н		ŀ	1								
СОЗ	I	4	н		ŀ	1								
H/M/L indicate	s Stren	gth of Co	rrelation	H- Higl	n, M- Me	edium, L	-Low							
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	nces	вu	se II	Core		tive		ips / I Skil						
	Scie	eeri ces	initio ocia	am (am ves	Eleo	cal /	rnsh nica	kills					
	asic	ingin cien	Hums Ind S	rogr	rogr lecti	Jpen	racti roje	Inte Tech	oft s					
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HBBT19B05 INSTRUMENTATION METHODS AND ANALYSIS L T P C 3 1 0 4

UNIT I: SPECTROSCOPY - I & THERMAL METHODS

Introduction to principles and applications of spectroscopic methods - UV-Vis, IR, Fluorescence &Phosphorescence ORD, CD, DSC

UNIT II: SPECTROSCOPY - II & DIFFRACTION

Introduction to principles and applications of spectroscopic methods ESR, AAS, AFS, AES, Mass spectometry, NMR, XRD

UNIT III: MICROSCOPY – TECHNIQUES

Introduction to principles and applications of Microscopic methods Polarised light microscopy, phase constrast microscopy, interference microscopy, Fluorescence microscopy, confocal microscopy, electron microscopy - TEM, SEM

UNIT IV: CHROMATOGRAPHY & CENTRIFUGATION

Introduction to principles and applicationsChromatography - adsorption, affinity, partition - GLC, GC, HPLC, TLC, HPTLC, RPC.

UNIT V:ELECTROPHORETIC – TECHNIQUES

Introduction to principles and applications of Electrophoresis of proteins and nucleic acids -1D & 2D gels, SDS-PAGE, Agarose gel electrophoresis, Western Blotting, Gel documentation

Total no of Hours: 45

REFERENCES

- Principles of Instrumental Analysis, Skoog DA, Thomspon Brooks and Cole, 5th Edition
- Instrumental Methods of Chemical Analysis, Chatwal GR, Himalaya Publishing House
- Instrumental Methods of Chemical Analysis, Sharma BK, Krishna Prakashan Media Pvt Ltd
- Instrumental methods of analysis by Willard, Merit Dean & Settle, CBS Publishers and • Distributers, 6th Edition

9Hrs

9Hrs

9Hrs

9Hrs

9Hrs

Subject Code:	Subje	ct Name	:BIO STATI	STICS-						L	Т	Р	C
НВМА19ВАЗ	Prere	quisite: E	Basic maths							3	1	0	4
L : Lecture T : T	utorial	P : Proje	ct C: Credi	ts									<u> </u>
OBJECTIVE:													
The goa	al of bio	statistics	is to disent	angle t	he data:	received	d and ma	ke valid	inference	es that o	can be	used t	to
solve p	roblems	in publi	c health. Bio	ostatist	ics uses	the app	lication c	of statist	ical meth	ods to c	ondu	ct rese	arch
in the a	reas of	biology,	public healt	h, and	medicin	e.							
	OMES (C	:Os) : At	the end of t	his cou	irse the	students	s would b	be able t	0				
CO1	Gainir	ng knowl	edge about	the ba	sic conc	ept, imp	ortance,	scope a	nd limita	tions of	biosta	atistics	
CO2	Study	and und	erstand the	conce	pt of co	rrelation	and me	asures o	fcentral	tenden	су		
СО3	Unde	rstand th	e problems	based	on prob	abilities	and vari	ous dist	ribution o	concept	S.		
Mapping of Co	Mapping of Course Outcomes with Program Outcomes (POs)												
COs/POs	PO1	PO1 PO2 PO3 PO PO5 PO6 PO7 PO8 PO9 4											
CO1	Н	М	H	М	Н Н Н М М								
CO2	н	М	Н	М	н	н	н	М	м				
СОЗ	Н	м	Н	м	н	н	н	М	м				
COs / PSOs	PS	01	PSO2	2	PS	03							
CO1	ł	н	Н		ŀ	1							
CO2	I	Η	Н		ŀ	ł							
CO3	I	Η	Н		ŀ	ł							
H/M/L indicate	s Stren	gth of Co	rrelation	H- Higl	n, M- Me	edium, L	-Low						
	s			0)		S		_ ≡					
	ince	вu	es al	Core		ctive		i Ski					
	Scie	eeri ces	initi ocia ces	am	am ves	Eleo	t cal	rnsh nica	kills				
	asic	ngin Jeno	uma od S tiend	'ogr,	'ogr ectiv	pen	acti ojec	Intel echi	oft S				
	B	Er Sc	H ar Sc	Pr	P I	Ō	P P		Sc				4
				~									

BIO STATISTICS-I HBMA19BA3

UNIT I: INTRODUCTION TO STATISTICS

Statistics - Definition of Statistics - Importance and Scope of Statistics - Limitations of Statistics -Diagrammatic representation of Data - Bar diagrams - Pie diagrams - Histogram - Frequency polygon and Frequency valve - Pictogram.

LTPC

UNIT II: MEASURES OF CENTRAL TENDENCY

Mean - Median & Mode - Geometric mean & Harmonic Mean - Weighted Arithmetic Mean - Measures of dispersion - Range - Quartile Deviation - Mean Deviation - Standard Deviation - Coefficient of Variation.

UNIT III : CORRELATION

Concept of linear correlation between two variables - Scatter diagram - Karl person's formula for correlation coefficient - spearman's rank correlation - Calculation of correlation coefficient from ungrouped data (Simple problems).

UNIT IV: PROBABILITY

Definition of Random Experiment - Sample Space - Events: Mutually exclusive events - Exhaustive events -Dependent events and Independent events - Mathematical and Statistical definition of probability - Theorems of addition and multiplication laws of Probability (Without proof) - Conditional probability (Simple problems).

UNIT V: DISCRETE PROBABILITY DISTRIBUTIONS

Concept of probability mass function and probability density function: Binomial distribution - Poisson distribution - Mean and variance - Properties of these distributions (Without proof) (Simple problem)

Total no of Hours: 45

REFERENCE BOOKS:

- 1) Gupta S.C., Kapoor V.K., Fundamentals of Mathematical Statistics, S.Chand& Co., (2007).
- 2) Robert M. Leekley., Applied Statistics for Business and Economics, Taylor & Francis, S.Chand Publishing Co., (2015).
- 3) Arora P.N., Business Statistics, S.Chand& Co., (2007).
- 4) Sharma J.K., *Business Statistics*, Vikas Publishing., (2016).
- 5) Veerarajan T., Probability, Statistics and, Random Processes, Tata McGraw Hill Publishing Co., (2008).
- 6) Singaravelu, Probability and Random Processes, Meenakshi Agency, (2017).

31 0 4

9 Hrs

9 Hrs

9 Hrs

9 Hrs

9 Hrs

Subject Cod	e: Su	ubject N	lame : l	NZYMO	LOGY					L	Т	Р	С	
HBBT19B06	Pi	rerequis	ite: Nil							3	1	0	4	
L : Lecture T	: Tutor	ial P:	Project	C: Credi	ts									
OBJECTIVE :														
• To e	enable t	he stud	ents to l	earn enz	yme r	eaction	s an	nd its cha	aracteri	stics a	along w	ith the		
proc	duction	and pu	rificatior	n process	s: To k	now the	ind	dustrial	applicat	ions	of enzy	mes.		
COURSE OU	COURSE OUTCOMES (COs) : End of course students will able to													
CO1	Ur	ndersta	nd the ge	eneralpro	opertie	es and c	lass	sificatior	n of enz	ymes	and its	reaction	ons will	
	be	the key	y step in	to proce	ed tov	vards va	ario	us conce	epts in l	oioteo	chnolog	gy, the		
	th	theoretical aspects of kinetics will provide the importance and utility of enzyme												
	kiı	kinetics towards research.												
CO2	Th	The process of immobilization has been increased steadily in food, pharmaceutical and												
	ch	chemical industries and thus this study will provide simple and easy method of												
	implementation.													
CO3 Understanding of detoxification process and application of enzyme immobilization														
Mapping of Course Outcomes with Program Outcomes (POs)														
COs/POs	PO1	PO2	PO3	PO4	PO5	PO	6	P07	PO8	POS)			
CO1	н	1	м	м	м	1		1	1	н				
	••								-					
CO2	н	L	М	Μ	М	L		L	L	н				
COs /	PS	01	PS	02		PSO3								
PSOs														
CO1		H		4		н								
		-		-										
CO2	I	н	I	H		н								
H/M/L indic	ates St	rength	of Corre	ation	H- Hig	n, M- N	edi	ium, L-Lo	ow				1	
	ş			e		2								
	ence	ring es	ties cial	ы C	es -+ivu		· .	ips , cal	ills					
	Scie	nee	So	am ogra	ctiv	ctic 1	-	insh inh:	f Sk					
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				✓										
	1			1			1							
UNIT I: INTRODUCTION TO ENZYMES

Classification, nomenclature and general properties like effects of pH, substrate and temperature on enzyme catalysed reactions. Extraction, Isolation and purification of enzymes by precipitation, centrifugation, chromatography and electrophoresismethods.

UNIT II : ENZYME KINETICS (STEADY STATE) 9 HrsMichaelis-Menten Kinetics. determination of Km value and studying kinetics using Lineweaver Burke plot, Eadie-Hofstee and Hans Woofe equations - enzyme inhibitors.

UNIT III :ENZYME SPECIFICITY

Evidence for enzyme substrate complexes, Enzyme inhibition - competitive, Non competitive, Uncompetitive (Concepts with example); nucleophile and electrophile attack, role of metal ions in enzyme catalysis, mechanisms of enzyme action (lysozyme, chymotrypsin).

UNIT IV : ENZYME ACTIVATORS

Active site determination, regulation of enzymes, allosteric interactions and product inhibition coenzyme, isozymes and metallozymes, clinical and industrial applications of enzyme immobilization, enzyme engineering.

UNIT V : DETOXIFICATION

Phase I and Phase II enzymes, enzymes of detoxication. Carcinogenesis, characteristics of cancerous cells, agents promoting carcinogenesis; free radicals in biological system, antioxidants.

Total no of Hours : 45

REFERENCE

- Fundamentals of Enzymes, Treur Palmer, Prentice Hall Publications.
- Enzymes by Dixon and Webb Immobilized Enzymes, Messing 1988.

9 Hrs

9 Hrs

9 Hrs

9 Hrs

L T P C 3 1 0 4

Subject Cod	e: Su	ıbject N	lame :	HUMAN	PHYSIC	LOGY			L	Т	Р	C		
HBBT19B07	Pr	erequis	site: Nil						3	1	0	4		
L : Lecture T	: Tutor	ial P:	Project	C: Credi	ts			I						
OBJECTIVE :														
 It pr trea 	ovides tment o	a thoro of abno	ugh und rmal or d	erstandi disease s	ng of no tates. V	ormal bo Ve use i	ody functi nnovative	ion, ena e teachi	bling ı ng me	more ef thods to	fective o enhai	nce our		
	TCOME	S (COs)	: End o	of course	e studer	nts will a	able to							
CO1	Ga sys to	is excha stem. T obtain	nge bet hus, Unc oxygen a	ween tis lerstand and disch	sues and ing the onarge ca	d the bl circulato rbon di	ood is an ory and re oxide, wo	essentia espirato ork in tai	al fund ry syst ndem.	ction of tem, wh	the circ lose fur	culatory action is		
CO2	Ur nu sys	Inderstanding the importance of digestive system in breaking down food into utrients, which the body uses for energy, growth, and cell repair and excretory ystem for waste removal from the body Inderstanding the system of endocrine and nervous system.												
CO3	Ur	ndersta	nding the	e system	ofende	ocrine a	nd nervo	us syste	m.					
Mapping of	Course	rse Outcomes with Program Outcomes (POs)												
COs/POs	PO1	L PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9												
CO1	н	L	М	М	м	L	L	L	H					
CO2	н	L	м	м	м	L	L	L	Н					
COs / PSOs	PS	01	PS	02	Р	SO3		1						
CO1	ł	4		н		Η								
CO2	ł	1		н		H								
H/M/L indic	ates St	s Strength of Correlation H- High, M- Medium, L-Low												
	Basic Sciences	Engineering Sciences Humanities and Social Program Electives Open Electives Practical / Internships / Technical						Soft Skills						
				 Image: A start of the start of										

UNIT-I: RESPIRATORYSYSTEM

Components of transport of Oxygen and Carbon dioxide, Role hemoglobin in transport. Mechanism of respiration, Chloride shift, Bhor's effect.

HUMAN PHYSIOLOGY L T P C 3 1 0 4

UNIT-II: CIRCULATORY SYSTEM:

Introduction, function, types, of Circulatory organ. Design of Blood vessels, Blood Flow, blood pressure, Cardiac muscle, ischemic disease.

UNIT-III:DIGESTIVE SYSTEM

Components of Digestive system, Digestion, absorption of carbohydrates, protein, lipids. Mechanism of HCL formation, Role of various enzymes involved in digestive process

UNIT-IV:EXCRETORY SYSTEM9 Hrs

Structure and function of kidney, Mechanism of urine formation, Glomerular filtration rate (GFR).

UNIT-V: ENDOCRINE AND NERVOUS SYSTEM 9 Hrs

Brief outline of various endocrine glands and their secretion, physiological role of hormones. Nervous system - Brain, spinal cord, nerve cells, and nerve fibers. Synapse, chemical and electrical synapses, nerve impulses, action potential and neurotransmission.

Total no of Hours : 45

REFERENCE:

- Human physiology, 2nd edition- BJ Mejer, HS Meij, AC Meyer, AITBs publishers abd distributers.
- A Hand Book of Basic Human physiology- K. Saradhasubramanyam, S. Chand & Co., Ltd.
- Guide to physiology- Y. Rajakshmi, S. Chand & Co., Ltd.

HBBT19B07

9 Hrs

9 Hrs

Subject Cod	e:	Subject	Name : I	Recomb	inant DN	NA techr	nology			L	Т	Ρ	С
1100119000		Prerequ	isite: Bio	ochemis	try & Mi	crobiolo	gy			3	1	0	4
L : Lecture T	: Tutor	ial P:Pı	oject C	: Credits	5								
OBJECTIV	Έ:												
• To (unders	tand the	uses of	fenzym	nes in re	combin	ant tecl	hnolog	y. To learr	n abou	t cloning	g and	
exp	ressio	n vectors	s and its	s role in	various	biologi	cal proc	cesses	·				
COURSEOU		=S (COS) :	By doin	g this co	ourse stu	idents w	/111						
CO1		Acquir	e basic f	undame	ntal kno	wledge i	in recom	nbinant	DNA techn	ology a	nd cDN	A libra	ary
		constru	uction										
CO2		To kno	w about	the vari	ous vect	tors and	techniq	ues use	d in recom	binant	technolo	ogy ar	nd its
		applica	ition in c	liverse p	latform								
Mapping of	Course	Outcom	es with	Program	n Outcor	nes (PO	s)						
COs/POs	PO1	L PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9											
CO1	н	L M M M L L L											
CO2	Н	L	М	М	М	L	L	L	н				
COs /	P	SO1	PS	02	PS	03							
PSOs													
CO1		Н	ŀ	1	ŀ	4							
CO2		н	ŀ	1	ŀ	1							
H/M/L indic	ates St	rength o	f Correla	ition H	- High, N	M- Medi	um, L-Lo	w			1		
	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships /	Soft Skills				

HBBT19B08 RECOMBINANT DNA TECHNOLOGY L T P C 3 1 0 4

UNIT I: ENZYMES IN RECOMBINANT DNA TECHNOLOGY

Restriction Endonucleases, Cohesive and blunt end ligation, linkers and adaptors, homopolymer tailing, double digestion, Klenow enzyme, T4 DNA polymerase, Polynucleotide kinase, alkaline phosphatase, Hybridization techniques: Southern, Northern and colony hybridization.

UNIT II: PROPERTIES OF CLONING VECTORS

Plasmid vectors : PBR 322 and PUC19, Bacteriophage vectors : Insertion and replacement vectors, Cosmids, Expression vectors, Methods for introducing DNA into cells, Transformation, Selection of recombinants, alpha complementation, replica plating.

UNIT III: YAC AND BAC VECTORS

Construction of Genomic and cDNA Libraries, partial digests, synthesis of cDNA from mRNA, Choice of vectors, characterization of plasmid clones.

UNIT IV: PRINCIPLES OF DNA SEQUENCING

Sanger's method, Maxam and Gilbert method. Automated DNA sequencing, PCR, Types of PCR: multiplex, RT-PCR, nested, touch-down, Applications of PCR, Principle of SiRNA technology.

UNIT V: RECOMBINANT PROTEIN EXPRESSION

Insulin, Human Growth Hormone, Hepaptitis B viral vaccine, Use of Fusion Proteins to aid in **Recombinant Protein Purification.**

Total no of Hours : 45

REFERENCES:

- Principles of Gene Manipulation. S.B. Primrose, R.M. Twyman and R.W.Old; 6th Edition, S.B.University Press, 2001.
- Gene Cloning by T.A Brown.
- From Genes to Genomes- Concepts and Applications of DNA Technology Dale JW and von Schantz M
- Recombinant DNA, Third Edition, Watson, Caudy, Myers, Witowski.

9 Hrs

9 Hrs

9 Hrs

9 Hrs

HBMG17L01



LTPC

1 0 3 2

LTPC

0 1 1 2

FACULTY OF HUMANITIES AND SCIENCE DEPARTMENT OF ENGLISH CAREER AND CONFIDENCE BUILDING SYLLABUS (2017-2018)

HBMG14L01

20/

CURRICULUM SOFT SKILL-I

Common to All UG Courses (H&S) (50 + 50)(i.e. B.B.A., B.C.A.(General), B.C.A.(Animation & Multimedia), B.Com. (General), B.Com. (A&F), B.Com. (C.S), B.Sc. (Comp. Sci.), B.Sc. (I.Sc.& Cyber Forensics), B.Sc.Comp.,(Science & Networking), B.Sc. (Electronics), B.Sc. (Media & Vis. Com.), B.Sc. (Bio.Tech), B.Sc. (Maths), B.Sc. (Physics), B.Sc. (Chemistry) etc)

COURSE OBJECTIVES:

1. to diagnose the strength and weakness of the student in Functional English

SOFT SKILLS-I

- 2. to develop the functional grammar
- 3. to prepare them to use Functional English through LSRW 4. to make them learn through practice and activity
- 5. to use English Language as a life skill

Prelude

Diagnostic Test- Articles, Forms of 'be' verbs, Tense, Preposition, Gerunds & Infinitives, Reported Speech, Active & Passive Voice, Letter Writing

Unit I

6 hours

Job and career- three types- Govt.,pvt and public sector-Bank, govt.offices, navy, defense, govt.institutions-IT and, BPo and corporate-semi govt like ISRO etc- requirements- advt- skills needed (download the details) Delivery

Audio and video cassettes

Unit II

6 hours

Technical skill- Communication skill especially in English- strengthening communicative English-Listening, Reading, speaking and writing- Listening- sounds of vowels and consonants and writing them-functional English -difference between functional and theoretical English

HEAD, DEPARTMENT OF ENGLISH R EDUCAT COHINSTITUT

Unit III

Listening and writing

Activity based exercises on articles, modals, prepositions and infinitives The above topics are chosen as we don't find equivalents' in L1

Unit IV

Reading and writing

Vocabulary-synonm, antonym, collocations, confused words, homonym, odd man out, words with correct spelling, avoid redundancy –Inferential comprehension (basede on BEC and Blog on Soft Skills BY me)-browsing, skimming and scanning note- making

Unit V

Speaking

Introducing yourself (giving questions)- collecting information in pairs and presenting it for 2 minutes – story telling through picture- interpretation of psychometric pictures through question and answer – PPT preparation and presentation-developing the story in pairs as game

Total:

Text Book , Reference Books and Web Resources:

- 1. Soft Skill for Everyone-Jeff Butterfield, Part-1; Unit-D&E
- 2. EFA (English For All)- Dr. Padmasanni Kannan, Libin Roy Thomas
- 3. English for Competitive Exam- R.P. Bhatnagar, Rajul Bhargava
- 4. Soft Skill Blog
- 5. Jobsearch.about.com
- 6. www.exsearch.in/interview.html

COURSE LEARNING OUTCOME:

Students completing the course Soft Skill-I will be able to

- 1. know their weakness in the use of English Language.
- 2. understand the functionality of the language in simple context.
- 3. improve their communication skill through LSRW.
- 4. improve the functional grammar through practice and activity.
- 5. understand the necessity of English Language.

HEAD, DEPARTMENT OF EN T GR EDUCAT SEARCHT DEPART SEARCHT Chemical 600 005

6 hours

6 hours

30 Periods

6 hours

Subject Code	: Sub	oject Na	me : INS	STRUMI AB	ENTATI	ON ME	THODS	AND ANA	LYSIS	L	Т	Р	C
	, Pre	requisit	e: Bioch	emistry	' Lab					0	0	3	1
L : Lecture T :	Tutoria	I P:Pi	oject C	: Credit	S								
OBJECTIVE	:												
 To ur 	ndersta	and the	standa	rd oper	ating p	proced	ures of	various	instrum	ents. To	anal	yze tł	ne
differ	ent bio	molec	ules pre	sent in	the bio	ologica	l syste	m using	the ana	lytical te	echnic	ques.	
COURSE OUT	COMES	(COs) :	To train	the stu	udents								
CO1	To	have a l	oractical	hands o	on expe	erience	on Abs	orption Sp	pectrosc	opic met	thods		
CO2	To	acquire	experier	nce in tl	ne purif	fication	by per	forming c	hromato	ography			
СО3	То	validate	e and ana	alysis us	ing var	ious me	ethods	and techn	iques				
Mapping of C	ourse C	Dutcom	es with I	Program	n Outco	omes (F	POs)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9				
CO1	н	м	Н	н	М								
CO2	н	м	Н	н	М								
							_						
CO3	н	м	н	н	н	н	L	H	M				
COs / PSOs	PS	01	PSC	02	PS	03							
CO1	I	1	Н	l	ŀ	1							
CO2	I	1	Н		ŀ	1							
СОЗ	I	4	н		ł	4							
H/M/L indica	tes Stre	ength o	f Correla	tion H	l- High,	, M- Me	edium,	L-Low					
		Š											
		ences											
>	ces	g Scie g Scie s and ore ore Proje skill											
egor	Scien	eering niities am Co am Co am Ele cal / P cal / P ships											
Cat	Basic 9	Engine	Huma Social	Progra	Progra	Open	Practio	Intern Techn	Soft Sl				
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HBBT19BL3 INSTRUMENTATION METHODS AND ANALYSIS LAB L T P C 0 0 3 1

- 1. Estimation of amino acids by formal titration.
- 2. Estimation of ascorbic acid by titrimertic method using 2, 6-dichlorophenol indophenol.
- 3. Determination of saponification value of edible oil.
- 4. Determination of Acid number of edible oil.
- 5. Iodine value of oil.
- 6. Estimation of Protein by Biuret method
- 7. Estimation of amino acids by ninhydrin method
- 8. Paper chromatographic separation
- 9. Chromatographic separation
- 10. Thin layer chromatography.

REFERENCE BOOK:

- Practical biochemistry by Varley
- Practical biochemistry by Keith Wilson and John walker 2005
- An introduction to Practical biochemistry Plummer, Tata-mcgraw Hill1987

Subject Code:	Subje	ct Name	:BIO STATI	STICS-I	I					L	Т	Р	С
HBMA19BA4	Preree	quisite: E	BASIC MATH	łS						3	1	0	4
L : Lecture T : Tu	utorial	P : Proje	ct C: Credi	ts									
OBJECTIVE:													
 The goal 	al of bios	statistics	is to disent	angle t	he data	received	d and ma	ke valid	inference	es that o	can be	used t	:0
solve pr	roblems	in publi	c health. Bio	ostatist	ics uses	the appl	lication c	of statist	ical meth	ods to c	condu	ct rese	arch
in the a	reas of	biology,	public healt	h, and	medicin	e.							
	OMES (C	: Os) : At	the end of t	this cou	irse the	students	s would k	pe able t	0				
CO1	Under mainl	rstand th y on nori	ie problems mal distribu	based ition	on prob	abilities	and vari	ous con	tinuous d	istribut	ion co	ncepts	
CO2	Gainir and te	ng the kn esting the	owledge of hypothesi	[:] design s and it	ing the o	experim cance	ents by c	one way	and two	way AN	OVA n	nethoc	ls
СОЗ	Under	rstanding	g the index	numbe	r and tin	ne series	s concep	t in bios	tatistics				
Mapping of Cou	urse Out	tcomes v	with Progra	m Outo	comes (F	POs)							
COs/POs	PO1	PO2	PO3										
CO1	Н	М	Н	М									
CO2	Н	М	Н	М	Н	Н	н	М	М				
CO3	Н	М	Н	М	Н	Н	н	М	М				
COs / PSOs	PS	01	PSO	2	PS	03							
CO1	ł	4	Н		I	Н							
CO2	ł	4	н		I	Н							
СО3	ł	4	Н		I	Н							
H/M/L indicate	s Stren	gth of Co	rrelation	H- High	n, M- Me	edium, L	-Low			1			1
	SS			e		es		dill					
	ence	ing	ies al	S									
	C Sci	neer	anit Soci Ices	Skill									
	Basic	Engii Scier	Hum and Scier	Prog	Prog Elect	Opei	Prac' Proj€	Int. Tecl	Soft				
				 ✓ 		_							+

HBMA19BA4 BIO STATISTICS-II L T P C 3 1 0 4

UNIT I :CONTINUOUS PROBABILITY DISTRIBUTIONS 9 HrsNormal distribution - Mean and variance - Properties of Normal distribution (Without proof) (Simple problems).

UNIT II: TESTING OF HYPOTHESIS 9 HrsTests of Significance – Large Sample Tests – Mean – Proportions – Small Sample Tests – t, F, Chi-square Tests: Independence of Attributes, Goodness of Fit.

UNIT III: DESIGN OF EXPERIMENTS 9 HrsAnalysis of Variance: One Way & Two-Way Classification – Design of Experiments – Randomized Block Design – Completely Randomized Block Design – Latin Square Design.

UNIT IV: INDEX NUMBER9 Hrs

Definition - Limitations and uses of Index numbers - Construction of index number by aggregate expenditure method and family budget method using Laspeyre's - Paasche's and Fisher's Formula.

UNIT V: TIME SERIES9Hrs

Meaning of Time series - Various components of Time series: Trend, Seasonal, Cyclic and Random components - Methods of measuring Trend by (a) Graphical method (b) Moving average method. (Simple problems).

Total no of Hours: 45

REFERENCE BOOKS:

- 1) Gupta S.C., Kapoor V.K., Fundamentals of Mathematical Statistics, S.Chand& Co., (2007).
- 2) Robert M. Leekley., *Applied Statistics for Business and Economics*, Taylor & Francis, S.Chand Publishing Co., (2015).
- 3) Arora P.N., Business Statistics, S.Chand& Co., (2007).
- 4) Sharma J.K., *Business Statistics*, Vikas Publishing., (2016).
- 5) Veerarajan T., *Probability, Statistics and, Random Processes*, Tata McGraw Hill Publishing Co., (2008).
- 6) Singaravelu, Probability and Random Processes, Meenakshi Agency, (2017).

Subject Cod	e:	Subject	Name :	INTERM	EDIARY	METABO	DLISM-I			L	Т	Ρ	С	
1100119009	-	Prerequi	isite: Bio	ochemis	try & Mi	crobiolo	gy			3	1	0	4	
L : Lecture T	: Tutor	ial P:Pr	roject C	: Credits	5					I				
OBJECTIV	'E:													
• To d	lescribe	e, in quan	titative	terms, tl	ne chem	ical char	nges cata	alyzed b	by the com	ponent	enzyme	es of t	he	
rout	e; and	to descril	be the va	arious in	tracellul	lar contr	ols that	govern	the rate at	which	the pat	hway		
func	ctions.		<u> </u>				•••							
COURSEOU	TCOME	:S (COs) :	By doin	g this co	ourse stu	idents v	VIII							
CO1		Unders	standing	the bas	ic conce	pt of cel	l structu	re and i	ts energeti	ics. Anc	l also ga	ining		
		knowle	edge of f	unctions	s of cell o	organell	es and it	s role ir	n photosyn	thesis.				
CO2		Study t	he meta	bolism d	of carbol	hydrates	and lipi	ids and	gaining inf	ormatio	on abou	t		
		metab	olism pa	thways	and bios	ynthesis	of mole	ecules						
Mapping of	Course	Outcom	es with	Program	n Outcor	nes (PO	s)							
			PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9											
COs/POs	PO1	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 I M M I I H H I I H												
CO1	н	L	M M L L L H											
CO2	н	L	М	м	М	L	L	L	н					
COs /	PS	501	PS	02	PS	03								
PSOs														
CO1		н	ł	ł	ŀ	1								
CO2		н	ŀ	1	ŀ	4								
H/M/L indic	ates St	rength o	f Correla	ition H	- High, N	M- Medi	ium, L-Lo	w						
			es											
		ces	ocial Scienc											
	3asic Sciences	Engineering Scienc	Humanities and So	^o rogram Core	Program Electives	Dpen Electives	Practical / Project	nternships /	soft Skills					
				 										

HBBT19B09 INTERMEDIARY METABOLISM-I LTPC 3 10 4

UNIT I: BASIC CONCEPTS AND DESIGN

Different types of energy. Oxidation of carbon fuels. Structure of mitochondria, the mitochondrial respiratory chain, order and organization of electron carriers, proton gradient, iron sulphur proteins, cytochromes and their characterization,

UNIT II: BIOENERGETICS

Sequence of electron carriers, sites of ATP production, ATP synthetase.Electron transport chain and oxidative phosphorylation and its regulation. Inhibitors and Uncouplers of ETC.

9 Hrs

UNIT III: PHOTOSYNTHESIS9 Hrs

Structure of organelles involved in photosynthesis in plants, proton gradients and electron transfer in chloroplasts of plants differences from mitochondria, light receptors: chlorophyll, light harvesting complexes, photosystems I and II, their location, mechanism of quantum capture and energy transfer between photo systems, ferrdoxin, plastocyanin, plastoquinone and carotenoids, the Hill reaction, photophosphorylation, reduction of CO2, light and dark reactions, light activation of enzymes, regulation of photosynthesis.

UNIT IV: CARBOHYDRATE METABOLISM

Uptake of carbohydrate in animals for catabolism, reactions, energetic and regulation of glycolysis, TCA cycle, its function in energy generation, reactions. Glucogenesis, glycogenolysis, Cori cycle, glyoxate cycle, Glyconeogenesis, and physiological significance of pentose phosphate pathway.

UNIT V: LIPID METABOLISM 9 Hrs

Uptake of lipids in animals, transport and hydrolysis of triglycerides, transport of fatty acids into mitochondria, Fatty acid oxidation: β-oxidation of saturated and unsaturated fatty acids ,Ketone bodies formation and utilization, biosynthesis of fatty acids: saturated and Un saturated fatty acids, biosynthesis and degradation of cholesterol.

Total no of Hours: 45

REFERENCES

- Voet&Voet,(1995) Biochemistry: (2nd Ed) John Wiley and Sons.
- Stryer, L (1992) Biochemistry (4 thEd.) W.H. Freeman & Co, NY.
- Harpers (2003) Biochemistry: (26th Ed.) Lange

9 Hrs

Subject Code	: S	ubject Na	ame :IMN	IUNOLO	DGY					L	Т	Р	C
HERITARIO	Р	rerequisi	te: Bioche	emistry	& Micro	biology	1			3	1	0	4
L : Lecture T :	Tutori	al P:Pro	oject C:	Credits									<u> </u>
OBJECTIVE													
• To un	dersta	ind the ro	ole of imm	nune sys	stem, to	gain kr	nowledg	ge on dif	ferent ly	mphoic	d organs	and typ	es of
immu	inity ai	nd immur	ne respon	ises pro	duced.	To acqu	ire knov	wledge o	on devel	opment	t, matura	ation,	
		S (COs) :	At the en	d of stu	is and B	this cou	rse stud	lents wo	ould be a	able to			
CO1		Acquire b	basic fund	amenta	il knowl	edge in	the imr	nune sys	stem				
CO2		Know ab	out the d	ifferent	types c	of lymph	noid org	ans and	its funct	ions			
CO3		Understa	and the p	atholo	gical e	/ents d	ue to w	rong im	mune r	espons	ses		
Mapping of C	ourse	Outcome	es with Pr	ogram	Outcom	nes (POs	5)						
COs/POs	PO1	1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9											
CO1	н	L	м	Μ	М	L	L	L	Н				
CO2	н	L	м	М	М	L	L	L	Н				
CO3	н	L	м	М	М	L	L	L	Н				
COs / PSOs	PSO	1	PSO2		PSO3	I		I					
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CO2		н	н		ŀ	1							
CO3		н	н		ŀ	1							
H/M/L indica	tes Str	rength of	Correlati	on H-	High, N	1- Medi	um, L-L	ow					
		ces ces											
	S	cien	s pu		tives	s	oject	'Tec					
	ence	ing S	ies a	Core	Elec	ctive	/ Pro	nips / Ski	(0				
	c Scie	neer	aniti	ram	ram	ו Ele	tical	ernsh	Skills				
	Basic	Engi	Hum Scier	Prog	Prog	Opei	Prac	Inté	Soft				
				~									

UNIT I: INTRODUCTION

Components of innate and acquired immunity; Organs and cells of the immune system - primary and secondary lymphoid organs; antigens: chemical and molecular nature; haptens; adjuvants; types of immune responses; theory of clonal selection.

UNIT II: CELLULAR RESPONSES

Development, maturation, activation and differentiation of T-cells and B-cells; T-Cell receptors; Functional T-cell subsets; Immunoglobulins: basic structure, classes, and functions; Generation of antibody diversity; Antigen processing and presentation: Monoclonal antibodies: Principle and Applications

UNIT III: INFECTION AND IMMUNITY 9 Hrs

Injury and inflammation; Immune responses to infections: Immune response to infectious agents: Viruses, bacteria, fungi and parasites; Cytokines secreted by Th1 and Th2 subsets; Complement; Immunosuppression, tolerance, Immune dysfunction and its consequence: Allergy and Asthma

UNIT IV: IMMUNE DISORDERS AND IMMUNIZATION METHODS9 Hrs

Hypersensitivity (Type I to IV); AIDS and Immunodeficiencies; Immunisation; Vaccines and types: Common vaccines for humans

UNIT V: TRANSPLANTATION, TUMOR IMMUNOLOGY & AUTO IMMUNITY9 Hrs

Transplantation: Different types of transplants; Mechanism of graft rejection; Tumor immunology : Tumor antigens, Immune response to tumors and tumor evasion; Autoimmunity, Autoimmune disorders and diagnosis

Total no of Hours: 45

REFERENCES:

- Roitt's Essential Immunology, 12th Edition, Wiley-Blackwell., 2011.
- Kuby J, Immunology, 5th edition, WH Freeman & Co., New York., 2003.
- Janeway CA, Travers P, Walport M, and Shlomchik M. Immunobiology, 6th edition, Garland Science., 2001.
- Animated pictures & Videos : <u>www.roitt.com</u>

HBBT19B10 IMMUNOLOGY

9 Hrs

L T P C 31 0 4

Subject Code:	Sub	oject Nai	me : MICI	ROBIOLO	DGY			L		т		Р	C
HBBT19B11	Pre	requisite	e: Nil					3		1		0	4
L : Lecture T : T	utorial	P : Proje	ct C: Cre	dits									1
OBJECTIVE													
• To und	erstand	the basio	structur	e of mic	roorgan	ism such	as bact	eria, vir	uses,	algae	fung	gi and ph	age.
Io have	e a brief	knowled	lge about	the nut	rition re	quireme	ents and	growth	curve	e of ba	acter	ia and al	SO
			usmetric				Jes.						
	OMES (C	Os) : End	d of cours	e stude	nts will	able to							
CO1		• Ui	nderstand	the pri	nciples o	of Micro	biology	with res	pect	to var	ious	types of	
		m	icrobes										
CO2		• Ui	nderstand	the ba	sic struc	ture and	biochei	mical as	pects	of va	rious	microbe	es
		w	ill be acqu	uired									
03		• SC in	lve the p	roblems	s in micro	obial infe	ection a	nd their	conti	rol and	dits	applicati	on
Mapping of Co	urse Out	tcomes v	vith Prog	s. ram Out	tcomes	(POs)							
								r					
COs/POs	PO1	PO2	PO3	PO7	PO8	РО	9						
CO1	н	L	М	М	М	L	L	L	н				
CO2	н	L	М	М	Μ	L	L	L	Н				
CO3	н	L	М	М	Μ	L	L	L	Н				
COs / PSOs	PS	01	PSC)2	PS	03							
CO1	ŀ	ł	Н		ł	Η							
CO2	ŀ	1	Н		I	Η							
CO3	ŀ	1	Н		I	Η							
CO4	ŀ	1	Н		I	Η							
H/M/L indicate	es Streng	gth of Co	rrelation	H- Hig	gh, M- N	1edium,	L-Low		•				
			pt s:		ives	s	ject	s /	Į.				
	lces	ള	es ar	ore	llect	tive	Pro	hip:	cal S				
	cier	erir es	nitie Scie	L L L	ш Ш	lec	al /	erns					
	sic S	gine enci	mar cial	ogra	en [ictic	l lnt						
	Bat	En _é Sci	Hu Soc	Prc	Prc	Оp	Pra		400				
				~									

HBBT19B11 MICROBIOLOGY L T P C 3104

UNIT I: HISTORY OF MICROBIOLOGY 9 Hrs Germ theory of disease – Pasteur's contribution and Koch's contribution, Classification-systemic and numerical classification.Staining techniques –Simple staining, Gram staining, acid fast and capsule staining,Structure andmorphology of prokaryotic cell.

UNIT II: NUTRITIONAL REQUIREMENTS OF BACTERIA AND DIFFERENT MEDIA USED FOR BACTERIAL CULTURE9 Hrs

Bacterial Growth – Bacterial growth curve, factors effecting bacteria growth - different modes of antibiotic action; aerobic and anaerobic bioenergetics and utilization of energy for biosynthesis of important molecules

UNIT III: FUNGI - CLASSIFICATION OF FUNGI

Prevention of fungal growth-antifungal and sterilization, Study of Yeasts – morphology and reproduction of yeasts, and industrial application, Fungal enzymes of commercial importance and production of mammalian proteins from fungi.

UNIT IV: VIRUS, CLASSIFICATION OF VIRUSES ON THE BASIS OF CAPSID 9 Hrs

Virus - Structure of virus, Classification of viruses on the basis of capsid symmetry enveloped (Herpes virus), helical (TMV) and icosahedral (Polyoma viruses), lytic and lysogenic Cycles of bacteriphages, principle of plaque assay; Physical and chemical control of microorganisms; host-microbe interactions; anti-bacterial, anti-fungal and anti-viral agents, mode of action and resistance to antibiotics; clinically important microorganisms

UNIT V: INDUSTRIAL PROCESS OF BEVERAGES 9 Hrs

Industrial process of beverages - enzymes - amino acid - organic acids - organic solvents - antibiotics.

Total no of Hours: 45

9 Hrs

REFERENCES:

- Michael J. Pelezar, J.R.E.C.S Chan, Noel R. Erieg,2005, "Microbiology " TATA McGraw Hill, 5thEdition
- Anantha Narayan, C.K. JayaramPaniker, 2009, "Text Book of Microbiology" Orient Blackswan, 7th. Edition
- Joanne Willey, 2010. Prescott.s Microbiology, eighth edition, McGrawHill, Newyork.

HBMG17L02 SOFT SKILLS-II

L T P C 0 0 3 2

Educational and Research Institute University Maduravoyal, Chennai - 95 (An ISO 9001 : 2008 Certified Institution) FACULTY OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF ENGLISH QUALITATIVE AND QUANTITATIVE SKILLS SYLLABUS - 2017 - 2018 HBMG14L02 L T P C 0 1 1 2 CURRICULUM SOFT SKILL-II COURSES: B.Tech (50+50)COURSE OBJECTIVES: 1. to strengthen the students with the needed vocabulary 2. to infer information from the given passage through reasoning 3. to train them in attending Group Discussion 4. to face the Technical and HR interview of the corporate 5. to raise communication proficiency to global standards HBMG14L02 LTPC 0112 Unit 1 6 hours Preparation of resume-functional resume with objective according to different advts.-how to have interview file-how to send it by email-concept of writing email-practice through BEC method(questions and answer) Unit 2 6 hours Writing secretarial letters like intra-mail and inter-mail, agenda, memo and business reportsintroducing GD through video-conduct of GD on a topic and also case studies Unit 3 6 hours Body language-grooming -Interview skill- Do's and Don'ts- mock interview -exchange of interviewer and interviewee practical session Unit 4 6 hours

Number system – H.C.F & L.C.M – Problem on ages – Percentage – Profit & Loss – Ratio & Proportion – Partnership.

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Subject Code	e: Su	bject N	ame :MI	CROBIC	DLOGY	LAB				L	Т		Р	С
HBBT19BL5	Pre	erequisi	te: Nil							0	0)	3	2
L : Lecture T :	Tutori	al P:P	roject (C: Credi	ts									I
OBJECTIVE • To te	Ξ : ach the	e basic d	concept i	nvolved	d in the	steriliz	ation, is	solation	and cu	ltivatio	on, id	lentif	ication	of
	bes	MEQ	(0, 1)	N4 4ha	and of	atudu	ing the							
	0100					Study								
CO1	•	The s hand	tudents v le the mi	will knc croorga	w abou anisms	it good	laborat	tory pra	ctice, th	nis will	help	ther	n to	
CO2	٠	They	will fami n in pure	liar wit culture	h cultur e.	al and	morpho	ological	charact	eristic	s of n	nicro	organi	sms
CO3	٠	They demo	will unde	erstand the exp	the pra erimen	actical k t, their	nowlec applica	dge of va tions an	arious k d inter	pioche pret th	mical ne res	phe sults.	nomen	a by
Mapping of C	Course	Outcon	nes with	Progra	m Outc	omes (POs)							
COs/POs	PO1	D1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9												
CO1	Н	Μ	Н	Н	М									
CO2	н	М	н	Н	н	Н	L	Н	М					
CO3	Н	Μ	Н	Н	Н	Н	L	Н	М					
COs / PSOs	PS	01	PSC	02	PS	03								
CO1	ł	4	н		ł	4								
CO2	ł	4	н		ł	ł								
CO3	ł	4	н		ł	ł								
H/M/L indica	ates Str	es Strength of Correlation H- High, M- Medium, L-Lov						L-Low		1				
	Basic Sciences	Basic Sciences Engineering Sciences Humanities and Social Sciences Program Core			Program Electives	Open Electives	Practical / Proiect	Internships / Technical Skill	Soft Skills					
							~							

HBBT19BL5 MICROBIOLOGY LAB L T P C 0 0 3 2

- 1. Sterilization techniques-Autoclave, Hot air oven, Filter sterilization (lecture/demonstrations).
- 2. Preparation of culture media (a) broth (b) Agar.
- 3. Culturing of Microorganisms: Pure culture techniques: Streak plate, pour plate, spread plate method
- 4. Differential media and selective media of bacteria.
- 5. Enumeration of micro-organisms- Serial dilution plating
- 6. Identification of microorganisms. (a) Staining techniques Simple staining, Gram staining, Capsule staining, Endospore staining
- 7. Motility of bacteria by Hanging drop method.

TEXT BOOKS

1. Monica Chessbrough(1999) *Laboratory Manual in Microbiology(Vol I & II)*Cambridge University Press

REFERENCE BOOKS

1. Cappucino (1999) Microbiology - A laboratory Manual Benjamin Cummings

Subject Code:	Sul	oject Na	me : Imn	nunolog	y Lab					L	Т	Р	С
HBB119BL4	Pre	erequisite	e: Bioche	emistry	Lab & M	icrobiol	ogy Lab			0	0	3	2
L : Lecture T : T	utorial	P : Proje	ect C: Cr	edits									
OBJECTIVE:													
• To ena	ble the	students	to unde	rstand t	he speci	ficities c	of antibo	dies and	mecha	inism (of antik	ody div	ersity.
		$\frac{1}{2}$	ning in di	riterent i	mmuno	logical a	na imm	une tecn	nologic	al teci	nnique	S.	
		COS) : En	iu or the	course,									
CO1	The	e student	ts would	be awaı	re of imr	nune sy	stem cel	ls and tis	sues				
CO2	The	e student	ts would	have kn	owledge	e on imn	nunologi	ical /clini	cal test	ts			
CO3	The	e student	ts would	be able	to isolat	e lymph	ocytes a	and mon	ocytes				
Manning of Co		itcomes	with Pro	gram O	utcomes								
		itcomes	with FIO	grain O		5 (FO3)	r						
COs/POs	PO1	L PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO											
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CO2	Н	м	н	н	Н	Н	L	н	М				
CO3	Н	м	н	н	Н	Н	L	н	Μ				
COs / PSOs	PS	01	PSO	02	PS	03							
CO1	I	Н	н		ŀ	1							
CO2	I	н	н		ŀ	1							
CO3	I	н	н		ŀ	1							
H/M/L indicate	es Stren	gth of Co	orrelatio	n H-H	igh, M-	Medium	i, L-Low				I		
		s tt											
	ses	and and are break and are break are											
	cienc	ering es Scienc m Cor m Elec m Flec cal Ski											
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	Ba	Er Sc	Hı So	Pr	Pr	Ő	Pr	Te	So				

1. Identification of cells in a blood smear

- 2. Identification of blood group
- 3. Immuno diffusion
- 4. Immunoelectrophoresis
- 5. Testing for typhoid antigens by Widal test
- 6. Isolation of monocytes from blood

Subject Cod	e:	Subject	Name :	INTERM	EDIARY	METABO	OLISM-II			L	T	Р	С	
HBB119B12		Prerequ	isite: Bio	ochemis	try & Mi	crobiolo	gy			3	1	0	4	
L : Lecture T	: Tutoi	rial P:P	roject C	: Credits	5								<u>. </u>	
OBJECTIV	'E:													
• To d	lescribe	e, in quan	titative	terms, tł	ne chem	ical char	nges cata	alyzed k	by the com	ponent	enzyme	es of tl	ne	
rout	e; and	to descri	be the va	arious in	tracellu	lar contr	ols that	govern	the rate at	which	the pat	nway		
	TCOM		By doin	g this co	nurse sti	idents w	vill							
			by dom	8 1110 00										
CO1		The va	rious bic	ochemica	al proces	ses resp	onsible	for the	synthesis c	of prote	ins and	amino)	
		acids (a	anapolis	m), and	the brea	ikdown (or protei	ins by c	atabolism.					
CO2		Better	understa	anding o	of how it	generat	es and h	ydrolyz	zes DNA an	d RNA I	molecul	es and	ł	
		their co	ompone	nts in th	e cell, in	the pro	cesses o	f DNA r	eplication,	repair,	recomb	oinatic	on cic	
		and br	eakdowr	ו טואא, נו ז	ranscrip			mA, an	u purme an	и руп	inume s	yntne	515	
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Mapping of	Course	Outcom	Dutcomes with Program Outcomes (POs)											
COs/POs	PO1	PO2	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9											
CO1	Н	L	м	М	м	L	L	L	н					
CO2	Н	L	м	м	м	L	L	L	н					
COs /	Р	SO1	PS	02	PS	03		I						
PSOs														
CO1		Н	ŀ	4	ŀ	4								
CO2		н	ŀ	1	ŀ	1								
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	s	Scien	pu o	a)	tive	S	oject							
	ence	ing 9	ies a	Core	Eleo	ective	/ Pro	ips /	S					
	c Sci	neer	anit	ram	ram	n Ele	tical	rnsh	Skill					
	Basi	Engi	Hum	Prog	Proę	Ope	Prac	Inte	Soft					
				~										

UNIT I:PROTEIN METABOLISM	9 Hrs
Degradation of proteins, Oxidative, Non- Oxidative	e deamination and decarboxylation of amino acids,
Urea Cycle and Creatinine formation.	
UNIT II: AMINO ACID METABOLISM -I	9 Hrs
BioSynthesisof amino acids	
UNIT III:AMINO ACID METABOLISM -II	9 Hrs
Degradation of amino acids	

UNIT IV:NUCLEIC ACID METABOLISM 9 Hrs

HBBT19B12 INTERMEDIARY METABOLISM-II L T P C

Biosynthesis and degradation of purine and pyrimidines nucleotides, inhibitors of nucleotides biosynthesis.

UNIT IV: PORPHYRIN METABOLISM 9 Hrs

Synthesis and degradation of Porphyrin Metabolis

Total no of Hours: 45

3 1 0 4

REFERENCE

- Biochemistry: (2nd ed.1995) Voet&Voet, John Wiley and Sons.
- Biochemistry: (4th ed. 1992) Stryer, L., W.H. Freeman & Co, NY.
- Harpers Biochemistry: (26th ed.).

Subject Code:	5	Subject Na	me : CLI	NICAI	BIOC	CHEMI	STRY			L	Т	Р	С
HBBT19B13	F	Prerequisit	e: Chemis	try						3	1	0	4
L : Lecture T : 1	Futori	al P:Proj	ect C: Cr	edits									
OBJECTIVE :													
• To dev	elop	understand	ding and p	orovide s	scientific	basics o	of the lif	e proces	ses at th	e mole	cular level	and inte	er-
relatio	nship	s of biomo	lecules an	d their	deviatio	n from r	normal a	nd their	consequ	lences	for interpre	eting ar	nd
solving	g clinio	cal probler	ns.		o nto sui	l ablata							
COURSE OUTC	UIVIE:	S (COS) : El	nd the yer	rse stud) cundore	tono hu	the hie m			stand	
01		their synt	hetic and	degrada	itive pat	hways.	sunder	some by		loiecule		stanu	
CO2		Understa	nd the pro	cess of	Biologic	al oxidat	tion invo	olved in t	he energ	y prod	uction by b	urning	
CO3		Understa	nd the var	ious dis	eases as	sociated	d with th	e errors	of metal	oolism	of the bio		
Manaina of Co		molecule	S.			(00-)							
iviapping of Co	ourse	outcomes	with Prog	gram Ou	icomes	(PUS)							
COs/POs	PO	1 PO2	PO3	PO4	PO9								
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CO2	н	I L M M M L L L H											
CO3	н	L	M	M	IVI	L	L	L	н				
COs / PSOs		PSO1	PSC	02	PS	03							
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CO2		Н	Н		ł	4							
CO3		н	Н		ł	1							
H/M/L indicat	es Str	ength of C	orrelatior	n H-Hi	gh, M- 1	Medium	, L-Low						
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		S	ial					cal					
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	enc	Sciel Sciel Sciel Cor											
	c Sci	ring ies a al / I = Elec b = Skill / I = Skill / I							oft SI				
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HBBT19B13 CLINICAL BIOCHEMISTRY L T P C 3 1 0 4

UNIT-I: BASIC CONCEPTS OF CLINICAL BIOCHEMISTRY

A brief review of units and abbreviations used in expressing concentrations and standard solutions. specimen collection and processing (Blood, urine, faeces). Anti-coagulant preservatives for blood and urine. Transport of specimens.

UNIT-II: DISEASES RELATED TO CARBOHYDRATE METABOLISM

Regulation of blood sugar, Glycosuria - types of glycosuria. Oral glucose tolerance test in normal and diabetic condition. Diabetes mellitus and Diabetic insipidus - hypoglycemia, hyperglycemia. Ketonuria, ketosis.

UNIT-III: INBORN ERRORS OF METABOLISM INTRODUCTION

Clinical importance, phenyl ketonuria, cystinuria, alkaptonuria, Fanconi's syndrome, galactosemia, albinism and tyrosinemia, Haemophilia, Lipid and lipoproteins: Classifications, composition, mode of action - Cholesterol. Factors affecting blood cholesterol level. Dyslipoproteinemias, IHD, atheroscelorosis, risk factor and fatty liver.

UNIT-IV: ORGAN FUNCTION TEST

Liver function test: Metabolism of bilirubin, jaundice - types, differential diagnosis. Icteric index, Vandenberg test, plasma protein changes, PTT. Renal function test : Clearance test - Urea, Creatinine, Inulin, PAH test, Concentration and dilution test. Gastric function test : Collection of gastric contents, examination of gastric residuum, FTM, stimulation test, tubeless gastric analysis.

UNIT-V: CLINICAL ENZYMOLOGY

Functional and non- Functional plasma enzymes. Isoenzymes with examples. Enzyme patterns in acute pancreatitis, liver damage, bone disorder, myocardial infarction and muscle wasting.

Total no of Hours: 45

REFRENCES:

- Text book of Clinical Biochemistry Carl A. Burdis and Edward R Ashwood •
- Text book of Medical Biochemistry Dr. M.N. Chatterjee and raneshinde ٠
- Clinical chemistry in diagnosis and treatment Philip D. Mayne
- Clinical chemistry William Hoffman
- Clinical Biochemistry with clinical correlation Devin, Wiley
- Practical clinical biochemistry Harold Varley, CBS, New Delhi •

9 Hrs

9 Hrs

9 Hrs

9 Hrs

9

Subject Code	: 5	Subject Na	ame :FO	L	т	Р	С							
1100113014	F	Prerequisi	te: Bioche	emistry,				3	1	0	4			
L : Lecture T :	L : Lecture T : Tutorial P : Project C: Credits													
OBJECTIVE	:													
Tostu	 Tostudy of nutrients in food, how the body uses them, and the relationship between diet, health, and disease. Nutritionists use ideas from molecular biology, biochemistry, and genetics to understand how 													
nutrie	nutrients affect the human body.													
COURSE OUTCOMES (COs) : At the end of studying this course the student to														
CO1		Get an idea about basic concept of nutrition of food and its importance												
CO2		Know ab	out nutrit	ive and	calorifi	c value	of food	and nut	ritional	significa	ance of			
		carbohyd	lrates											
CO3		Understand the structure and classification of vitamins and nutrients												
Mapping of C	Course	Outcome	es with P	rogram	Outcon	nes (PO	s)							
COs/POs	PO	L PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9					
CO1	н	L	М	М	М	L	L	L	н					
CO2	н	L	М	М	М	L	L	L	н					
CO3	н	L	М	М	М	L	L	L	н					
COs / PSOs	1	PSO1	PSO2		PSO3			1						
CO1		н	н		н									
CO2		н	н		н									
CO3		н	н		ŀ	ł								
H/M/L indica	tes St	rength of	Correlat	ion H-	High, N	/I- Med	ium, L-L	.ow		1				
		S	cial					cal						
		ence	Soc		es,		gt	schni						
	ces s Scie and roje roje													
	cien	erin	nitie: es	m C	ш ш	Elect	al / I	ships Sl	cills					
	asic S	Jgine	umal	ogra	ogra	pen	actic	itern	oft Sk					
	Bč	ы П	н х	Pr	-1-	0	-1-	드	S					
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 HBBT19B14
 FOOD & NUTRITION
 L T P C
 3 1 0 4

UNIT-I: BASIC TERMS USED IN STUDY OF FOOD AND NUTRITION 9 Hrs

Understanding relationship between food, nutrition and health. Concept of Balanced Diet, Food Groups, Food Pyramid

UNIT-II:NUTRITIONAL SIGNIFICANCE OF CARBOHYDRATES9 Hrs

protein, lipids, vitamins and minerals. Protein malnutrition (Kwashiorkar) and undernutrition (marasmus) and their preventive, curative measures.

UNIT-III: NUTRITIVE AND CALORIFIC VALUE OF FOOD

Unit of energy measurements of food stuffs by Bomb colorimeter, calorific value and RQ of food stuffs. Basic metabolic rate (BMR), its measurements and influencing factors, SDA of food. Nutritive value of protein, essential amino acid. Composition of balanced diet for infants, pregnancy and lactating women, old age.

UNIT-IV: STRUCTURE, CLASSIFICATION

Biochemical function and deficiency diseases of Vitamins

UNIT-V: STRUCTURE, CLASSIFICATION

Biochemical function and deficiency diseases of Micro and Macro nutrients.

Total no of Hours: 45

9 Hrs

9 Hrs

9 Hrs

REFERENCE

- Bamji MS, Krishnaswamy K, Brahmam GNV (2009). Textbook of Human Nutrition, 3rd Edition. Oxford and IBH Publishing Co. Pvt. Ltd.
- Srilakshmi (2007). Food Science, 4th Edition. New Age International Ltd.
- Srilakshmi,(2005), Dietetics, Revised 5th edition. New Age International Ltd.
- Wardlaw MG, Paul M Insel Mosby 1996). Perspectives in Nutrition, Third Edition. Core Course ICMR.

Subject Code :		Subject	Subject Name : ENVIRONMENTAL STUDIES											С
TIDIVICI7	Prerequ	isite : N		3	0	0	3							
L : Lecture T : Tutorial P : Project C: Credits														
OBJECTIVES :														
• 1	To acquire knowledge of the Environment and Ecosystem & Biodiversity													
• 7	To acquire knowledge of the different types of Environmental pollution To know many shout Natural Resources and excite investigation													
• 7	To know more about Natural Resources and social issues and the Environment To attain familiarity of human nanulation and Environment													
To attain familiarity of human population and Environment														
COURSE OUTCOMES (Cos) : Students completing the course were able to														
CO1	. To know about Environment and Ecosystem & Biodiversity													
CO2	To clearly comprehend air, water, Soil, Marine, Noise, Thermal and Nuclear Pollutions and													
	Solid Waste management and identify the importance of natural resources.													
CO3 To know about the natural resourcesand environmental problems associated with climate change, global warming, acid rain, ozone layer depletion etc., and explain possible solution.														
Mapping of Course Outcomes with Program Outcomes (POs)														
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	РО	7	PO8	PO9				
CO1	н	L	м	м	м	L	l	LL		н				
CO2	н	L	м	м	М	L	L		L	н				
CO3	Н	L	м	м	М	L	I	_	L	н				
COs / PSOs	P	SO1	PS	02	PS	03								
CO1		н	н	l	I	Н								
CO2		Н	н	l	I	Н								
CO3		Н	H	l	I	н								
H/M/L in	dicates st	rength of	correlat	ion H	– High,	M – M	ediu	ım,	L – Lov	/	I		l	
ategory	sic lences gg ences ences social ences		ciences	Dre	rogram Iectives)en		lectives	ractical /			nternships /	oft Skills	
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HBMG17001 ENVIRONMENTAL STUDIES L T P C 3 0 0 3

UNIT I ENVIRONMENT AND ECOSYSTEMS

Definition, scope and importance of environment – need for public awareness – concept, structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem. Biodiversity at National and local levels – India

UNIT II ENVIRONMENTAL POLLUTION9 Hrs

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Nuclear hazards (g) E-Wastes and causes, effects and control measures

UNIT III NATURAL RESOURCES9 Hrs

Forest resources: Use and over-exploitation, deforestation. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT9 Hrs

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns climate change, global warming, acid rain, ozone layer depletion, nuclear accidents ,central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT9 Hrs

Population growth, variation among nations – population explosion, environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health

Total no of Hours : 45

TEXT BOOKS: 1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004).

Benny Joseph, 'Environmental Science and Engineering', Tata McGrawHill, NewDelhi, (2006).

Subject Code:	Su	ubject Na	me :BASI	L	т	Р	С						
	Pr	rerequisit	3	1	0	4							
L : Lecture T : T	L : Lecture T : Tutorial P : Project C: Credits												
OBJECTIVE:													
The get	The goal is to emphasize the importance of pharmaceutical research and its usefulness in												
biotec	principles, and biopharmaceuticals.												
	JIES, al		s) : By de	oing th	is cour	se stuc	lents w	ill acqu	ire basi	c funda	amental k	nowled	dge
CO1	About the pharmaceutical industries and process of new drug dis												•
CO2	Т	o unders	stand the	pharma	acokinet	tic and	pharma	codynar	nic aspe	cts of d	lrugs.		
CO3	Т	o acquir	e basic kr	nowledg	ge abou	t the pr	eparatio	ons of va	arious the	erapeut	tic agents	and to	
	S	tudy bas	ics about	the pat	ent of p	harmad	ceutical	product	S.				
Mapping of Co	ourse O	utcomes	with Prog	ram Out	tcomes (POs)							
COs/POs	PO1	PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9											
CO1	Н	L	м	Μ	М	L	L	L	н				
CO2	н	L	М	Μ	м	L	L	L	н				
CO3	Н	L	м	М	М	L	L	L	н				
COs / PSOs	Р	SO1	PSC	02	PS	03		1					
CO1		н	н		Н								
CO2		Н	н		Н								
CO3		Н	н		I	Н							
H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low													
								_					
		Se	cial					nica					
		ienc	d So		ves		ect	Tech					
	ces	s Sci s anc bre ves vroje skill											
	cien	erin m El m Collisities erin lills											
	sic S	ginee man grar ence grar t t Ski t Ski											
	Ba	EU	Hu Sci	Pri	Pre	ŏ	Pr	=	So				
				~									
	I	1	1	1	1	1	1	1		1			

HBBT19B15 BASIC PHARMACEUTICAL SCIENCES L T P C 3 1 0 4

UNIT I: INTRODUCTION

Introduction to Pharmaceutical Industry, Regulatory aspects, Routes of Administration of Drugs and types of therapeutic agents.

UNIT II: PHARMACOKINETICS

Basic aspects of Pharmacokinetics. Absorption, Distribution, Biotransformation and Excretion. Factors affecting pharmacokinetics.

UNIT III:PHARMACODYNAMICS 9 Hrs

Basic aspects of Pharmacodynamics. Mechanism of drug action

UNIT IV: NEW DRUG DISCOVERY 9 Hrs

Steps involved in new drug discovery. Preclinical and clinical trials.

UNIT V: PHARMACEUTICAL PATENTS

Introduction about the Patents related to Pharmaceutical Products

Total no of Hours: 45

References:

- Gareth Thomas. Medicinal Chemistry. An introduction. John Wiley. 2000.
- Katzung B.G. Basic and Clinical Pharmacology, Prentice Hall of Intl. 1995.

9 Hrs

Subject Code:	Subjec	ibject Name : CLINICAL BIOCHEMISTRY LAB										Р	С
HBBT19BL6	Prerequisite: Chemistry										0	3	1
L: Lecture T : Tutorial P : Project C: Credits													
 OBJECTIVE : To learn and understand the principles behind the qualitative and quantitative estimation of biomolecules 													
COURSE OUT	COME	S (CC)s):\$	Stude	nts wi	ill acqu	ire kno	wledg	e abou	ıt			
C01	Basic Biochemistry calculations and general biochemical reactions for the identification of Biomolecules.												of
CO2	Quantitative estimation of Biomolecules												
CO3	Estimation of proteins and general isolation of molecules procedures.												
Mapping of Course Outcomes with Program Outcomes (POs)													
COs/POs	PO1	PO2	PC)3 P	04	PO5	PO6	PO7	PO8	PO9			
CO1	н	L	M		М	М	L	L	L	Н			
CO2	Н	L	Μ		Μ	М	L	L	L	Н			
CO2	н	L	Μ		Μ	М	L	L	L	Н			
COs / PSOs	PSC	01		PSO2		PS		L					
CO1	Н		Н				H						
CO2	Н			Н			H						
CO2	н			н			H						
H/M/L indicates	s Streng	th of C	Correla	ation	H- Hig	gh <i>,</i> M- N	/ledium,	L-Low		-		I	
	Basic Sciences		Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships/ Technical Skill	Soft Skills			
								~					

I. **BLOOD ANALYSIS**

- 1. Separation of Plasma
- 2. Separation of Serum
- 3. Estimation of Glucose
- 4. Estimation of Cholesterol
- 5. Enzyme analysis (SGOT,SGPT)

II. **URINE ANALYSIS**

- 1. Collection and preservation of urine
- 2. Normal Constituents
- 3. Abnormal Constituents
- 4. Estimation of Urea by DAM Method
- 5. Estimation of Creatinine by Jaff's Method

Subject Code	e: Su	bject N	ame : FO	L	Т	Р	С							
HBBT19BL7	Pre	erequisi	ite: Nil							0	0	3	1	
L : Lecture T :	re T : Tutorial P : Project C: Credits													
	BJECTIVE : To learn about how enzymes in food are used as a natural way to improve nutrition ternatives to chemical processing in the food industry.													
alternatives t	OURSE OUTCOMES (COs) : At the end of studying the course													
COURSE O	To study about the isolation techniques of various biomolecules from food													
CO1	lo sti	udy abo	out the i	solatio	n techr	niques	of varie	ous bioi	moleci	ules fr	om food	1.		
CO2	To stu	o study the analysis techniques for various compounds												
Mapping of (lapping of Course Outcomes with Program Outcomes (POs)													
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9					
C01	Н	L	М	М	м	L	L	L	H					
CO2	н	L	М	Μ	Μ	L	L	L	Н					
CO3	Н	L	М	Μ	Μ	L	L	L	Н					
COs / PSOs	PS	01	PSO2		PSO3									
CO1	I	Н	н		н									
CO2	I	Н	н		н									
CO3	I	Н	н		н									
H/M/L indica	H/M/L indicates Strength of Correlation H- High, M- Medium, L-Low													
			s d											
	c Sciences	ineering nces	nanities ar al Science	gram Core	gram tives	n Elective	ctical / ect	iternships chnical Sk	Skills					
	Basi	Eng	Hun Soci	Pro	Prog	Ope	Pra(lr Te	Soft					
							~							
FOOD AND ENZYME ANALYSIS L T P C 003 1

I. Isolation Techniques

1. Isolation of Starch from potatoes. 2. Isolation of Casein from Milk 3. Isolation of from Albumin from egg. 4. Isolation of from Lecithin from egg yolk.

II Quantitative Analysis

- 1. Estimation of β Carotene from carrots
- 2. Estimation of Calcium from milk
- 3. Estimation of Urease from Horse gram powder
- 4. Estimation of Acid phosphatase from Potato
- 5. Estimation of Protein from green gram powder
- 6. Estimation of glucose from grape juice

HBBT19BL7

Subject Code: HBBT19B16	Subj	ject Nar	ne : DAT	L	т	Р	С						
	Prerequisite: Basic Computer Science Engineering										1	0	4
L : Lecture T : ⁻	Futorial	P:Pro	ject C: C	redits									
OBJECTIVE	:												
 To ge 	t know	ledge i	n databa	se mar	nageme	ent, SC	L and	DB tran	saction				
COURSE OUTC	OMES	(COs) : /	At the en	d of thi	s course	e studer	nts will a	able to					
CO1	Get expertise how to retrieve the data stored in the database, with help SQL Understand how the data to be stored in electronic format by making use of Relational database												
CO2	Understand how the data to be stored in electronic format by making use of Relational database												
CO3	Understand the transaction reads a value from the database or writes a value to the database												
Mapping of Co	ourse O	utcome	s with Pr	ogram	Outcom	es (POs	5)						
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9				
CO1	L	L	L	Μ	Μ	L	Н	L	L				
CO2	L	L	L	Μ	Μ	L	Н	L	L				
CO3	L	L	L	Μ	Μ	L	Н	L	L				
COs / PSOs	PSO1		PSO2		PSO3								
CO1	H		Н		н								
CO2	Н		Н		Н								
CO3	Н		Н		Н								
H/M/L indicat	es Stre	ngth of	Correlati	on H-	High, N	I- Medi	um, L-Lo	w					
	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills				
		~											

DATA BASE MANAGEMENT L T P C 3 1 0 4 HBBT19B16

UNIT I: PURPOSE OF DATABASE

Overall System Structure - Entity Relationship Model - Mapping Constraints - Keys - E-R Diagrams -Relational Model - Structure

UNIT II: STRUCTURED QUERY LANGUAGE

Basic Structure - Set Operations - Aggregate Functions - Date, Numeric, and Character Functions -Nested Sub queries -Modification Of Databases - Joined Relations-DDL - Embedded SQL.

UNIT III: RELATIONAL DATABASE DESIGN

Pitfalls - Normalization Using Functional Dependencies - First Normal Form-Second Normal Form-Third Normal Form-Fourth Normal Form And BCNF.

NIT IV: INDEXING & HASHING

File and system structure – overall system structure file transaction – data dictionary – indexing and hashing basic concepts. static and dynamic hash functions **Transaction Management**

UNIT V: TRANSACTIONS

Transaction Concept- Properties of a Transaction- A Simple Transaction Mode- Concurrent Executions- Schedules- Serial and Non Serial types-Serialization of schedules and views-locks based protocols-time based protocols.

Total Hours: 45 Hrs

TEXT BOOK:

1. Abraham Silberschatz, H.F.Korth and S.Sudarshan-Database System Concepts McGraw Hill

Publication.

2. Singh-Database systems: Concepts, Design & applications, Pearson Education.

REFERENCE BOOK:

- 1. Gerald V.Post DBMS-Designing and Business Applications McGraw Hill Publications
- 2. Michael Abbey and Michael J. Corey-Oracle- A Beginners guide TMH

9 Hrs

9 Hrs

9 Hrs

9 Hrs

9 Hrs

Subject Code HBBT19B17	e: S 7	ubject Na	L	т	Р	C									
110011/01/	P	rerequisit	3	1	0	4									
L : Lecture T :	: Tutoria	l P:Proje	ect C: Cre	edits									1		
OBJECTIVE	E:														
 To le pair gene 	earn nu wise ar e predic	cleotide, p nd multiple tion meth	protein ai e sequen lods in pr	nd geno ce aligr okaryot	ome data nment an es and o	abases nd the p eukaryo	and kno principle ptes	and to g	t the file gain kno	format: wledge	s. To und on appro	lerstand baches	l for		
COURSE OUT	COMES	(COs) : Up	oon comp	letion o	f this cou	urse, stu	idents w	ill be abl	e to						
CO1	I	Develop bi	op bioinformatics tools with programming skills.												
CO2	/	Apply com	y computational based solutions for biological perspectives.												
CO3	D3 Pursue higher education in this field.														
Mapping of (Course C	Outcomes	with Prog	gram Ou	tcomes (POs)									
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9						
CO1	н	L	М	м	м	L	н	L	н						
CO2	н	L	М	м	м	L	н	L	н						
CO3	н	L	м	м	м	L	н	L	н						
COs / PSOs		PSO1	PSO2		PSO3										
CO1		н	н		н										
CO2		н	н		н										
CO3		н	н		н										
H/M/L indica	ates Stre	ength of Co	orrelation	H- Hig	 gh, M- M	ledium,	L-Low								
	Basic Sciences	Engineering Sciences	Humanities and Social Sciences	Program Core	Program Electives	Open Electives	Practical / Project	Internships / Technical Skill	Soft Skills						

HBBT19B17 BASIC BIOINFORMATICS L T P C 3 1 0 4

UNIT I: BIOLOGICAL DATABASES AND DATA RETRIEVAL 9 Hrs

Nucleotide databases (Genbank, EMBL), Sequence submission Methods and tools (Sequin, Sakura), Sequence retrieval systems (Entrez), Protein (Swiss-Prot, Tr-EMBL, Expasy), Genome (NCBI, EBI, TIGR), Metabolic Pathway DB (KEGG)

UNIT II: PAIRWISE SEQUENCE ALIGNMENT 9 Hrs

Multiple Sequence AlignmentSimilarity, Identity and Homology, Global Alignment, Local Alignment, Database Search methods & tools, Scoring Matrices, Significance of MSA, Scoring of MSA, PSI/PHI-BLAST

UNIT III:GENE PREDICTION 9 Hrs

Gene structure in Prokaryotes and Eukaryotes, Gene prediction methods, Neural Networks, Pattern Discrimination methods, Signal sites Predictions (Promoter, Splice, UTR, CpG-islands), Tools used for gene prediction in prokaryotes and eukaryotes. Methods of Construction of Phylogenetic trees.

UNIT IV: PROTEIN PREDICTION 9 Hrs

Protein- physical properties, secondary structure, alpha & beta structure, motifs, tertiary structures, specialized structure and function, protein data bank (PDB), Molecular visualization - protein conformation and visualization tool (RASMOL).

UNIT V:NUTRIGENOMICS

Introduction to Nutrigenomics and Nutraceuticals

Total no of Hours: 45

REFERENCES

- Introduction to Bioinformatics A. Lesk 2002, Oxford University Press
- Fundamental concepts of Bioinformatics by D.E. Krane and M.L Raymer, Pearson Education 2003 ISBN 81-297-0044-1
- Current Protocols in Bioinformatics, Edited by A.D. Baxevanis et. al., Wiley Publishers 2005
- Introduction to Computational Molecular Biology by Joao Carlos Setubal, Joao

HBMG17G01ENTREPRENEURSHIP DEVELOPMENTL T P C

3 0 0 3

ENTERPRENEURIAL DEVELOPMENT LTPC Unit - I Concept of Entrepreneurship Entrepreneurship - Meaning - Types - Qualities of an Entrepreneur - Classification of Entrepreneur - Factors influencing Entrepreneurship - Functions of Entrepreneurships. Unit - II Entrepreneurial Development Agencies Commercial Banks - District Industries Centre - National Small Industries Corporation - Small Industries Development Organisation - Small Industries Service Institute, All India Financial Institutions - IDBI - IFCI - ICICI - IRDBI. Unit - III Project Management Business idea generation techniques - Identification of Business Opprtunities - Feasibility study - Marketing, Finance, Technology and Legal Formalities - Preparation of project report - Tools of Appraisal. Unit - IV Entrepreneurial Development Programmes Entrepreneurial Development Programmes (EDP) - Role, relevance and achievements - Role of Governemnt in organisind EDPs - Critical Evaluation. Unit - V Economic Development and Entrepreneurial Growth Role of Entrepreneurs in Economic Growth - Strategic approaches in the changing Economic scenario for small scale Entrepreneurs - Networking. Niche play, Georgraphic Concentration. Franchising / Dealership - Development of Women Entrepreneurship. Books: 1. Dr. V. Balu - ENTREPRENEURIAL DEVELOPMENT 2. Dr. P.T. Vijayashree & Dr. M. Alagammai - ENTREPRENEURIAL DEVELOPMENT C.B. Semt

PROJECT WORK

Individual or a group comprising of 4 or 5 students were expected to choose a research problem and execute it with proper data. They will explain their research project to a committee of faculty members.



C. B. Palaminde

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