C. ABDUL HAKEEM COLLEGE [AUTONOMOUS]

[Affiliated to Thiruvalluvar University, Vellore]

MELVISHARAM – 632509

Syllabus under CBCS Pattern
Learning Outcome Based Curriculum Frame work [LOCF]
with effect from 2018 onwards

B.Sc. Zoology

Prepared By
PG & Research Department of Zoology

Programme Outcome (PO) for BSc Course

PO1	**Critical Thinking and Scientific Reasoning** Capable of critical thinking after attaining disciplinary knowledge and understanding of major concepts, theoretical principles and experimental findings for scientific reasoning in the field of basic sciences.
PO2	**Problem Solving** Ability to have efficient problem-solving skills in relevance to the society based on the knowledge and skills acquired from sciences.
PO3	**Skill Development** Capable of demonstrating science including broader in interdisciplinary fields and ability to use modern instruments/information technology related to sciences. Promote the quality of good scientific researcher, leadership and governing skills.
PO4	**Effective Communication** Ability to impart complex technical knowledge related to science in writing and oral skills.
PO5	**Social Responsibility** Demonstrate various social problems and empathy and equity-based personnel development and ability to participate in real life as volunteer and act as a true citizen

Programme Specific Outcomes

B.Sc. Zoology	
PSO1	Acquire knowledge on the rules of taxonomy and the principle of animal classification and Understand the diversity, morphology, biological characters and taxonomical importance different animal groups.
PSO2	Analyzethe biology of cell, genetic principles, instrumental application, physiological principles, environmental issues etc.
PSO3	Impart knowledge on ecology of fishes, amphibian's reptiles, birds and mammals and develop employment skill on sericulture, agriculture, entomology, fisheries and aquaculture and become good entrepreneurs.
PSO4	Impart knowledge on research through internship, experiment on various biological phenomena and analyze the data.
PSO5	Attain knowledge of various biochemical and physiological phenomena of animals and developingbasic skills on laboratory technology and tounderstand and operate physiological instruments

For Candidates admitted from June 2018 onwards)

C. ABDUL HAKEEM COLLEGE (AUTONOMOUS), MELVISHARAM-632509

PG AND RESEARCH DEPARTMENT OF ZOOLOGY

B.Sc. ZOOLOGY

CBCS PATTERN (REGULATIONS 2018 - 2019)

The Course of Study, Credits and Scheme of Examinations

I YEAR

S.No	Part	Course Title	Subject Codes	Hrs/ week	Credits	Title of the Paper	Maximum Marks		
I YEAR			**SEMESTER I**				**CIA Mark**	**EXT Mark**	**TOTAL Mark**
1	I	Language	U18FTA101/ U18FUR101	6	4	Tamil/Urdu/Others-I	25	75	100
2	II	English	U18FEN101	6	4	English-I	25	75	100
3	III	Main-Theory	U18MZL101	6	6	Invertebrata	25	75	100
	III	Main-Practical	U18MZLP21	3	0	Practical-I Invertebrata and Chordata	0	0	0
4	III	Allied-I Theory	U18ABY101/ U18AZL101	4	4	(Choose any one) Botany -I/Apiculture-I	25	75	100
	III	Allied-I Practical	U18ABYP21/ U18AZLP21	3	0	Allied Practical-I Botany/ Apiculture	0	0	0
5	IV	Environmental Studies	U18CES101	2	2	Environmental Studies	25	75	100
				30	**20**		**125**	**375**	**500**
I YEAR			**SEMESTER II**				**CIA Mark**	**EXT Mark**	**TOTAL Mark**
6	I	Language	U18FTA201/ U18FUR201	6	4	Tamil/Urdu/Others-II	25	75	100
7	II	English	U18FEN201	4	4	English-II	25	75	100
8	III	Main-Theory	U18MZL201	6	5	Chordata	25	75	100
9	III	Main-Practical	U18MZLP21	3	3	Practical-I Invertebrata and Chordata	25	75	100
10	III	Allied-I Theory	U18ABY201/ U18AZL201	4	4	(Choose any One) Botany –II/ Apiculture-II	25	75	100
11	III	Allied-I Practical	U18ABYP21/ U18AZLP21	3	2	Allied Practical-I Botany/ Apiculture	25	75	100
12	IV	Soft Skills	U18CSS201	2	1	Soft Skills	25	75	100
13	IV	Value Education	U18CVE201	2	2	Value Education	25	75	100
				30	**25**		**200**	**600**	**800**

II YEAR

S.No	Part	Course Title	Subject Codes	Hrs/ week	Cred its	Title of the Paper	Maximum Marks		
II YEAR		**SEMESTER III**					**CIA Mark**	**EXT Mark**	**TOTAL Mark**
14	I	Language	U18FTA301/ U18FUR301	6	4	Tamil/Urdu/Others-III	25	75	100
15	II	English	U18FEN301	6	4	English-III	25	75	100
16	III	Main-Theory	U18MZL301	3	3	Cell and Molecular Biology	25	75	100
	III	Main-Practical	U18MZLP41	3	0	Practical-II Cell and Molecular Biology, Gentics and Biotechnology	0	0	0
17		Allied-II Theory	U18AZL301/ U18ACH301	4	4	**(Choose any One)** Economic Entomology-I/ Chemistry-I	25	75	100
	III	Allied-II Practical	U18AZLP41/ U18ACHP41	3	0	Allied Practical-II Economic Entomology/ Chemistry	0	0	0
18	IV	Skill Based Subject	U18SZL301	3	3	Public health and hygiene **(SBS-I)**	25	75	100
19	IV	Non Major Elective	U18NZL301	2	2	Poultry Farming-I **(NME-I)**	25	75	100
				30	**20**		**150**	**450**	**600**
II YEAR		**SEMESTER IV**					**CIA Mark**	**EXT Mark**	**TOTAL Mark**
20	I	Language	U18FTA401/ U18FUR401	6/4*	4/3*	Tamil/Urdu/Others-IV	25	75	100
21	I	Urdu Lab	U18FURP41	2*	1*	Practical Urdu	25	75	100
22	II	English	U18FEN401	6	4	English-IV	25	75	100
23	III	Main-Theory	U18MZL401	3	3	Gentics and Biotechnology	25	75	100
24	III	Main-Practical	U18MZLP41	3	3	Practical-II Cell and Molecular Biology, Gentics and Biotechnology	25	75	100
25		Allied-II Theory	U18AZL401/ U18ACH401	4	4	**(Choose any One)** Economic Entomology-II/ Chemistry-II	25	75	100
26	III	Allied-II Practical	U18AZLP41/ U18ACHP41	3	2	Allied Practical-II Economic Entomology/ Chemistry	25	75	100
27	IV	Skill Based Subject	U18SZL401	3	3	Poultry Farming **(SBS-II)**	25	75	100
28	IV	Non Major Elective	U18NZL401	2	2	Poultry Farming-II **(NME-II)**	25	75	100
				30	**25**		**225**	**675**	**900**

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III YEAR

S.No	Part	Course Title	Subject Codes	Hrs/ week	Cre dits	Title of the Paper	Maximum Marks		
III YEAR		**SEMESTER V**					**CIA Mark**	**EXT Mark**	**TOTAL Mark**
29	III	Main- Theory	U18MZL501	6	5	Biostatistics & Bioinformatics	25	75	100
30	III	Main-Theory	U18MZL502	6	5	Developmental Biology & Immunology	25	75	100
31	III	Main-Theory	U18MZL503	6	5	Animal Physiology	25	75	100
	III	Main-Practical	U18MZLP61	3	0	Practical-III Animal Physiology, Developmental Biology & Immunology	0	0	0
	III	Main-Practical	U18MZLP62	3	0	Practical-IV Environmental Biology & Economic Zoology	0	0	0
32	III	Elective	U18EZL501/ U18EZL502/ U18EZL503	3	3	**(Choose any One)** Bioinstrumentation/ Endocrinology/ Reproductive biology **(Elective- I)**	25	75	100
33	III	Main	U18EINP51	0	2	Internship Training	25	75	100
34	IV	Skill Based Subject	U18SZL501	3	2	Fisheries and Aquaculture **(SBS-III)**	25	75	100
				30	**22**		**150**	**450**	**600**
III YEAR		**SEMESTER VI**					**CIA Mark**	**EXT Mark**	**TOTAL Mark**
35	III	Main- Theory	U18MZL601	5	5	Environmental Biology	25	75	100
36	III	Main-Theory	U18MZL602	5	4	Economic Zoology	25	75	100
37	III	Main-Theory	U18MZL603	5	4	Evolution	25	75	100
38	III	Main-Practical	U18MZLP61	3	3	Practical-III Animal Physiology, Developmental Biology & Immunology	25	75	100
39	III	Main-Practical	U18MZLP62	3	3	Practical-IV Environmental Biology & Economic Zoology	25	75	100
40	III	Elective	U18EZL601/ U18EZL603/ U18EZL604	3	3	**(Choose any One)** BioChemistry/Sericulture/Food, Nutrition & Health **(Elective- II)**	25	75	100
41	III	Elective	U18EZL602/ U18EZL605/ U18EZL606	3	3	**(Choose any One)** Wildlife Conservation/ Ecotourism/ Animal systematics **(Elective-III)**	25	75	100
42	IV	Skill Based Subject	U18SZL601	3	2	Medical Lab Techniques **(SBS-IV)**	25	75	100
43	V	Extension Activities	U18CEA601	0	1	Extension Activities	-	100	100
				30	**28**		**200**	**700**	**900**

OVERALL COURSE
CREDITS & MARKS STRUCTURE

PART	COURSE TITLE	NO OF PAPERS	HOURS	CREDITS	MARKS FOR EACH PAPER	TOTAL MARKS
I	Tamil/Urdu/Others	4	24/22*	16/15*	100	400
I	Practical Urdu	1	2*	1*	100	100
II	English	4	22	16	100	400
III	Main-Theory	10	51	45	100	1000
III	Main- Practical	4	24	12	100	400
III	Allied-I Theory	2	8	8	100	200
III	Allied-I Practical	1	6	2	100	100
III	Allied-II Theory	2	8	8	100	200
III	Allied-II Practical	1	6	2	100	100
III	Major Elective	3	9	9	100	300
III	Internships Training	1	0	2	100	100
IV	Non Major Elective	2	4	4	100	200
IV	Skill Based-Subjects	4	12	10	100	400
IV	Soft Skills	1	2	1	100	100
IV	Environmental Studies	1	2	2	100	100
IV	Value Education	1	2	2	100	100
V	Extension Activities	1	0	1	100	100
	TOTAL	**43**	**180**	**140**	**-**	**4300**

PART TYPE	COURSE TYPE	NUMBER OF PAPERS	HOURS	CREDITS	MARKS
I	TAMIL/URDU/OTHERS	4+1*	24	16	500
II	ENGLISH	4	22	16	400
III	MAJOR, ALLIED, ELECTIVE & INTERNSHIP TRAINING	24	112	88	2400
IV	NON-MAJOR, EVS, SOFT SKILLS, SKILL BASED & VALUE EDUCATION	9	22	19	900
V	EXTENSION ACTIVITIES	1	-	1	100
	TOTAL	**43**	**180**	**140**	**4300**

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C. ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for First year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

Class	: UG First year B.A.,B.Sc.,&B.Com (C.S)	Semester	: I
Subject Code	: U18FTA101	Title	: Part-I Tamil
Credits	: 4	Max Marks	: 75

OBJECTIVES	தமிழ் மொழியின் இலக்கிய, இலக்கணச் செழுமைகளைப் பயிற்சிகளின் வழி வெளிக்கொணர்தல்.
COURSE OUTCOME(S)	
CO1	பக்தி இயக்க காலத்தில் சமூகப் பண்பாட்டு வரலாற்றை இனம் காணல். கவிதை வழி சமூகச் சிந்தனைகளையும் இயற்கையின் முக்கியத்துவத்தையும் கவிதை வழி இயம்பல்.
CO2	தமிழ் உரைநடை இலக்கியங்களில் உள்ள நேர மேலாண்மை மற்றும் அறிவியல் தமிழ் குறித்த பதிவுகளை விளக்குதல். தமிழ்ச் சிறுகதைகளில் தனி மனித மன உணர்வுகளை வெளிக் கொணரல்.
CO3	செவ்வியல் இலக்கிய நெடிய வரலாறு, இலக்கணப் பயிற்சி வழி போட்டித் தேர்வுகளை எதிர்கொள்ளல்.

பாடத்திட்டம்

அலகு - 1 பக்தி

1. திருமூலர் - திருமந்திரம் (7 பாடல்கள்)
2. மு. மேத்தா - நாயகம் ஒரு காவியம்
   அ. தலைக்கு விலை
   ஆ. சிலந்தி செய்த செயல்
3. சேவியர் - இயேசுவின் கதை
   அ. சிலுவை, ஆ. உன்னதரின் உயிர்ப்பு

அலகு - 2 கவிதை

1. பாரதியார் - கண்ணம்மா என் குழந்தை (முழுவதும்)
2. பாரதிதாசன் - குடும்ப விளக்கு - முதியோர் காதல் (தேர்ந்தெடுத்த 10 பாடல்கள்)
3. கவிமணி - ஆறு தன் வரலாறு கூறுதல்
4. நா.காமராசன் - கறுப்பு மலர்கள்
   அ. வானவில், ஆ. கடல்
5. அப்துல் காதர் - மின்னல் திரிகள் - மெழுகுவர்த்தியும் ஊதுவத்தியும்

அலகு - 3 உரைநடை

1. அப்துல் ரகுமான் - எம்மொழி செம்மொழி
2. வா.செ. குழந்தைசாமி - அறிவியலும் வறுமையொழிப்பும்
3. வெ. இறையன்பு - நேரம் கடிகாரத்தில் இல்லை

அலகு - 4 சிறுகதை

1. மேலாண்மை பொன்னுசாமி - அன்பூவாசம்
2. வைரமுத்து - இப்படியும் ஒருவன் இறந்தான்
3. வண்ணதாசன் - ஓர் உல்லாசப் பயணம்

C. Abdul Hakeem College (Autonomous), Melvisharam.

அலகு - 5

அ. இலக்கிய வரலாறு

1. பக்தி & சமய இலக்கியங்கள் - அறிமுகம்
   (சைவம், இசுலாம், கிறித்தவம்)
2. இக்கால இலக்கியங்கள் - தோற்றமும் வளர்ச்சியும்
   (கவிதை, உரைநடை, சிறுகதை)

ஆ. திறனறிப் பயிற்சி

1. அகரவரிசைப்படுத்துதல்
2. வல்லினம் மிகும் இடங்கள்
3. வல்லினம் மிகா இடங்கள்
4. சந்திப்பிழை நீக்குதல்
5. பொதுக் கட்டுரை

பார்வை நூல்கள்

1	இலக்கியச் சோலை	-	சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு. 2018 சூன் வெளியீடு
2	மினனல் திரிகள்	-	அப்துல் காதர் சல்மா பதிப்பகம்,வாணியம்பாடி, முதல் பதிப்பு,2004
3	இயேசுவின் கதை	-	சேவியர் யாளி பதிவு வெளியீடு, கோடம்பாக்கம் சென்னை- 24 முதல் பதிப்பு -2005
4	எம்மொழி செம்மொழி	-	கவிக்கோ அப்துல் ரகுமான் நேஷனல் பப்ளிஸர்ஸ்,தி.நகர், சென்னை -17 முதல் பதிப்பு -2010
5	தமிழ் இலக்கிய வரலாறு	-	பேரா.மது.ச.விமலானந்தம் அபிராமி பதிப்பகம், இராயபுரம், சென்னை -13 மறு பதிப்பு -2002
6	நற்றமிழ் இலக்கணம்	-	டாக்டர்.சொ.பரமசிவம், பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு, சென்னை -40 பன்னிரண்டாம் பதிப்பு -2012

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all I Year UG Course effective from the year 2018-2019

Year: I Year Subject Code : U18FUR101/U18FUR102 Semester : I

Part - I Title: **URDU - I**

Credits: 4 Max. Marks. 75

Prose, Grammar & Letter Writing

OBJECTIVES	✓ To promote students' proficiency in the basics of Urdu. ✓ To accelerate their zeal to cultivate Writing Skills. ✓ To strengthen their reading and receptive skills.
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	Explain the ethical values from the selected proses.
CO2	Design the formal and informal letters.
CO3	Develop the reading and writing skills.

BOOK PRESCRIBED: "ADAB-E-JAMEEL"
Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

Unit – I

1.SAIR PAHLAY DARWESH KI – Meer Amman Dehalvi
2.UMEED KI KHUSHI – Sir Syed
3.Letter to the Principal Seeking Leave

Unit – II

1.MIRZA GHALIB KE AKHLAQ WA ADAT – Moulana hali
2.ZUBAIDA KHATOON – Abdul Haleem Sharar
3.Zameer Aur Uski Khismien
4.Letter to the Manager of a Firm Seeking Employment

Unit – III

1.NOOR JHAN – Mohamed Hussain Azad
2.SAWERE JO KAL ANKH MERI KHULI – Patras Bukhari
3.Sifat Aur Uski Khimein
4.Letter to a Publisher of Book Seller Placing Order for Books

Unit – IV

1.KHUD GHARAZ DOST – Duputi Nazeer Ahmed
2.SIR SYED MARHOOM AUR URDU LITERATURE – Allama Shibli
3.Letter to the Father / Guardian Asking Money for Payment of College Fees

Unit – V

1.Letter to a Friend Inviting Him to Your Sister's Marriage
2.Sifat Aur Uski Khimein
3.Fe'l Aur Uski Khimein
4.Lawazim-E-Ism
5.Alamat-E-Fael "Nay" Aur Alamat-E-Mafo'ol "Ko" Ke Quaide

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Syllabus for all I Year UG Course effective from the year 2018-2019

Year: I Year Subject Code : U18FHN101 Semester : I

Part - I Title: **HINDI - I**

Credits: 4 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	
CO2	
CO3	

UNIT – I **PROSE:** GADYA MUKUR

Lessons prescribed:

1. AATMA NIRBHARTHA by Pt. Balkrishna Bhatt
2. MITRATA by Ramchandra Shukla
3. MADHUR BHASHAN by Gulab Roy
4. HEENGVALA by Subhadrakumari Chouhan
5. AJATSHATRU by Jay shankar Prasad

UNIT – II. **APPLIED GRAMMAR-**

Prescribed Points: 1. Gender, 2. Number, 3. Causal Verbs, 4.Voice, 5. Spell Check.

UNIT –III **LETTER WRITING:**

Prescribed Letters: (Personal & Commercial): 1. Ordering for books, 2. Letter for Employment, 3. Letter of Complaint, 4. Opening an Account in Banks, 5. Letter to Parents, 6. Letter to a Friend.

UNIT –IV **FUNCTIONAL HINDI - I: Administrative & Business**

Terminology: TERMS from English to Hindi & Terms from Hindi to English

UNIT –V FUNCTIONAL HINDI - II: Administrative & Business

Terminology: PHRASES from Hindi to English

BOOK FOR STUDY: GADYA MUKUR, Ed. SHAIK ABDUL WAHAB, RAKA PRAKASHAN, ALLAHABAD, 2011

BOOKS FOR REFERENCE:

1.HINDI VYAKARAN BY SHASTRI & APTE, D.B.H. PRACHAR SABHA, CHENNAI, 1998

2. PRAMANIK ALEKHAN AUR TIPPAN, PROF. VIRAJ, RAJPAL & SONS, KASHMERE GATE, DELHI, 2001

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all I Year UG Course effective from the year 2018-2019

Year: I Year Subject Code: U18FEN101 Semester: I

Part - I Title: **ENGLISH - I**

Credits: 4 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	
CO2	
CO3	

UNIT - I **PROSE**

1. The Curse of Untouchability — M.K. Gandhi
2. India and Democracy — Dr. B.R. Ambedkar
3. The Ant and the Grasshopper — W.S. Maugham
4. My Lost Dollar — Stephan Leacock

UNIT – II **POETRY**

1. All the World is a Stage — William Shakespeare
2. La Belle Dame Sans Merci — John Keats
3. Ozymandias — P.B. Shelley
4. River — A.K. Ramanujan

UNIT - III **SHORT STORIES**

1. The Doctor's Word — R. K. Narayan
2. The Model Millionaire — Oscar Wilde

UNIT - IV **ONE-ACT PLAY & BIOGRAPHY**

1. The Refund — Fritz Karinthy
2. Biography of Socrates

UNIT - V **WARM UP**

1. **Lexical Skills:**
    1. Words
    2. Synonyms and Antonyms
    3. Homonyms, Homophones
    4. Words often confused
2. **Descriptive Grammar:**
    1. Describing the Parts of Speech
    2. The Phrase and The Clause
    3. The Sentence and its types
    4. Nouns
3. **Traditional Grammar:**

1. The Tenses- Introduction
   Present Tense
   - Simple Present Tense
   - Present Continuous Tense
   - Present Perfect Tense
   - Present Perfect Continuous Tense
2. Voice of the Verb

4. Communication Skills (LSRW):

1. Greeting
2. Introducing
3. Inviting someone
4. Seeking Permission

English for Communication - I

5. Composition:

1. Letter Writing
2. Dialogue Writing
3. Report Writing
4. Précis Writing
5. Reading for Comprehension

English for Communication - I

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I B.Sc. Zoology effective from the year 2018-2019

Year: I Year Subject Code : U18MZL101 Semester : I

Major - 1 Title: **INVERTEBRATA**

Credits: 6 Max. Marks. 75

OBJECTIVES	To understand the systematic and functional morphology of various groups of invertebrates. To study their economic importance, affinities and adaptations.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Explain the principles of taxonomy and study Protozoa
CO2	Outline the structure and adaptation of Porifera and Coelenterates
CO3	Compare the structure of helminthes, annelids and arthropods
CO4	Justify the characters and importance of Molluscs and Echinoderms.

UNIT – I

Principles of Taxonomy –classical and quantitative method of Animal taxonomy, Binomial nomenclature – classification of the animal kingdom.

PROTOZOA: General characters and classification up to classes with examples.

Type study*: Paramecium*-general organization, Cyclosis, Conjugation.

General topic: Parasitic Protozoans (*Entamoeba* and *Plasmodium*)

UNIT – II

PORIFERA: General characters and classification up to classes with examples.

Type study –Sycon General organization, Skeleton and Reproduction

General topic: Canal system in sponges.

COELENTERATA: General characters and classification up to classes with examples.

Type study – Obelia- Structure of Obelia colony, polymorphism, Reproduction and alternation of generations.

General topic: Corals and Coral reefs

UNIT – III

HELMINTHES: General characters and classification up to classes with examples.

Type study –*Taenia solium*- Morphology, digestive, excretory, Reproductive system and life cycle.

General topic: Helminth parasites and parasitic adaptation.

UNIT – IV

ANNELIDA: General characters and classification up to classes with examples.

Type study: *Earth worm*- Morphology, Morphology, digestive, excretory, Reproductive system

General topic: Peripatus and its affinities

ARTHROPODA: General characters and classification up to classes with examples.

Type study – Prawn-Morphology, Appendages, Digestive, excretory and Reproductive system

General Topics: Larval forms in Crustaceans, Social life in insects

UNIT – V

MOLLUSCA: General characters and classification up to classes with examples.
Type study –freshwater mussel- Morphology, digestive, excretory and Reproductive system.
General topic: Foot in mollusca
ECHINODERMATA: General characters and classification up to classes with examples.
Type Study- Sea star- Morphology, digestive, excretory and Reproductive system
General Topics: Water Vascular system, Echinoderm larvae and their significance.

Reference Books:

1. Ekambaranatha Ayyar.M. and T.N. Ananthakrishnan, 1992. Manual of Zoology Vol.1 [Invertebrata], Viswanathan [Printers and Publishers] Pvt. Ltd.; Madras.
2. Jordan, E.L. and P.S.Verma, 2011. Invertebrate Zoology, 12th Edition. S.Chand and Co.Ltd., New Delhi.
3. Kotpal, R.L. 1988-1992 Protozoa, Porifera, Coelenterata, Helminthes, Annelida, Arthropoda, Mollusca, Echinodermata. Rastogi Publications, Meerut.
4. Parker and Haswell, 1964. Text Book of Zoology. Vol.1 [Invertebrata].A.Z.T; B.S.Publishers and distributors, New Delhi.
5. L.A Borradile and F.A.Pott.The Invertebrates.Cambridge University Press. UK.
6. P.S.Dhami and J.K.Dhami. Invertebrate Zoology, S.Chand and Co. New Delhi.
7. Hyman L.H. 1955. The Invertebrate Vol.I-IV., McGraw Hill Co. New York.
8. Barrington, 1969. E.J.W. Invertebrate structure and function.ELBS Publication.
9. Barnes.1968. Invertebrate Zoology. Toppan International Co.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I B.Sc., Zoology effective from the year 2018-2019

Year: I Year Subject Code: U18ABY101 Semester: I

Allied - 1 Title: **BOTANY – I (ALLIED)**

Credits: 4 Max. Marks. 75

OBJECTIVES	To gain basic knowledge on plant cell, tissue, bacteria, virus, algae, fungi, bryophyte, pteridophyta and gymnosperm with examples.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Recall fundamental knowledge on types, structure and function of cell
CO2	Describe the tissue system in plant body
CO3	Describe basic information about microscopic organism
CO4	Elaborate the life history and economic importance of lower plants

UNIT-I: Cell Biology

Prokaryotic and Eukaryotic cell (plant cell)

Cell organelles - Chloroplast, Mitochondrion and Nucleus.

Cell division – Mitosis.

UNIT-II: Anatomy

Tissues - Meristematic and permanent tissues. Primary and Normal Secondary thickening of Dicot stem.

UNIT-III: Bacteria and Viruses

Bacteria - General characters - shape - flagellation - Structure of E. Coil -reproduction - (Vegetative and asexual), Economic importance. Structure of Tobaco Mosaic Virus,Bacteriophage.

UNIT-IV: Structure and Life History of

a) Chlorella and Gracilaria

b) Albugo, Penicilium and Agaricus

UNIT-V: Structure and Life History of

a) Funaria

b) Lycopodium

c) Cycas

Economic importance of Chlorella, Penicillium and Agaricus.

Suggested Readings:

Ashok Bendre, A.K. and Pandey P.C. (1975) Introductory Botany. Rastogi Publication Meerut.

Ganguly, A.K. and Kumar. N.C. (1971) General Botany Vol. I & Vol. II, Emkay Publication, Delhi.

Rev. Fr. Ignacimuthu, S.J. (1975) Basic Biotechnology – Tata Mcraw till publication co., New Delhi.

Rao, K.N. Krishnamoorthy, K.V. and Rao. G. (1975) Ancillary Botany. S. Viswanathan Private. Ltd., Chennai.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I B.Sc., Zoology effective from the year 2018-2019

Year: I Year Subject Code: U18AZL101 Semester: I

Allied - 1 Title: **APICULTURE – I (ALLIED I)**

Credits: 4 Max. Marks. 75

OBJECTIVES	To gain basic knowledge on apiary with reference to the local area
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Identify and classify bees
CO2	Describe the honey bee rearing system
CO3	Identify bee diseases
CO4	Analyze honey economy

Unit 1: Biology of Bees

Apis and Non-Apis Bee species and their identification. General Morphology of Apis Honey Bees Social Organization of Bee Colony

Unit 2: Rearing of Bees

Artificial Bee rearing (Apiary), Beehives – Newton and Langstroth box

Bee Pasturage

Selection of Bee Species for Apiculture

Modern Bee Keeping Equipment

Methods of Extraction of Honey (Indigenous and Modern)

Unit 3: Diseases and Enemies

Bee Diseases and Enemies

Control and Preventive measures

Unit 4: Bee Economy

Products of Apiculture Industry and its Uses – Honey, Bees Wax, Propolis, Pollen etc.

Unit 5: Entrepreneurship in Apiculture

Bee Keeping Industry – Recent Efforts, Modern Methods in employing artificial Beehives for crosspollination in horticultural gardens

Suggested Readings:

1. Bee Keeping in India – Sardar Singh- KAR, Delhi.
2. Bee keeping in South India – Cherian M.C. &Ramachandran, Govt.Press, Chennai.
3. Handbook of bee keeping – Sharma P.L. & Singh S., Chandigarh.
4. Apiculture – J.Johnson and Jeyachandra, Marthandam, Tamil Nadu.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I Year UG Course effective from the year 2018-2019

Year: I Year Subject Code: U18CES101 Semester: I

Allied - 1 Title: **ENVIRONMENTAL STUDIES**

Credits: 2 Max. Marks. 75

OBJECTIVES	To understand the environment around us and to conserve our nature.
COURSE OUTCOME(S): At the end of course, the students shall able to	
CO1	Describe the available food and natural resources.
CO2	Explain the structure and function of ecosystem
CO3	Elaborate the control of environmental pollution.
CO4	Analyze the social issues of human beings.

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES: NATURAL RESOURCES: Environmental Sciences - Relevance - Significance - Public awareness - Forest resources - Water resources - Mineral resources - Food resources - conflicts over resource sharing - Exploitation - Land use pattern - Environmental impact - fertilizer - Pesticide Problems - case studies.

UNIT-II: ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION: Ecosystem - concept - structure and function - producers, consumers and decomposers - Food chain - Food web - Ecological pyramids - Energy flow - Forest, Grassland, desert and aquatic ecosystem. Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels - Hotspots, threats to biodiversity - conservation of biodiversity - Insitu & Exsitu.

UNIT-III: ENVIRONMENTAL POLLUTION AND MANAGEMENT: Environmental Pollution - Causes - Effects and control measures of Air, Water, Marine, soil, solid waste, Thermal, Nuclear pollution and Disaster Management - Floods, Earth quake, Cyclone and Land slides. Role of individuals in prevention of pollution - pollution case studies.

UNIT-IV: SOCIAL ISSUES - HUMAN POPULATION: Urban issues - Energy - water conservation - Environmental Ethics - Global warming - Resettlement and Rehabilitation issues - Environmental legislations - Environmental production Act. 1986 - Air, Water, Wildlife and forest conservation Act - Population growth and Explosion - Human rights and Value Education - Environmental Health - HIV/AIDS - Role of IT in Environment and Human Health - Women and child welfare - Public awareness - Case studies.

UNIT-V: FIELD WORK Visit to a local area / local polluted site / local simple ecosystem - Report submission

Suggested Readings:

1. KUMARASAMY, K., A.ALAGAPPA MOSES AND M.VASANTHY, 2004. ENVIRONMENTAL STUDIES, BHARATHIDSAN UNIVERSITY PUB, 1, TRICHY

2. RAJAMANNAR, 2004, ENVIRONEMNTAL STUDIES, EVR COLLEGE PUB, TRICHY

3. KALAVATHY,S. (ED.) 2004, ENVIRONMENTAL STUDIES, BISHOP HEBER COLLEGE PUB., TRICHY

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C.ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for First year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

Class	: UG First year B.A.,B.Sc.,&B.Com (C.S)	Semester	: II
Subject Code	: U18FTA201	Title	: Part-I Tamil
Credits	: 4	Max Marks	: 75

OBJECTIVES	தமிழ் மொழியின் இலக்கிய, இலக்கணச் செழுமைகளைப் படைப்புகளின் வழி வெளிக்கொணர்தல்.
COURSE OUTCOME(S)	
CO1	காலம்தோறும் நிலவி வந்த அறம் சார் விழுமியங்களை அடையாளம் காணல். ஆளுமைகளின் அறிமுகத்தால் தன்னம்பிக்கை, விடாமுயற்சி, ஆளுமைத்திறன்களை விளக்கி எடுத்துரைத்தல்.
CO2	சமூகச் சீர்கேடு,பண்டைய அரச வரலாறு போன்றவற்றை விளக்கி,வாசிப்பையும் உச்சரிப்பையும் மேம்படுத்தல். திரைப் பாடல்கள் வழி நாட்டின் நிலைப்பாட்டை எடுத்துரைத்து தனி மனித சுயப் பண்புகளைப் பரிசோதித்தல்.
CO3	காலந்தோறும் தமிழ் இலக்கியங்களில் மாறுபடும் பாடுபொருள். வடிவம் முதலியவற்றை வரலாற்றின் வழி எடுத்துரைத்தல்.

பாடத்திட்டம்

அலகு - 1 நீதி இலக்கியங்கள்

1. திருக்குறள் - செய்ந்நன்றி அறிதல், நட்பு பிரிவாற்றாமை
2. நாலடியார் - தேர்ந்தெடுத்த 10 செய்யுள்
3. விவேக சிந்தாமணி - தேர்ந்தெடுத்த 7 செய்யுள்

அலகு - 2 வாழ்க்கை வரலாறு

1. நவாப். சி. அப்துல் ஹக்கீம்
2. டாக்டர். ஐடா ஸ்கடர்
3. டாக்டர் மு. வரதராசனார்

அலகு - 3 நாடகம்

1. பேரறிஞர் அண்ணா - வழக்கு வாபஸ்
2. ப. சங்கரலிங்கனார் - மானம் பெரிதே!
3. இன்குலாப் - மணிமேகலை (சிறை விடு கதை)

அலகு - 4 திரைத்தமிழ்

1. கண்ணதாசன்
   1. ஆறு மனம் - ஆறு மனமே ஆறு
   2. வாழ்க்கை - வாழ நினைத்தால் வாழலாம்
2. பட்டுக்கோட்டை கல்யாணசுந்தரம்
   3. விவசாயி - கடவுள் எனும் முதலாளி
   4. ஏழை ஏக்கம் - கையிலே வாங்கினேன்
3. வாலி
   5. பரிவு - புத்தன் காந்தி ஏசு
   6. பிரிவு - தரைமேல் பிறக்கவிட்டார்

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அலகு - 5

(அ) இலக்கிய வரலாறு

1. நீதி இலக்கியங்கள்
2. நாடகம் தோற்றமும் வளர்ச்சியும்

(ஆ) திறனறிப் பயிற்சி

1. மரபுப் பெயர்கள் - அறிமுகம்
2. வழூஉச் சொற்கள் - அறிமுகம்
3. பிற மொழிச் சொற்களை நீக்குதல்
4. வடமொழிச் சொற்களை நீக்குதல்
5. விண்ணப்பம் எழுதுதல்

பார்வை நூல்கள்

1	இலக்கியச் சோலை	-	சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு. 2018 சூன் வெளியீடு
2	கொடை வள்ளல் நவாப் சி.அப்துல் ஹக்கீம்	-	அப்துல் காதர் உலகத் தமிழாராய்ச்சி நிறுவனம்,சென்னை முதல் பதிப்பு,2015
3	வெற்றித்தூண்	-	ப.சங்கரலிங்கனார் என்.சி.பி.எச். அம்பத்தூர் சென்னை- 98 முதல் பதிப்பு -2013
4	மணிமேகலை நாடகம்	-	இன்குலாப் குமரன் பப்ளிஸர்ஸ், வடபழனி , சென்னை -26 முதல் பதிப்பு -2005
5	விவேக சிந்தாமணி	-	ஞா.மாணிக்கவாசகன் (உ.ஆ) உமா பதிப்பகம், சென்னை-001 ஆறாம் பதிப்பு – 2010
6	பட்டுக்கோட்டை கல்யாணசுந்தரம் பாடல்கள்	-	என்.சி.பி.எச். அம்பத்தூர் சென்னை- 98 பதினாறாவது பதிப்பு -2009
7	கண்ணதாசன் திரை இசைப் பாடல்கள்	-	கண்ணதாசன், வானதி பதிப்பகம்,தீனதயாளு தெரு, தி.நகர்,சென்னை -17 பன்னிரண்டாம் பதிப்பு – டிசம்பர் 2007
8	தமிழ் இலக்கிய வரலாறு	-	பேரா.மது.ச.விமலானந்தம் அபிராமி பதிப்பகம், இராயபுரம், சென்னை -13 மறு பதிப்பு -2002
9	நற்றமிழ் இலக்கணம்	-	டாக்டர்.சொ.பரமசிவம், பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு, சென்னை -40 பன்னிரண்டாம் பதிப்பு -2012

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for All UG Course [for B.A., B.Sc., & B. Com (C.S.)] effective from the year 2018-2019

Year: I Year Subject Code : U18FUR201 Semester : II

Part - I Title: **URDU - II**

Credits: 4 Max. Marks. 75

MANZOOMATH, GHAZALIATH & TRANSLATION

OBJECTIVES	To enhance students' creative thinking. To trigger the literary skills dormant in them. To train them to advance their Translation Skills.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Explain the multi dimension of human values from Ghazal
CO2	Translate English to Urdu effectively
CO3	Elucidate the social responsibilities from poetry

BOOK PRESCRIBED: "ADAB-E-JAMEEL"

Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

Unit – I

1.NAGHMA-E-HASRATH – Akbar Allahbadi
2.MEER TAQI MEER - Hasthi Apni Habbab Ki Si Hai
3.KHAJA MEER DARD - Tohmaten Chand Apne Zimmz Dhar Chale

Unit – II

1.QAUMI GEETH – Allama Iqbal
2.SHAIK IBRAHIM ZAUQ - Layi Hayath Aaye Qaza Le Chali
3.MIRZA GHALIB - Dil Hi To Hai Na Sang Wa Khisht

Unit – III

1.NISAR MAIN TERI GALIYON KE– Faiz Ahmed Faiz
2.MOMIN KHAN MOMIN - Adam Mein Rehthe
3.JIGAR MURADABADE - Dil Gaya Ronaq Hayath Gayi

Unit – IV

1.WO NABION MEIN RAHMATH LAQAB PANE WALA- Masaddas Hali
2.FIRAQ - Sar Mein Souda Bhi Nahin
3.KAWISH BADRI - Az Sare Nav Fikr Ka Aaghaaz Karna Chahiye
4. A General Passage Translation from English to Urdu

Unit – V

1.TAJ MAHAL – Sahir Ludhyanwi
2.SHAKIR NAITHI - Shahid Maqsood Ek Din Rubaroo Ho Jayega
3.PARVEEN - Chalna Ka Hosala Naye
4.A General Passage Translation from English to Urdu

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all I Year UG Course effective from the year 2018-2019

Year: I Year Subject Code: U18FEN201 Semester: II

Part - II Title: ENGLISH - II

Credits: 4 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	
CO2	
CO3	

UNIT - I **PROSE**

1. The Eternal Silence of These Infinite Crowds — N.C. Chaudhari
2. Comfort — Aldous Huxley
3. The Challenge of Our Time — E.M. Foster
4. Words of Wisdom — Chetan Bhagat

UNIT – II **POETRY**

1. Kubla Khan — S.T. Coleridge
2. I Know Why the Caged Bird Sings — Maya Angelo
3. Punishment in Kindergarten — Kamala Das
4. The Unknown Citizen — W.H. Auden

UNIT - III **SHORT STORIES**

1. A Devoted Son — Anita Desai
2. A Cup of Tea — Katherine Mansfield

UNIT - IV **ONE-ACT PLAY & BIOGRAPHY**

1. Funeral Oration from Julius Caesar — William Shakespeare
2. Biography of Sir Syed Ahmed Khan

UNIT - V **WARM UP**

1. **Lexical Skills:**
    1. One Word Substitutes
    2. Correct Usage of words
    3. Commonly misspelt words
    4. Formation of plurals
2. **Descriptive Grammar:**
    1. Articles and its kinds
    2. Prepositions and its kinds
    3. Pronouns
    4. Kind of Pronouns
    5. Verbs – Transitive and Intransitive Verbs
3. **Traditional Grammar:**
    1. The Tenses- Introduction
       Past Tense

(a) Simple Past Tense
(b) Past Continuous Tense
(c) Past Perfect Tense
(d) Past Perfect Continuous Tense

2. Direct and Indirect Speech

4. Communication Skills (LSRW):

1. Offering a Suggestion
2. Asking For Advice
3. Persuading
4. Complimenting

English for Communication - I

5. **Composition:**

1. Electronic Mail
2. Body Language
3. Facing and Interview
4. Negotiating

1. Group Discussion

English for Communication - I

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I B.Sc. Zoology effective from the year 2018-2019

Year: I Year Subject Code : U18MZL201 Semester : II

Major - 2 Title: **CHORDATA**

Credits: 5 Max. Marks. 75

OBJECTIVES	To understand the systematic and functional morphology of various groups of chordates, their affinities and adaptations to different modes of life.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Describe the features of chordates and prochordates.
CO2	Explain the structure and adaptation of Pisces and Amphibians
CO3	Elaborate the structure of reptiles and aves.
CO4	Analyze the characters and adaptation of Mammals.

UNIT – I

Salient Features and General classification of Phylum Chordata upto orders.

General Characters and affinities of Prochordates –Hemichordata (*Balanoglossus*)-Urochordata (*Herdmania*)-Cephalochordata (*Amphioxus*).

Type study: *Amphioxus*-External morphology-digestive system-respiratory system- circulatory system-excretory system –reproductive system.

General topic: Origin of Chordata

UNIT –II

PISCES

General characters and classification up to orders.

Type study: *Scoliodon* (Shark) - External morphology-digestive system-respiratory system-circulatory system-urinogenital system.

General topic: Migration in fishes.

AMPHIBIA

General characters and classification up to orders.

Type study: *Rana* (Frog)- External morphology-digestive system-respiratory system- circulatory system-excretory system –reproductive system

General topic: Parental care in Amphibia

UNIT – III

REPTILIA

General characters and classification upto orders.

Type study – *Calotes* (Garden Lizard) - External morphology-digestive system-respiratory system-circulatory system-excretory system –reproductive system.

General topic: Structure of Poison apparatus and biting mechanism. Identification of poisonous and non – poisonous snakes of India.

UNIT – IV

AVES

General characters and classification upto orders.

Type study –*Columba* (Common rock pigeon)- External morphology-digestive system-respiratory system- circulatory system-excretory system –reproductive system

General topic: Characters of Archaeopteryx – connecting link. Flight adaptation, Bird Migration

UNIT – V

MAMMALIA

General characters and classification upto orders.

Type study – *Oryctolagus* (Rabbit) - External morphology-digestive system-respiratory system-circulatory system-excretory system –reproductive system.

General topic: Adaptation of Aquatic and flying mammals

Dentition in mammals.

TEXT BOOK

1. Jordan E. L. and P.S. Verma 2013.Chordate Zoology. S. Chand and co., New Delhi.
2. Kotpal R.L. 2017. Chordata and Comparative Anatomy, Rastogi publication, Meerut

Suggested Readings:

1. Ekambaranatha Ayyar, M and T.N Anantha Krishnan 1992, A manual of zoology Vol. II [Chordata]. S. Viswanathan [Printers and publishers] Pvt. Ltd., Madras.
2. Nigam.H.C 1983 Zoology of chordates, Vishal publications, Jalandhar.
3. Waterman, Allyn J. et. al. 1971., Chordate Structure and functions, Mac. Millan and co., New York.
4. Jollie. M. 1968. Chordate Morphology. East west press Pvt. Ltd., New Delhi.
5. Hyman.L.H. 1979. Comparative Vertebrate Zoology. McGraw Hill co. New York.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I B. Sc. Zoology effective from the year 2018-2019

Year: I Year Subject Code: U18ABY201 Semester: II

Allied - 2 Title: **BOTANY – II (ALLIED)**

Credits: 4 Max. Marks. 75

OBJECTIVES	To gain basic knowledge on plant taxonomy and plant physiology
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Recall plant taxonomy
CO2	Describe the embryology of plants
CO3	Describe physiology and ecology of plants
CO4	Elaborate the genetic principles and evolutionary history of plants

UNIT-I: Taxonomy

General outline of Bentham and Hooker's system of classification. Study of the range of characters and economic importance of the following families: Annonaceae, cucurbitaceae, Apocynaceae, Euphorbiaceae and Liliaceae.

UNIT-II: Embryology

Structure of mature anther. Structure of mature ovule and its types. Fertilization.

UNIT-III: Plant Physiology & Plant Tissue Culture

Physiological role of micro and macro elements their deficiency symptoms Photosynthesis - lightreaction - Calvin cycle Respiration - Glycolysis - Kreb's cycle - electron transport system. Growth hormones – Auxins. Tissue culture and its principles.

UNIT-IV: Ecology

Ecosystem - fresh water ecosystem. Environmental pollution. Major pollutants – types of pollution - Air pollution, water pollution, soil pollution - control measures.

UNIT-V: Genetics & Evolution

Mendelism - Monohybrid and dihybrid crosses. Theories of evolution – Lamarckism, Darwinism.

Suggested Readings:

1. Ashok Bendre, A.K. and Pandey P.C. (1975) Introductory Botany. Rastogi Publication Meerut.
2. Ganguly, A.K. and Kumar. N.C. (1971) General Botany Vol. I & Vol. II, Emkay Publication, Delhi.
3. Rev. Fr. Ignacimuthu, S.J. (1975) Basic Biotechnology – Tata Mcraw till publication co., New Delhi.
4. Rao, K.N. Krishnamoorthy, K.V. and Rao. G. (1975) Ancillary Botany. S. Viswanathan Private. Ltd., Chennai.

Syllabus for I B.Sc., Zoology effective from the year 2018-2019

Year: I Year Subject Code: U18AZL201 Semester: II

Allied - 1 Title: **APICULTURE – II (ALLIED II)**

Credits: 4 Max. Marks. 75

OBJECTIVES	To gain advanced knowledge on bee keeping industry
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Describe life history of honey bee
CO2	Describe social organization of bees
CO3	Describe apiary and instruments
CO4	Elaborate the beekeeping as self-employment venture

UNIT – I

Honey bee: systematic position - Species of honey bees - Life history of honeybee - behaviour - Swarming - role of Pheromones

UNIT – II

Bee colony : Castes - Natural colonies and their yields - Types of bee hives -Structure - Location, Care and management

UNIT – III

Apiary : Care and management - Artificial bee hives - Types – Construction of space frames - Selection of sites - Handling – Maintenance.

UNIT – IV

Instruments employed in Apiary : Extraction instruments - Honey -Composition - Uses: Medicinal values – Bees wax and its uses –Economics of Bee culture.

UNIT – V

Diseases: Honey bee diseases and their control methods – Modern methods employing Honey bees for cross pollination in horticultural gardens –

Apiculture as self-employment venture

Suggested Readings:

1. Bee Keeping in India – Sardar Singh- KAR, Delhi.
2. Bee keeping in South India – Cherian M.C. &Ramachandran, Govt.Press, Chennai.
3. Handbook of bee keeping – Sharma P.L. & Singh S., Chandigarh.
4. Apiculture – J.Johnson and Jeyachandra, Marthandam, Tamil Nadu.

Syllabus for I B.Sc. Zoology effective from the year 2018-2019

Year: I Year Subject Code : U18MZLP21 Semester : II

Practical - 1 Title: **INVERTEBRATA AND CHORDATA**

Credits: 3 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Demonstrate the features of invertebrates and chordates.
CO2	Explain the structure and adaptation of invertebrates and chordates

I. MAJOR PRACTICAL

i. Cockroach/Prawn – Digestive system and Nervous system

II. MINOR PARCTICAL

Mouth parts: Cockroach, Honey bee, House Fly and Mosquito
Prawn – Appendages
Shark - Placoid scales

III. SPOTTERS/ SLIDES/ CHARTS/ PHOTO COPIES

a).Study of the following specimens to bring out the adaptations to their respective modes of li

Protozoa : *Entamoeba*
Porifera : Sycon
Coelenterata : *Physalia*
Helminthes : *Taenia solium*
Annelida : Earthworm
Arthropoda : Limulus
Mollusca : *Unio* (Fresh Water Mussel)
Echinodermata : Sea Star
Urochordata : *Ascidian*
Hemichordata : *Balanoglossus*
Cephalochordata: *Amphioxus*
Pisces : Sucker fish (Echeneis)
Amphibia : *Hyla*
Reptilia : Draco
Aves : Pigeon
Mammalia : Bat

b).Study of the following specimens to bring out their biological significance:

Hippocampus, Flying Fish, Bufo, Axolotl larva, Naja naja, Pangolium

c).Study of the following Specimens to relate structure and functions:

Taenia - Scolex

Prawn – Petasma & Thelecom

Honey bee-Sting apparatus

Quill feather of Pigeon

d). Study of the following Specimens to draw labelled Sketch:

Shark-Placoid scales

Hyoid apparatus

Obelia medusa

Bipinnaria Larva.

e).Osteology:

Dentition – Rabbit and Man

Frog/Pigeon-Pectoral and Pelvic girdles

Suggested Readings:

1. Verma. P.S. 2013 A Manual of Practical Zoology INVERTEBRATES Chand & Co, Ltd, Ram Nagar - New Delhi.
2. Verma. P.S. 2013 A Manual of Practical Zoology CHORDATES, Chand & co, Ltd. Ram Nagar – New Delhi.
3. Jayanpal Sinha . 2010 Advanced Practical Zoology, Books & Allied (p) Ltd. No.1. Subham Plaza I Floor, Calcutta.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for I B.Sc. Zoology effective from the year 2018-2019

Year: I Year Subject Code : U18ABYP21 Semester : II

Practical Title: **ALLIED PRACTICAL - BOTANY**

Credits: 2 Max. Marks. 75

OBJECTIVES	To gain advanced knowledge on plant anatomy and physiology
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Analyse the internal anatomy of plants
CO2	Describe physiological experiments

ALLIED PRACTICAL: BOTANY – I & II

1. To make suitable micropreparation, describe and identify materials of Algae, Fungi, Bryophyte, Pteriophyte, Gymmosperm and Angiosperm prescribed.
2. To describe in technical terms, plants belong to any of the families prescribed and to identify the family.
3. To dissect a flower, construct floral diagram and write floral formula.
4. To make suitable micro preparation of the stem, root and leaf of dicot plant and to identify the same giving reasons.
5. To describe simple experimental setup in plant physiology.
6. To describe and identify the micro preparation materials of embryology prescribed.

BOOKS SUGGESTED

1. Pandey, B.P. Taxonomy of Angiosperms S.Chand& Co (p) Ltd. NewDelhi (1999).
2. Vashista, P.C. Taxonomy of Angiosperms, S.Chand& Co. New Delhi, Jullunder (1997).
3. Panday, B.P. (2001) – Plant Anatomy, S. Chand & Company Ltd, NewDelhi.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2000)- The Embryology of Angiosperms (4thEdn.) Vikas Publishing House (P) Ltd., & UBS Publishers Distributores, NewDelhi.
5. Vashistha,B.R.Botany for Degree students,Vol I & II Chand & Co, New Delhi(1995).
6. Srivastava,N.N.Bryophyta. Pradeep Prakashnan,Meerut, India 1996.
7. Vashista,P.C.(1997): Botany for Degree Students –Pteridophyta. S.Chand&Co., NewDelhi.

8. Verma, V. (2007): Text book of Plant Physiology, Ane Books India, New Delhi.
9. Sharma,O.P. (1997) : Gymnosperms, PragatiPrakashan, Meerut, India.
10. Trivedi, P. C. 2000. Plant Biotechnology – Recent Advances: Panima Publishing Corporation.
11. Rao, K. N., Krishnamurthy, K. V. and Rao, G. 1979, Ancillary Botany, Viswanathan private Ltd.

Syllabus for I B.Sc. Zoology effective from the year 2018-2019

Year: I Year Subject Code : U18AZLP21 Semester : II

Part III Title: **ALLIED PRACTICAL - APICULTURE**

Credits: 2 Max. Marks. 75

OBJECTIVES	To gain practical knowledge on Bee keeping
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Identify honey bee and study morphology
CO2	Describe honey extraction and entrepreneurship

- Identification of Honey Bees
- Castes of Honey Bees
- Biology of Bees
- Life cycle of Honey Bees
- Assembling a bee hive
- Beekeeping equipment's
- Harvesting and processing honey

Suggested Readings:

1. Bee Keeping in India – Sardar Singh- KAR, Delhi.
2. Bee keeping in South India – Cherian M.C. &Ramachandran, Govt.Press, Chennai.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for All I Year UG Course effective from the year 2018-2019

Year: I Year Subject Code: U18CSS201 Semester: II

Part - II Title: **SOFT SKILLS**

Credits: 1 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	
CO2	
CO3	
CO4	

UNIT I

1. Ability to listen and document what you have heard
2. Reading and comprehension

UNIT II

3. Ability to read and follow instructions
4. Ability to interpret and transcode information

UNIT III

5. Asking for and responding to information
6. Communication skills with public, fellow employees, supervisors and customers

UNIT IV

7. Spelling and Grammar
8. Ability to fill out a job application

UNIT V

9. Expressing courtesy
10. General and Individual Traits:

(a) Honesty
(b) Reliability
(c) Good Attitude
(d) Common Sense

Syllabus for I Year UG course effective from the year 2018-2019

Year: I Year Subject Code: U18CVE201 Semester: II

Part-IV Title: **VALUE EDUCATION**

Credits: 2 Max. Marks. 75

OBJECTIVES	To understand human values and ethical issues
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Describe the basic concept of human values.
CO2	Explain the structure and responsibility of families
CO3	Elaborate the human ethical relationships.
CO4	Analyze the modern welfare and globalization.

UNIT-I Value Education - Definition - relevance to present day - Concept of Human Values - self introspection - Self-esteem.

UNIT-II Family values - Components, structure and responsibilities of family - Neutralization of anger - Adjustability - Threats of family life - Status of women in family and society - Caring for needy and elderly - Time allotment for sharing ideas and concerns.

UNIT-III Ethical values - Professional ethics - Mass media ethics - Advertising ethics - Influence of ethics on family life - psychology of children and youth - Leadership qualities - Personality development.

UNIT-IV Social values - Faith, service and secularism - Social sense and commitment - Students and Politics - Social awareness, Consumer awareness, Consumer rights and responsibilities - Redressal mechanisms.

UNIT-V Effect of international affairs on values of life/ Issue of Globalization - Modern warfare - Terrorism. Environmental issues - mutual respect of different cultures, religions and their beliefs.

Suggested Readings

1. T. Anchukandam and J. Kuttainimathathil (Ed) Grow Free Live Free, Krisitu Jyoti Publications, Bangalore (1995)
2. Mani Jacob (Ed) Resource Book for Value Education, Institute for Value Education, New Delhi 2002.
3. DBNI, NCERT, SCERT, Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.

4. Daniel and Selvamony - Value Education Today, (Madras Christian College, Tambaram and ALACHE, New Delhi, 1990)
5. S. Ignacimuthu - Values for Life - Better Yourself Books, Mumbai, 1991.
6. M.M.M.Mascaronhas Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993

C. ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for Second year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

Class	: UG Second year B.A.,B.Sc.,&B.Com (C.S)	Semester	: III
Subject Code	: U18FTA301	Title	: Part-I Tamil
Credits	: 4	Max Marks	: 75

OBJECTIVES	தமிழ்மொழியிலுள்ள பண்பு, பழமை, சிறப்பு, வடிவம், இலக்கண முறைமை போன்றவற்றை வெளிக்கொணர்தல்.
COURSE OUTCOME(S)	
CO1	தமிழில் உள்ள காப்பிய இலக்கியங்களையும் கதை வழி வாழ்வியலையும் அறிய வைத்தல். நெடுங்கவிதைகளைப் பயிற்றுவிப்பதன் மூலம் நவீன திறனாய்வு முறைகளில் ஈடுபட துணை நிற்றல்.
CO2	உரைநடையின் அடிப்படைத் திறனையும் பிழையின்றி எழுதும் முறையையும் சமூக உண்மைகளையும் நிலைநாட்டல். இலக்கணத்தைப் பயிற்றுவிப்பதன் மூலம் சிறந்த மொழியாக்க முயற்சிக்கு ஆயத்தப்படுத்தல்.
CO3	காலந்தோறும் தமிழ் இலக்கியங்களில் மாறுபடும் பாடுபொருள். வடிவம் முதலியவற்றை இலக்கிய வரலாற்றின் வழி பயிற்றுவித்தல்.

C. Abdul Hakeem College (Autonomous), Melvisharam.

பாடத்திட்டம்

அலகு–I காப்பியம்

1. சிலப்பதிகாரம் - கனாத்திறம் உரைத்த காதை (முழுவதும்)
2. மணிமேகலை - ஆபுத்திரன் திறம் அறிவித்த காதை (முழுவதும்)
3. சீவக சிந்தாமணி - விமலையார் இலம்பகம் (தேர்ந்தெடுத்த 20 பாடல்கள்)

அலகு–II புதுக்காவியம்

1. பாரதிதாசன் - சஞ்சீவி பர்வதத்தின் சாரல் (முழுவதும்)
2. துறவி - நளவெண்பா - கலி நீங்கு காண்டம் - 'நீங்கினான் கலி'

அலகு–III உரைநடை

1. கலைஞர் மு.கருணாநிதி - சிந்தனையும் செயலும் - அழுக்காறு, ஒழுக்கம்
2. தொ.பரமசிவம் - விடுபூக்கள் - 'சமூக வரலாற்றுப் பார்வையில் திருவிழாக்கள்'
3. சுகி.சிவம் - வாழப் பழகுவோம் - 'மனம் போல வாழ்வு'

அலகு–IV இலக்கணம்

1. **எழுத்து -** முதல், சார்பெழுத்துக்கள் **சொல் -** பகுபத உறுப்புகள், ஆகுபெயர் , வழக்கு **அணி** – உவமை, உருவகம், சொற்பொருள், தற்குறிப்பேற்றம், எடுத்துக்காட்டு உவமை.

அலகு–V (அ) இலக்கிய வரலாறு

1. ஐம்பெருங்காப்பியங்கள், ஐஞ்சிறுகாப்பியங்கள்
2. உரைநடை தோற்றமும் வளர்ச்சியும்

(ஆ) திறனறிப் பயிற்சி

1. அலுவலகக் கடிதங்கள்,
2. அறிக்கை மற்றும் செய்தி எழுதுதல்

பார்வை நூல்கள்

1	இலக்கியச் சாரல்	-	சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு. 2019 சூன் வெளியீடு
2	சிந்தனையும் செயலும்	-	கலைஞர் மு.கருணாநிதி பூம்புகார் பதிப்பகம்,127,பிராகசம் சாலை,சென்னை -18 நான்காம் பதிப்பு -2017
3	விடுபூக்கள்	-	தொ.பரமசிவம் மணி பதிப்பகம், 29ஏ, யாதவர் கீழத் தெரு, பாளையங்கோட்டை. மூன்றாம் பதிப்பு -2016
4	வாழப் பழகுவோம் வாருங்கள்	-	சுகி.சிவம் வானதி பதிப்பகம், 13, தீனதயாளு தெரு, தி.நகர், சென்னை. மூன்றாம் பதிப்பு -2003
5	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு	-	முனைவர் பாக்யமேரி என்.சி.பி.எச்., அம்பத்தூர், சென்னை -98 முதல் பதிப்பு -2008
6	நற்றமிழ் இலக்கணம்	-	டாக்டர்.சொ.பரமசிவம், பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு, சென்னை -40 பன்னிரண்டாம் பதிப்பு -2012

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18FUR301 Semester : III

Language-III Title: **URDU - III**

Credits: 4 Max. Marks. 75

Afsana, Mazmoon nawesi & Mukalama nigari

OBJECTIVES	✓ To arouse interest for Non-Detailed Texts. ✓ To equip them with ample knowledge to pen their own articles. ✓ To instill in them a flair for translation.
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	Explain Practical experience of the Human Life through Afsana.
CO2	Develop creative skill through day to day affairs through Mazmoon Nawesi.
CO3	Categorize conversation through dialogue.

BOOK PRESCRIBED: "ADAB-E-JAMEEL"

Published by

Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

Unit – I

1.KAFAN – Prem Chand

2.JAMUN KA PED – Krishan Chander

Unit – II

1.KHUSH NASEEB – Ali Akbar Amburi
2.DARD KA EHSAS – Ameerunnisa

Unit – III

1.BHOLA – Rajender Singh Bedi
2.NAYA QANOON – Saadath Husain Manto

Unit – IV

1.NOOR-O-NAR – Ali Abbas Hussani
2.AAKHR PAISA BACH HI GAYA – B.S.Ramaiya

Unit – V

1. Guldasta-E-Mazameen-O-Insha Pardazi By **Mohammed Arif Khan**
2. A General Passage for Translation From Urdu To English

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18FHN301 Semester : III

Language-III Title: **HINDI - III**

Credits: 4 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	
CO2	
CO3	

SYLLABUS AND BOOKS PRESCRIBED:

I. MEDIEVAL POETRY: 1. KABIR – DOHE 1 – 8 only
2. SURDAS – PAD 1 – 4 only
3. MEERABAI - PAD 1 & 2 only
4. TULSIDAS - DOHE 1 – 8 only
5. RAHIM – DOHE 1 – 8 only
6. BIHARI – DOHE 1 – 8 only

TEXT: RAKA HINDI KAVYA SANGRAH, RAKA PRAKASHAN, ALLAHABAD

II. DRAMA: ANDHER NAGARI by BHARATENDU HARISCHANDRA
LOKBHARATHI PRAKASHAN, ALLAHABAD.

III. IDIOMS AND PROVERBS: MEANINGS ONLY

IV. APPLIED GRAMMAR:

1. SYNONYMS.
2. ANTONYMS.
3. ONE WORD SUBSTITUTION.
4. TENSE – NO SUB DIVISIONS.
5. CHANGE INTO ABSTRACT NOUNS. (Common Noun TO Abstract Noun & Adjective TO Abstract Noun)

REF 1. VYAVAHARIK HINDI VYAKARAN by Dr. HARDEV BAHRI.
LOKBHARATHI PRAKASHAN, ALLAHABAD.
2. HINDI SHABDA SAMARTHYA by PRABHATH PRAKASHAN
NEW DELHI.

V. HISTORY OF HINDI LITERATURE: GENERAL INFORMATION ABOUT THE PRESCRIBED POETS BELONG TO FIRST THREE PERIODS

1.CHAND BARDAI 2. VIDYAPATHI 3. AMEER KHUSRO
4. JAYASI 5. NANDADAS 6. KESHAV DAS
7. GHANANAD & 8. DEV only

REF: 1. HINDI SAHITYA KA ITHIHAS, RAMCHANDRA SHUKLA, KARVI PRAKASHAN, JAIPUR.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18FEN301 Semester : III

Foundation English-III Title: **ENGLISH - III**

Credits: 4 Max. Marks. 75

OBJECTIVES	➢ To introduce learners to the standard literary texts ➢ To enable them appreciate literature ➢ To help them develop LSRW skills and communicate effectively
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	To introduce world renowned writers to students.
CO2	To introduce world renowned poets to students.
CO3	To make them understand the nuances of short stories.
CO4	To acquaint students with the writings of world renowned personalities.
CO5	To make them understand the fundamentals of English Grammar and Composition.

UNIT - I PROSE

1. Futurology Aldous Huxley

2.	Engine Trouble	R. K. Narayan
3.	I have a Dream	Martin Luther King
4.	Function of Education	J Krishnamurthi

UNIT – II **POETRY**

5.	Poor Girl	Maya Angelou
6.	Solitary Reaper	William Wordsworth
7.	The Tyger	William Blake
8.	My Grand Mother's House	Kamala Das

UNIT - III **SHORT STORIES**

9.	The Last Leaf	O' Henry
10.	Sparrows	K Ahmed Abbas

UNIT - IV **ONE-ACT PLAY& BIOGRAPHY**

11.	The Proposal	Anton Chekov
12.	Father Damien	G. F. Lamb

UNIT - V **WARM UP**

13. Lexical Skills
14. Descriptive Grammar
15. Traditional Grammar
16. Communication Skills (LSRW)
17. Composition

WARM UP

1. Lexical Skills

- Foreign Words and Special Terminology
- Building Vocabulary (Affixes)
- Phrasal Verbs
- Idioms and Phrases

2. Descriptive Grammar

- Adjectives
- Kinds of Adjectives
- Adverb
- Kinds of Adverbs
- Participles, Gerund & Infinitive

3. Traditional Grammar

- The Tenses – Introduction
- Future Tense – Simple Future Tense, Future Continuous Tense, Future Perfect Tense & Future Perfect Continuous Tense.
- Degrees of Comparison

4. Communication Skills (LSRW)

- Expressing Sympathy
- Expressing Gratitude
- Complaining
- Apologizing

5. **Composition**
   - Public speaking
   - Seminar
   - Writing a Memorandum
   - Expansion of Proverbs

Books Prescribed:

HALL OF FAME – III Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com, Mail: info@emeraldpubliser.com

Syllabus for II B. Sc. Zoology effective from the year 2018-2019

Year: II Year Subject Code: U18MZL301 Semester: III

Major-3 Title: **CELL AND MOLECULAR BIOLOGY**

Credits: 3 Max. Marks. 75

OBJECTIVES	To learn the cytological techniques, the structure and functions of various cellular components and to understand molecular basis of cell structure DNA structure and functions.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Recall the structure of cells and cell organelles
CO2	Describe the functional aspects of cell organelles
CO3	Explain the genetic composition of prokaryotic and eukaryotic cells.
CO4	Analyse the structure and functions of Genetic materials

UNIT – I

History of Cell and Molecular Biology – Structure of Prokaryotic and Eukaryotic cell-Principles of microscopes: light and Electron. Cytological techniques - Cell fractionation and Homogenization. Centrifugation-Isolation of Sub-cellular components.

UNIT – II

Cell – Cell theory, Ultra structure and function of animal cell. Structure and functions of Cell Organelles: Plasma Membrane-fluid mosaic model- Endoplasmic reticulum-Ribosomes-Golgi Complex-Lysosomes-Centrioles and Mitochondria.

UNIT – III

Nucleus – Ultrastructure, Composition and Function – Nuclear Membrane and Nucleoplasm and Nucleolus -Structure of normal, giant and polytene chromosomes-Fine structure of Gene -Cistron – Recon, Muton – Gene Regulation – Operon concept – Lac Operon.

UNIT – IV

Cell cycle-stages involved- cell division –types- Amitosis, Mitosis and Meiosis and their significance.

UNIT – V

DNA replication-Conservative and Semi conservative replication- mechanism and enzymes involved. Structure and functions of DNA-types of DNA & RNA.

TEXT BOOK

1. De Robertis, E.D.P. and E.M.F. De Robertis, 2017 . Cell and molecular Biology, 8th Edition, South Asian Edition. Wolters Kluver Publications.

Suggested Readings:

1. Cohn, N.S., 1979, Elements of Cytology, Freeman Book co., New Delhi.
2. Gies, A.C., 1979. Cell Physiology, Saunders co., Philiadelphia, London, Toronto, 609p.
3. Powar, C.B.,1989.Essentials of Cytology, Himalaya Publishing House, Bombay, 368p.
4. Verma, P.S., and V.K. Agarwal, 1995. Cell and Molecular Biology, 8th Edition, S. Chand & Co., New Delhi, 567p.
5. Rastogi. S.C. Cell and Molecular Biology, 2008 2nd Edition, New Age International (p) Ltd., New Delhi.
6. G.P. Jayanthi 2009 Molecular Biology, M.J P Publ. Chennai.

Syllabus for II B. Sc. Zoology effective from the year 2018-2019

Year: II Year Subject Code: U18AZL301 Semester: III

Allied-3 Title: **ECONOMIC ENTOMOLOGY (Allied)**

Credits: 4 Max. Marks. 75

OBJECTIVES	To study the insect pests and their control measures. To study the economic importance of insects as vectors, pollinators, predators & parasites.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Classify insects up to orders
CO2	Recall the beneficial and harmful insects
CO3	Analyze the pest control methods
CO4	Identify insect borne diseases and control measures

UNIT – I

Classification of insects up to order level.

Biology of Butterfly

UNIT – II

Beneficial insects. Mode of life, economic importance and development.

Honey bee

Silk worm (*Bombyx mori*)

Silk worm rearing

UNIT – III

Harmful insects

An account of any one pest of : 1.Rice (*Scirpophaga*)2. Cotton (Boll worm) 3. Coconut (*Oryctes rhinoceros*)

UNIT – IV

Principles and method of pest control – Components of Integrated Pest Management (IPM)

UNIT – V

Insect Vectors- Malaria, Dengue, Chikungunya and human lymphatic Filariasis.

TEXT BOOK

1. Dayib Y. 2018. A text Book of Economic Entomology. Somali Natural Resource Research Centre (SONRREC) 2018

Suggested Readings:

1. B. Vasantharaj David and T. Kumaraswami 1982. Elements of Economic Entomology, Popular book Depot, Chennai.
2. Nayar, K.K., Ananthakrishnan, T.N. and B.V. David, V 1992 General and Applied Entomology Tata McGraw, New Delhi.
3. P.G. Fenemore Manual of Silkworm Rearing. FAO Agricultural Service Bulletin, Rome.

Syllabus for II B. Sc. Zoology effective from the year 2018-2019

Year: II Year Subject Code: U18ACH301 Semester: III

Allied Title: **CHEMISTRY-I (Allied)**

Credits: 4 Max. Marks. 75

OBJECTIVES	Basic knowledge on Metallurgy, Cycloalkanes, Polarising Effects, Stereochemistry, Chemical Kinetics, Catalysis, Photochemistry, VSEPR Theory, Fuels, Osmosis, Nuclear Chemistry, Petroleum Chemistry, Chemistry of Naphthalene, Conductors and Applications wherever necessary are to be taught for I- Semester.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Explain the basic principles of extraction of metals
CO2	Discuss the various concepts of Cycloalkanes, Polarization effects and Stereo isomerism.
CO3	Describe the fundamentals of Kinetics, Catalysis and Photochemistry
CO4	Distinguish the conventional and non-conventional energy resources
CO5	Identify the uses of naphthalene, osmosis and nuclear chemistry

UNIT – I

1.1General Metallurgy - Extraction of Metals - Minerals and Ores- Difference between Minerals and Ores – Minerals of Iron, Aluminum and Copper - Ore Dressing or Concentration of Ores - Types of Ore Dressing- Froth Floatation process, Gravity separation and Magnetic separation.

1.2 Calcination, Smelting, Roasting, Fux, Slag - Definition - Reduction methods – Goldschmidt Aluminothermic process and Carbon Reduction method - Refining of

Metals - Electrolytic, Van Arkel and Zone Refining.

1.3 Ores of Titanium and Cobalt - Extraction of Titanium and Cobalt.

UNIT – II

1. Cycloalkanes - Preparation – Wurtz reaction and Dieckmann's condensation - Properties of Cycloalkanes – Substitution and Ring opening reactions.

2.2 Polarisation - Inductive effect, Mesomeric effect and Steric effect (Acid and Base Strength).

2.3 Stereoisomerism – Types - Cause of Optical Activity – Enantiomers - Diastereomers - Meso form - Optical Activity of Lactic acid and Tartaric acid - Racemisation and Resolution – Definition and Methods - Geometrical isomerism – Definition and example - Maleic and Fumaric acid – Differences.

UNIT – III

3.1 Chemical Kinetics – Rate of a reaction – Definition of Order and Molecularity – Distinction between Order and Molecularity - Derivation of First order rate equation - Half Life Period of first order reaction.

3.2 Catalysis - Catalyst - Autocatalyst - Enzyme catalyst - Promoters – Catalytic poisons – 5 Active Centre - Differences between Homogeneous and Heterogeneous Catalysis - Industrial Applications of Catalysts.

3.3 Photochemistry – Grothus-Draper's law – Stark-Einstein's law - Quantum yield – Photosynthesis - Phosphorescence – Fluorescence.

UNIT – IV

4.1 VSEPR Theory – Hybridisation and Shapes of simple molecules BF3, PCl5, SF6 and XeF6.

4.2 Fuels – Classification of Fuels - Calorific value of Fuels – Water gas, Carbureted Water gas and Producer gas – Composition and Uses - Non-Conventional fuels – Need of Solar Energy - Applications - Biofuels – Oil gas, Natural gas and LPG – Uses.

4.3 Osmosis - Osmotic pressure - Reverse osmosis – Definition - Desalination of Sea water.

UNIT – V

5.1Nuclear Chemistry – Atomic number, Mass number - Isotopes, Isobars and Isotones – Definition and Examples - Definition of Half life period - Nuclear Binding Energy, Mass Defect and N/P ratio -

Nuclear Fission and Nuclear Fusion (Elementary idea) - Applications of Radioisotopes in Medicine, Agriculture and Industries – Carbon Dating.

5.2 Crude Oil - Petroleum - Petroleum Refining - Cracking - Applications of Cracking – Naphthalene – Preparation – Haworth's method – Properties – Oxidation, Reduction and Uses of Naphthalene - Structure of Naphthalene (Structural elucidation not necessary).

5.3 Conductors, Insulators, Semiconductors, N- and P- Type Semiconductors – Definitions and Examples.

Suggested Readings:

1. Inorganic Chemistry - P. L. Soni - Sultan Chand (2006).
2. Inorganic Chemistry - B. R.. Puri, L. R. Sharma and K. C. Kallia – Milestone Publications (2013).
3. Selected Topics in Inorganic Chemistry - W. U. Malik, G. D. Tuli and R. D.Madan - S. Chand Publications (2008).
4. Text Book of Inorganic Chemistry – R. Gopalan, Universities Press – 2012.
5. Text Book of Organic Chemistry - P. L. Soni - Sultan Chand & Sons - 2007.

Syllabus for II B. Sc. Zoology effective from the year 2018-2019

Year: II Year Subject Code: U18SZL301 Semester III

Skill Based-1 Title: **PUBLIC HEALTH AND HYGIENE (SBS-I)**

Credits: 3 Max. Marks. 75

OBJECTIVES	To impart awareness on public health and Hygiene To create knowledge on Health Education.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Explain the importance of nutrition and health
CO2	Describe environmental health hazards
CO3	Analyze various communicable and non-communicable diseases
CO4	Develop new health principles and awareness programmes in India

UNIT – I

Scope of Public Health and Hygiene – nutrition and health – classification of foods – Nutritional deficiencies – Vitamin deficiencies.

UNIT – II

Environment and Health Hazards – Environmental degradation – pollution and associated health Hazards.

UNIT – III

Communicable diseases and their control measures such as Tuberculosis, Polio, Rabies, Leprosy and HIV infection.

UNIT – IV

Non – communicable diseases and their preventive measures such as Hypertension, Coronary Heart Diseases, Diabetes and Obesity. Mental ill-Health and control measures

UNIT – V

Health Education in India – WHO programmes – government and voluntary Organizations and their health service – Precautions first Aid and awareness on sporadic diseases.

TEXT BOOK

1. Park and Park, 1995: Text book of preventive and social medicine – Banarsidas Bhanot Publ. jodhpur- India.

Suggested Readings:

1. Verma, S. 1998: Medical zoology, Rastogi Publ.- Meerut- India
2. Singh, H.s. and Rastogi, P. 2009: Parasitology, Rastogi Publ. India.
3. Dubey, R.C and Maheswari, D.K. 2007: Text Book of Microbiology – S. Chand & co. Publ. New Delhi – India.

Syllabus for II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code: U18NHS301 Semester III

Non-Major - 1 Title: **INDIAN NATIONAL MOVEMENT (NME-I)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To enable the students to perceive how traders of the west became the rulers of the east. To understand the policies and strategies of the East Indian Company and the British empire. To evaluate the contribution of the freedom fighters
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Understand the Early Nationalists, socio – Religion Reformers in 19th Century and demonstrate the Political Associations.
CO2	Think Critically about nationalism and its Impact on our Freedom History. Integrate these regarding analyzes the Salient Features of Moderates.
CO3	Understand the Phase of Extremist and their role and Contributions.
CO4	State the role of Gandhiji in the Freedom Movement.

CO5	Evaluate the sacrifices of our freedom fighters and understand the nation hood.

UNIT - I

Early Nationalist Response : Vellore Mutiny of 1806 - Causes, Course, Causes for Failure, Nature and Impact of the Revolt of 1857 – Socio-Religious Reform Movements in 19 th Century - Brahmo Samaj, Raja Ram Mohan Roy - Devendrnath Tagore – Kesav Chandira Sen - Arya Samaj, Dayanada Saraswathi - Prarthana Samaj -Ramakrishna Mission , Swami Vivekananda-Theosophical Society, Annie Besant - Aligarh Movement, Sir Sayed Ahamad Khan - Political Associations In Bengal, Bombay and Madras upto 1885

UNIT - II

Institutionalization of the National Movement: Factors responsible for the formation of the Indian National Congress – Objectives, Origin of the Congress – A.O. Hume - Moderate Phase (1885-1905) – Early Congressman – Gopala Krishna Gokhale - their nature, ideology, politics and leaders

UNIT – III

Extremist Phase (1905-1916): Partition of Bengal – Swadeshi Movement – Bala Gangadhara Tilak - Formation of Muslim Leaque - Surat Split – Swadeshi and Boycott Movement – Bengal Reunion and Transfer of Capital – India in First World War –Home Rule Movement - Lucknow Pact – August Declaration .

UNIT – IV

Emergence of Gandhiji: Rowlatt Act – Jalianwala Bagh Massacre – Khilafat Movement and Non-Cooperation Movement – Boycott of council , Court , School and colleges - Swarajya Party – Simon Commission – Nehru Report – Civil Disobedience Movement – Round Table Conferences – Gandhi Irwin Pact – Poona Pact - Government of India Act 1935

UNIT - V

Final Phase: Provincial Governments – Lahore Resolution – Concept of Pakistan - Subas Chandra Bose and Azad Hind Fauj - INA - Individual Satyagraha - The Cripps Mission – Quit India Movement – Cabinet Mission – Transfer of Power - Mountbatten Plan – Partition – Indian Independence Act - Independence

Books for Reference

1. Tara Chand: History of Freedom Movement Vol. I-IV, Publications Division, Govt. of India, 1983.
2. SumitSarkar: Modern India, 1885 - 1947, MacMillan India Ltd, Madras, 1986.
3. Bipin Chandra and Others: India's Struggle for Independence, Penguin Books, 1990.
4. Majumdar, R.C., & Chopra, P.N., Main Currents of Indian History, Sterling Publishers Pvt Ltd, New Delhi, 1979

5. Desai, A.R., Social Background of Indian Nationalism
6. Grover, B.L., A New Look at Modern Indian History, S.Chand & Company Ltd, New Delhi, 2009.

Syllabus for II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code: U18NKS301 Semester III

Non-Major - 1 Title: **FUNDAMENTALS OF MARKETING (NME-I)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To acquaint the students with the basics of marketing to make them understand the consumer behaviour and buying motives.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Identify an idea about marketing and its functions.
CO2	Describe the characteristics of products.
CO3	Categorize the pricing and its strategies.
CO4	Estimate the various methods of sales forecasting.
CO5	Formulate the services marketing.

UNIT: I INTRODUCTION TO MARKETING

Market – Meaning, Definition - Classifications of Market – Marketing - Meaning, Definition Importance of marketing – Functions of Marketing – Marketing Concept - Marketing Mix

UNIT: II PRODUCTS

Products – Classifications of products – Product characteristics – Product life cycle – Product mix - Product mix Strategy.

UNIT: III PRICING

Pricing – Objectives, pricing policies and procedures, Factors influencing pricing decision – Kinds of Pricing – Pricing Strategy.

UNIT: IV SALES FORECASTING

Sales Forecasting – Various methods of Sales Forecasting – Limitation of Sales Forecasting – Distribution Channel – Meaning – Importance – Merits and Demerits – Types of Intermediaries.

UNIT: V MARKETING OF SERVICE

Service Marketing - Concept of Service - Characteristics of Services Marketing - Future of the Service Sector - The mix elements in Service Product - Pricing for Services - Promoting Services - Physical Evidence.

Text books:

1. Slanton , W.J. “Fundamentals of Marketing”,

Reference books:

1. Rajan Nair, “Marketing Management”, Sultan Chand & Sons, 01-Jan-1995
2. RamaswanyNamakumari, “Marketing Management”, Macmillan India Limited, 2002.
3. Philp Kotler, “Marketing Management”, Pearson Education, 06-Jan-2015.

Syllabus for II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code: U18NMA301 Semester III

Non-Major - 1 Title: **BASIC MATHEMATICS (NME-I)**

Credits: 2 Max. Marks. 75

OBJECTIVES	This Course aims to study about the basic elementary concepts of Mathematics for Non-Major Students.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Apply Venn diagram to verify certain laws in set theory
CO2	Identify the given statement is tautology or not.
CO3	Calculate the inverse of a non singular matrix

UNIT-I: Sets

Definition - Subsets - Power sets - Equality of sets - Finite and Infinite sets - Set operations - De-Morgan’s laws - Distributive tables - Cartesian products.

UNIT-II: Number system

Binary, Octal, Hexadecimal numbers - conversion from one system to another system - addition and subtraction - one's complement.

UNIT-III: Symbolic logics

Logical statements - connectives - truth tables - tautologies operations - groups – (problems and simple properties only).

UNIT-IV: Matrices

Definition - types of matrices - operations on matrices - adjoint and inverse - applications - solving non-homogeneous equations.

UNIT-V: Determinants

Definition - properties (without proof) - application of determinants - Cramer's rule for the solution of a system of equations.

Reference Books

1. Dr.M.K.Venkataraman & others, "Discrete mathematics and structures", The National Publishing Company, Madras.
2. Trembly J.P and Manohar.R "Discrete Mathematical Structures with applications to computer science" Tata McGraw - Hill Pub., Co., Ltd. New Delhi 2003.
3. Richard Johnsonbaugh, "Discrete Mathematics" fifth Edn., Pearson Education Asia, New Delhi 2002.
4. V.Vijayendran "Digital Fundamentals" S.Viswanathan Printers & Publishers Pvt. Ltd.
5. T.K.Manicavachagom Pillay & Others, "Algebra", Volume II, S.Viswanathan Printers & Publishers Pvt. Ltd.

Syllabus for II Year UG Course effective from the year 2018-2019

Year:	II Year	Subject Code:	U18NPH301	Semester	III
Non-Major - 1	Title:	**BASIC PHYSICS (NME-I)**			
Credits:	2			Max. Marks.	75

OBJECTIVES	To understand the basics of physics in day to day life and its importance through its applications.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	To know about Newton's laws and their application in Washing machine
CO2	To know about absorption of heat, its transfer and their domestic applications.
CO3	To know about the principles involved in sound, light and its common
CO4	applications
CO5	To know about natural calamities in Geophysics view, Medical physics and their common applications.

UNIT – I : MECHANICS **6 Hours**

Newton's laws and their importance – Definitions of Work, Power, Energy and their units – Principle and working of Centrifuge - Washing Machine and its functional parts.

UNIT – II : HEAT **6 Hours**

Thermometry - Celsius and Fahrenheit scales - Variation of boiling point with pressure – Principle and working of Pressure cooker – Refrigerator – Air Conditioner – Principle and their capacities

UNIT – III : ACOUSTICS AND OPTICS **6 Hours**

Acoustics - applications and its importance - Ultrasonics – SONAR and its applications – Power of lens – Long sight and short sight – Microscope, Telescope, Binocular and their basic principles and applications.

UNIT – IV : GEO PHYSICS AND MEDICAL PHYSICS **6 Hours**

Earthquake – Richter scale – Thunder and lightning – Lightning arrestors – Principles and Medical applications of X-rays, Ultrasound, Computerised Tomography, Magnetic Resonance Imaging in medicine and their importance.

UNIT – V : RADIOWAVES AND COMMUNICATION **6 Hours**

Electromagnetic spectrum–Radio Waves–Basics of AM and FM Transmission and Reception–Mobile communication fundamentals–Importance of Satellites.

Books for study:

1. The Learner's Series – Everyday Science – Published by INFINITY BOOKS, New Delhi.
2. The Hindu speaks on Science, Vol I & II, Kasturi & Sons, Chennai.

Books for Reference:

1. Fundamentals of Physics, D. Hallidy, R. Rensick and J. Walker, 6th Edition, Wiley, NY (2001).
2. Physics, Vols I, II, III , D. Halliday, R. Rensick and K.S. Krane, 4th Edition, Wiley, New York (1994).
3. The Feymann Lectures on Physics Vols, I, II, III , R.P. Feynmann, R.B. Leighton & M. Sands, Narosa, New Delhi (1998).

Syllabus for II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code: U18NCH301 Semester III

Non-Major - 1 Title: **CHEMISTRY IN DAILY LIFE - I (NME-I)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To introduce students to a breadth of ways in which chemistry impacts every aspect of modern life, from the food we eat to the clothes we wear, the way we communicate and work, the way we keep ourselves healthy and how we diagnose and treat those who aren't. Chemistry's role in our everyday life and how chemistry will impact on people's lives in the future.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Understand the basic concepts in chemistry.
CO2	Explore the knowledge of comestics and their hazardous in our daily life.
CO3	Gain the knowledge of water analysis and their treatment methods.
CO4	Understand the concepts of pH and buffer action in our daily life.

CO5	Learn about the nature of food, food sources, balanced diet, various adulterants and their governing laws.

UNIT: I Basic Concepts in Chemistry

Elementary ideas of Atoms, elements, Atomic mass and Molecular mass. Isotopes, isobars and isotones. Methods of expressing concentration: Weight percentage, molality, molarity, normality and ppm.

UNIT: II Cosmetics

General formulation, preparation and toxicology of different types of cosmetics - Tooth paste, Shampoos, Hair dyes, lipstick, nail polish, perfumes, deodorants, Shaving cream Talcum powder, soaps and detergents.

UNIT-II Water Analysis

Sampling of Water for analysis - Chemical Substances affecting Potability - Colour, Turbidity, Odour, Taste, Temperature, pH and Electrical Conductivity. Purification of water Hard and soft water. Analysis of pollutant water by COD and BOD.

UNIT-IV Acid - Base balance

Definition classification, preparation properties and uses of acids and bases of Neutralisation reactions in everyday life. Indicators pH and their biological significance of pH; Buffer solutions – Importance of buffer in living system.

UNIT-V Food and Nutrition

Carbohydrates, Proteins, Fats, Minerals and Vitamins, definitions, sources and their physiological importance - balanced diet.

Adulterants in milk, ghee, oil, coffee powder, tea, asafoetida, chilli powder, pulses and turmeric powder - identification. Food laws, Safety and Standards.

REFERENCES:

1. Chemical Process Industries (4th Edition) R. Norris Shreve Joseph A.Brink,Jr.
2. Perfumes, Cosmetics and Soaps W.A.Poucher (Vol.3) Environmental Chemistry A.K.De.
3. B. Sreelakshmi, Food Science, New Age International, New Delhi, 2015.
4. Shashi Chowla; Engineering Chemistry, Danpat Rai Publication.
5. B.K. Sharma; Industrial Chemistry. Goel Publishing House, Meerut, 2003.
6. C.N.R. Rao; Understanding Chemistry, Universities Press.
7. M.K. Jain and S.C. Sharma; Modern Organic Chemistry, Vishal Pub. Co., Jalandhar, 2009.
8. V.R.Gowariker; N.V. Viswanathan and J. Sreedhar; Polymer Science, 2nd edn., New Age, New Delhi, 2015.
9. P.C. Pall; K. Goel and R.K. Gupta; Insecticides, Pesticides and Argobased Industries.
10. Singh, K., Chemistry in Daily Life; Prentice Hall of India, New Delhi, 2008.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for II Year UG Course effective from the year 2018-2019

Year:	II Year	Subject Code:	U18NCM301	Semester	III
Non-Major - 1	Title:	**BUSINESS MANAGEMENT AND COMMUNICATION (NME-I)**			
Credits:	2			Max. Marks. 75	

OBJECTIVES	
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	
CO2	
CO3	
CO4	
CO5	

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code: U18NTA301 Semester III

Non-Major - 1 Title: **BASIC TAMIL I (NME-I)**

Credits: 2 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	
CO2	
CO3	
CO4	
CO5	

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code: U18NUR301 Semester III

Non-Major - 1 Title: **FUNCTIONAL URDU I (NME-I)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To popularize Urdu among Non-Urdu Knowing students. To introduce them to the basic infrastructure of Urdu. To train them in exact pronunciation of Urdu words.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Explain the primary lessons in Urdu.
CO2	Develop the ability to form simple sentences.
CO3	Identify the proficiency in Urdu Calendar.

Unit I

Urdu alphabet

Reading & Writing practice in Urdu

Unit II

Word completion,
Pronunciation, Connecting words.

Unit III

Vowels,
Prepositions & Urdu Numerals.

Unit IV

Formation of Simple Sentences.

Unit V

Conversation &
Urdu Calendar (Week days and Months).

C. Abdul Hakeem College (Autonomous), Melvisharam.

C.ABDUL HAKEEM COLLEGE (Autonomous), Melvisharam

Syllabus for Second year B.A.,B.Sc.,&B.Com (C.S) effective from the year 2018-2019

Class	: UG Second year B.A.,B.Sc.,&B.Com (C.S)	**Semester**	: IV
Subject Code	: U18FTA401	**Title**	: Part-I Tamil
Credits	: 4	**Max Marks**	: 75

OBJECTIVES	செவ்வியல் தமிழ் இலக்கிய வடிவங்கள், விழுமியங்கள், இலக்கண அமைப்பியல் போன்றவற்றை அறியச் செய்தல்.
COURSE OUTCOME(S)	
CO1	சங்க கால சமூகவியலையும் வாழ்வியல் அறங்களையும் அறிய வைத்தல். இடைக்காலத்தில் சமூக அமைப்பினையும் இலக்கிய வடிவ மாறுதல்களையும் விளக்கி எடுத்துரைத்தல்.
CO2	கவிதைகள் வெளிக்காட்டும் சம கால பதிவுகளை எளிமையாக வெளிக்கொணர்தல். இலக்கணத்தைப் பயிற்றுவிப்பதன் மூலம் சிறந்த மொழியாக்க முயற்சிக்கு ஆயத்தப்படுத்தல்
CO3	படைப்பிலக்கியப் பயிற்சி வழி படைப்புத்திறனை மேம்படுத்தல்.

பாடத்திட்டம்

அலகு–I சங்க இலக்கியம்

1. குறுந்தொகை - பாடல் எண்கள் : 32, 40, 58, 69, 79, 176 (6 பாடல்கள்)
2. ஐங்குறுநூறு - குறிஞ்சி – கபிலர் - கிள்ளைப்பத்து (முதல் 6 பாடல்கள்)
3. புறநானூறு - பாடல் எண்கள் : 86, 182, 188, 196, 277, 279 (6 பாடல்கள்)

அலகு–II சிற்றிலக்கியம்

1. குற்றாலக் குறவஞ்சி - குற்றால மலை வளம் (6 பாடல்கள்)
2. முக்கூடற் பள்ளு - பள்ளியர் ஏசல் (8 பாடல்கள்)
3. முத்தொள்ளாயிரம் - சேரன் -3 சோழன் -3 பாண்டியன் - 3 (9 பாடல்கள்)

அலகு–III கவிதை

1. கவிஞர் மீரா - ‘ஏற்றம் காண்போம்’
2. கவிஞர் முடியரசன் - ‘துயில்’
3. கவிஞர் தாராபாரதி - ‘காற்றுக்குப் புதிய திசை காட்டு’

அலகு–IV இலக்கணம்

யாப்பு- எழுத்து – அசை – சீர் - தளை – அடி – தொடை

அலகு–V(அ) இலக்கியவரலாறு

1. சங்க இலக்கியங்கள்
2. சிற்றிலக்கியங்கள்'

(ஆ) திறனறிப் பயிற்சி

1. படைப்பிலக்கியம் - கட்டுரை , கதை ,– பயிற்சி வழங்கல்

C. Abdul Hakeem College (Autonomous), Melvisharam.

பார்வை நூல்கள்

1	இலக்கியச் சாரல்	-	சி.அப்துல் ஹக்கீம் கல்லூரி வெளியீடு. 2019 சூன் வெளியீடு
2	மீரா கவிதைகள்	-	கவிஞர் மீரா அகரம் பதிப்பகம்,1,நிர்மலா நகர்,தஞ்சாவூர் -7 முதல் பதிப்பு -2002
3	முடியரசன் கவிதைகள்	-	கவிஞர் முடியரசன் பாரி நிலையம், 29ஏ, பிராட்வே, சென்னை -1 முதல் பதிப்பு -1954
4	கவிஞாயிறு தாராபாரதி கவிதைகள்	-	மலர் மகன் (தொ.ஆ) இலக்கிய வீதி, 149- பூங்கா சாலை அண்ணா நகர் மேற்கு - விரிவு சென்னை. -01 முதல் பதிப்பு -2007
5	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு	-	முனைவர் பாக்யமேரி என்.சி.பி.எச்., அம்பத்தூர், சென்னை -98 முதல் பதிப்பு -2008
6	நற்றமிழ் இலக்கணம்	-	டாக்டர்.சொ.பரமசிவம், பட்டுப் பதிப்பகம், 1269, 32-ஆம் தெரு அண்ணாநகர் மேற்கு, கம்பர் குடியிருப்பு, சென்னை -40 பன்னிரண்டாம் பதிப்பு -2012

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18FUR401 Semester : IV

Language-IV Title: **URDU - IV**

Credits: 3 Max. Marks. 75

DRAMA, RUBAYIATH & History of Urdu literature

OBJECTIVES	To promote students' knowledge of various literary genres like Drama. To effectuate their caliber to pen poems of their own. To motivate them to build lively conversations.
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	Develop to excel in the art of reading Drama.
CO2	Describe social responsibilities from Rubai.
CO3	Explain the emerge as exponents of competitive exams.

BOOK PRESCRIBED: "ADAB-E-JAMEEL"

Published by Dept. of Urdu, C. Abdul Hakeem College, Melvisharam.

Unit – I

1. Darwaza kholdo-Krishan Chander [First Quarter]
2. Agoosh-E- Lihad Mein Jab Ke Sona Hoga - Anees
3. Gulshan Mein Phiroou – Anees
4. Meer Taqi Meer

Unit – II

1. Darwaza kholdo-Krishan Chander [Second Quarter]
2. Ghaflat Kihansihse Aah Bharna Acha –Akber Allahbadi
3. Har Ek Se Sun Naye Fasana Ham Ne – Aker Allahbadi
4. Mirza Ghalib

Unit – III

1. Darwaza kholdo-Krishan Chander [Third Quarter]
2. Gunche Teri Zindagi Pe Dil Halth Hai -- Josh
3. Gunche Teri Zindagi Pe Dil Halth Hai – Josh
4. Sir Syed Ahmed Khan

Unit – IV

1.Darwaza kholdo-Krishan Chander [Last Quarter]
2.Muflis Hun Na Dowlath Hai Na Sermaya Hai --Amjad
3.Is Naam Ki Zindagi Mein Kuch Jaan To Ho – Amjad
4.Moulana Hali
5. Prem Chand

Unit – V

1. Roshan Nahi Karta Jala Dethe Hain –Asghar Vellori
2. Dhoonda Tho Kithabon Mein Sadaqath Na Mili –Asghar Vellori
3. Akber Ilahbadi
4. Allama Iqbal
5. Krishan Chandar

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18FHN401 Semester : IV

Language-IV Title: **HINDI - IV**

Credits: 4 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	
CO2	
CO3	

SYLLABUS AND BOOKS PRESCRIBED:

I.MODERN POETRY:

1.YASHODHARA KA ANUTHAP *by* MYTHILISHARAN GUPTA

2. JAAGO JEEVAN KE PRABHAT *by* JAYSHANKAR PRASAD

3. ABHI NA HOGA MERA ANTH *by* NIRALA.

4. SUKH - DUKH *by* PANTH

5. VE MUSKATE PHOOL NAHI *by* MAHADEVI VARMA

6. TOOTA PAHIYA *by* DHARMAVEER BHARATHI

TEXT: RAKA HINDI KAVYA SANGRAH, RAKA PRAKASHAN, ALLAHABAD

II. (a) APPLIED GRAMMAR:

1. CORRECTION OF SENTENCES.

2. TATSAM to TADBHAV & VICE VERSA

REFERENCE BOOKS:

1. VYAVAHARIK HINDI VYAKARAN *by* Dr. HARDEV BAHRI.
LOKBHARATHI PRAKASHAN, ALLAHABAD.

III. HISTORY OF HINDI LITERATURE: GENERAL INFORMATION ABOUT THE PRESCRIBED POETS/WRITERS FROM MODERN PERIOD. 1. AGNEYA 2. SREELAL SHUKLA 3. NAGARJUN. 4 DINKAR 5. MANNU BHANDARI. 6. JAGDISH GUPTA 7. DHOOMIL 8. BACHCHAN.

IV. COMPUTER / INTERNET TERMINOLOGY – PRESCRIBED TERMS FROM ENGLISH TO HINDI.

V. TRANSLATION: SENTENCES FROM ENGLISH TO HINDI.
Passages only

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18FEN401 Semester : IV

Language-IV Title: **ENGLISH - IV**

Credits: 4 Max. Marks. 75

OBJECTIVES	To encourage a critical consciousness through a study of some popular themes and social concerns. To develop writing skills through an introduction to the major genres such as poetry, short story, essay and drama. To encourage reading through an introduction to some popular writers
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	To introduce world renowned writers to students.
CO2	To introduce world renowned poets to students.
CO3	To make them understand the nuances of short stories.
CO4	To acquaint students with writings of world renowned personalities.
CO5	To help them excel in Grammar and Composition

UNIT - I **PROSE**

1. The Rule of the Road — A. G. Gardiner
2. Forgetting — Robert Lynd
3. Mobile and Mixed Up — Anil Dharker
4. Water: The Elixir of Life — Sir C. V. Raman

UNIT - II **POETRY**

1. The Lotus — Toru Dutt
2. The Highway Man — Alfred Noyes
3. Character of a Happy Life — Henry Wotton
4. Refugee Mother and Child — Chinua Achebe

UNIT - III **SHORT STORIES**

1. Two Gentlemen of Verona — A. J. Cronin
2. The World Renowned Nose — V. M. Basheer
3.

UNIT - IV **ONE-ACT PLAY& BIOGRAPHY**

1. Love at First Sight – The Tempest — William Shakespeare
2. My Friend, Albert Einstein — Holfman

UNIT - V **WARM UP**

1. Lexical Skills
2. Descriptive Grammar
3. Traditional Grammar
4. Communication Skills (LSRW)
5. Composition

C. Abdul Hakeem College (Autonomous), Melvisharam.

WARM UP

1. **Lexical Skills**
   - Common Errors in English
   - Formation of Words
   - Spelling and Sound: Introduction to Phonetics
   - Vowels and Consonants

2. **Descriptive Grammar**
   - Conjunction and its Kinds
   - Interjection
   - Regular and Irregular Verbs
   - Modals and Auxiliaries Verbs

3. **Traditional Grammar**
   - Question Tags
   - Simple, Compound & Complex Sentences
   - Figures of Speech (a) Metaphor (b) Irony (c) Oxymoron (d) Personification (e) Simile

4. **Communication Skills (LSRW)**
   - Phoning
   - Offering Help
   - Asking for Information
   - Making Appointment

5. **Composition**
   - Designing a Resume
   - Writing Covering Letters for Resume
   - Preparing Agenda for Meetings
   - Writing Minutes of Meetings

Books Prescribed:

HALL OF FAME – IV Board of Editors, Published by Emerald publishers, Egmore, Chennai – 600 008: www.emeraldpublishers.com, Mail: info@emeraldpubliser.com

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II B.Sc., Zoology effective from the year 2018-2019

Year:	II Year	Subject Code :	U18MZL401	Semester :	IV

Major-IV Title: **GENETICS AND BIOTECHNOLOGY**

Credits: 3 Max. Marks. 75

OBJECTIVES	To know the principles of genetics and to study the application of scientific and engineering processes in the processing of materials by biological agents.
COURSE OUTCOME(S): On completion of the course, students will be able to	
CO1	Explain the theories of classical genetics and blood group inheritance in man
CO2	Describe the genetic variation through mutation
CO3	Analyze the animal breeding experiments.
CO4	Apply the various Genetic engineering principles

GENETICS

UNIT – I

Introduction to genetics – Basis of Mendelian Inheritance and Mendelian Laws – Interaction of Genes – Complementary Factors, Inhibitory and lethal Factors – Atavism. Multiple Alleles – Blood Groups and their Inheritance in Human.

UNIT – II

Linkage and crossing over – Drosophila – Morgan's Experiments - Cytological Evidence for Crossing Over. Sex determination and sex linkage in Drosophila and Man.

UNIT – III

Mutation – chromosomal Aberrations – examples from Human – applied Genetics – Animal Breeding – Heterosis, Inbreeding, Out breeding, Out Crossing, Hybrid Vigour.

BIOTECHNOLOGY

UNIT –IV

Tools of Genetic Engineering – Enzymes, Linkers and Adaptors, Cloning vectors [plasmids, pBr322, Phage λ, Cosmids and phagemids].

Techniques of Genetic Engineering - recombinant DNA Technology and gene Cloning in prokaryotes [cDNA and Genomic Library].

UNIT – V

PCR- blotting techniques.

Application of Recombinant DNA technology in Medicine & Agriculture.

Genetically Modified Organisms (GMO's)

TEXT BOOK

1. Verma, P.S. and V.K. Agarwal, 2010 Genetics, 9th revised edition, S. Chand & Co, New Delhi – 110 055.
2. Satyanarayana, U. Chakrapani, U., 2008. Biotechnology. Books & Allied Ltd., India

Suggested Readings:

1. Gunther S. Stent, 1986. Molecular Genetics. Macmillan Publishing Co Inc. 773pp.
2. Higgins H, Best GJ and Jones J [1996] Biotechnology – Principles and application Black well scientific Publication Oxford London.
3. Gupta P.K. Elements of Biotechnology [2001] Rastogi publication, Meerut.
4. Dubey 2006 Text Book of Biotechnology S. Chand & co. New Delhi.
5. Gardener. 1991. Principles of Genetics. 8th edition. John wiley & sons Inc. New York. Chichester, Brisbane, Toronto, Singapore.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II B. Sc., Zoology effective from the year 2018-2019

Year: II Year Subject Code : U18AZL401 Semester : IV

Allied - IV Title: **ECONOMIC ENTOMOLOGY - II**

Credits: 4 Max. Marks. 75

OBJECTIVES	To study the basic concepts of insecticides and various pest control measures
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Describe the importance of insects in ecology
CO2	CO2: List the beneficial and non-beneficial insects
CO3	CO3: Explain insect interaction with their environment, other species and humans
CO4	CO4: Classify insecticides and various pest control measures

UNIT – I

Insects and their interrelations with environments, insects as Pollinators, parasitoids, Scavengers and weed killers.

UNIT – II

General classification of insecticides – based on mode of action, contact, systemic, fumigants, nerve and stomach poison. Biological control.

UNIT – III

Basic principles of insecticide formulation and their application in pest control – plant protection appliances used – working and application.

UNIT – IV

Precautions in handling of insecticides. Pesticides and environmental pollution.

UNIT – V

Assessment of insect pest population, Estimation of insect pest damage – Insect pest outbreak and surveillance.

TEXT BOOK

1. B. Vasantharaj David and T. Kumaraswami 1988. Elements of Economic Entomology. Popular book Depot, Chennai.

Suggested Readings:

1. Nayar, K.K., AnanthaKrishnan, T.N. and B.V. David 1992 General and applied Entomology Tata McGraw, New Delhi.
2. P.G. Fenemore, Alka Prakash 1997 Allied Entomology, Wiley Eastern Ltd. New York.
3. Wigglesworth J.B., 1994. Insect physiology, Chapman and Hall, London.
4. Temphare D.B., 1984. A Text Book of Insect Morphology, physiology and Endocrinology. S. chand and co., New Delhi.

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Syllabus for all II Year B.Sc., Zoology effective from the year 2018-2019

Year: II Year Subject Code : U18ACH401 Semester : IV

Allied - IV Title: **CHEMISTRY - II**

Credits: 4 Max. Marks. 75

OBJECTIVES	Basic knowledge on Coordination Chemistry, Industrial Chemistry, Carbohydrates, Aminoacids, Proteins, Electrochemistry, Paints and Pigments, dyes, Vitamins, Medicinal Chemistry, Corrosion and Applications wherever necessary are to be taught for II- semester.
COURSE OUTCOME(S): At the end of course the students shall able to	
CO1	Define the basics of Coordination, VSEPR and Interhalogen Compounds
CO2	Describe the properties of carbohydrates and proteins
CO3	Outline the basics of electrochemistry and buffer solutions
CO4	Interpret the applications of Paints, Fertilizers, Pesticides, etc.
CO5	Explain the actions of Drugs and Anaesthetics

UNIT – I

1.1 Coordination Chemistry - Nomenclature of Coordination Compounds – Ligands, Central Metal Ion and Complex Ion – Definition and Examples – Coordination Number - Werner's Theory of Coordination Compounds - Chelates - Functions and Structure of Haemoglobin and Chlorophyll.

1.2 Industrial Chemistry - Fertilisers and Manures – Biofertilisers - Organic Manures and their importance - Role of NPK in plants - Preparation and Uses of Urea, Ammonium Nitrate, Potassium Nitrite and Super Phosphate of Lime.

1.3 Contents in Match Sticks and Match Box - Industrial making of Safety Matches – Preparation and Uses of Chloroform, DDT, Gammexane and Freons.

UNIT – II

2.1 Carbohydrates - Definition and Examples - Classification – Oxidation and Reduction Reactions of Glucose - Structure of Glucose (Structural elucidation not necessary) - Uses of Starch - Uses of Cellulose Nitrate and Cellulose Acetate.

2.2 Amino Acids – Definition and Examples - Classification of Amino Acids - Preparation - Gabriel Phthalimide Synthesis – Properties – zwitterion and Isoelectric point - Structure of Glycine.

2.3 Proteins – Definition - Classification of Proteins based on Physical properties and Biologcal functions - Primary and Secondary Structure of Proteins (Elementary Treatment only) – Composition of RNA and DNA and their Biological role – Tanning of Leather - Alum (Aluminum chloride tanning) - Vegetable tanning – Chrome Tanning.

UNIT – III

3.1 Electrochemistry - Electrolytes – Definition and Examples – Classification - Specific and Equivalent Conductance - their determination – Variation of Specific and Equivalent conductance with Dilution – Ostwald's Dilution Law and its Limitations.

3.2 Kohlrausch's Law - Determination of Dissociation Constant of weak Electrolytes using Conductance measurement - Conductometric titrations.

3.3 pH – Definition and pH determination by indicator method - Buffer solutions -Buffer action - Importance of buffers in the living systems.

UNIT – IV

4.1Paints - Components of Paint – Requisites of a Good Paint - Pigments – Classification of Pigments on the basis of Colour – Examples - Dyes – Definition – Chromophores and Auxochromes – Examples - Colour and Dyes – Classification based on Constitution and Application – Examples.

4.2 Vitamins – Definition – Classification – Water Soluble and Fat Soluble – Occurrence - Biological Activities and Deficiency Diseases caused by Vitamin A, B, C, D, E and K - Hormones – Definition and Examples – Biological Functions of Insulin and Adrenaline.

4.3 Chromatography - Principles and Applications of Column and Paper chromatography- Rf value.

UNIT – V

5.1 Drugs - Sulpha Drugs – Preparation and Uses of Sulphapyridine and Sulphadiazine - Mode of Action of Sulpha Drugs - Antibiotics - Uses of Penicillin, Chloramphenicol and Streptomycin - Drug Abuse and Their Implication - Alcohol – LSD.

5.2 Anaesthetics - General and Local Anaesthetics - Antiseptics - Examples and their Applications - Definition and One Example each for Analgesics, Antipyretics, Tranquilizers, Sedatives - Causes, Symptoms and Treatment of Diabetes, Cancer and AIDS.

5.3 Electrochemical Corrosion and its Prevention – Electroplating – Applications.

Suggested Readings:

1. Organic Reaction Mechanisms - Gurdeep Chatwal- Himalaya Publishing House.
2. A Text Book of Organic Chemistry K. S. Tewari, N. K. Vishol, S. N. Mehrotra-Vikas Publishing House – 2011.
3. Principles of Physical Chemistry - B. R. Puri, Sharma and Madan S. Pathania, Vishal Publishing Company – 2013.
4. Text Book of Physical Chemistry - P. L. Soni, O. P. Dharmarha andU. N. Dash - Sultan Chand & Co – 2006.
5. Understanding Chemistry – C. N. R. Rao, Universities Press – 2

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Syllabus for all II B. Sc., Zoology effective from the year 2018-2019

Year: II Year Subject Code : U18SZL401 Semester : IV

SBS-II Title: **POULTRY FARMING (SBS-II)**

Credits: 3 Max. Marks. 75

OBJECTIVES	To create knowledge on Modern Poultry Farming and to encourage as a self-employment venture.
COURSE OUTCOME(S): After successful completion of the course, students shall be able to	
CO1	Describe the importance and rationale of poultry farming
CO2	Classify various breeds of chicken across the world
CO3	Produce various methodologies to formulate feed for management of poultry in large scale farms
CO4	Analyze various factors responsible for outbreak of diseases in poultry farms
CO5	Construct a poultry house of his own to become an entrepreneur

UNIT – I

Poultry-definition-types of poultry-fowls-ducks-Quails. Scope and importance of poultry-Status of Poultry in India and World. Classification of fowls based on colour, comb and meat.

UNIT – II

External structure of a male and female fowl-identification of sex-External morphology of variety of fowls: American Class (Rhode Island Red and Plymouth Rock), Asiatic class (Brahma), English Class (Sussex, Australop and Orpington), Mediterranean class (Leghorn and Minorca)

UNIT – III

Feeding poultry –Feed Preparation- Feeing equipments-Management of Egg Layers – Management of Broilers in large scale farms.

UNIT – IV

Poultry diseases: Causative agent and prevention of Viral, Bacterial, Fungal, protozoan and Parasitic diseases. Vaccination chart for fowls.

UNIT – V

Construction and Management of modern poultry farms – care taking of egg layers-care during winter and summer-Progressive plans to promote poultry as a self-employment venture.

TEXT BOOK

1. Sreenivasiah P.V., 2014. Text Book of Poultry Science. Write & Print Publishers, India

Suggested Readings:

1. Jull Morley, A. 1971: Poultry Husbanry, Tata –McGraw Hill Publ. Co New Delhi – India.
2. Sastry, Thomas and Singh, 1982: Farm Animals Management and Poultry production – Vikas Publ. co. New Delhi – India.
3. Harbans Singh and Earl.N. Moore, 1982: Livestock and poultry production – prentice hall India Publ. Co., New Delhi – India.
4. Banarjee, G.C. 1986: Poultry, Oxford – IBH publ. co., New Delhi – India.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18NHS401 Semester : IV

NME-II Title: **CIVIL SERVICES AND OTHER COMPETITIVE EXAMINATIONS (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To enable the students to perceive how Competitive Examinations in India. To understand the policies and strategies of the Central Services Union Public Service Commission, Railway Recruitment Board. To evaluate the contribution of the Subjects of Study for TNPSC Examinations Group I and Competitive Examination Preparation Tips
COURSE OUTCOME(S): Students are able to	
CO1	Understand the Union Public Service Commission and its Competitive Examinations in India.
CO2	Study the jobs, in central Government Organizations and how to apply Competitive Examinations.
CO3	Narrate the Kind of Tamil Nadu Public Service Examination Group Wise.
CO4	Understand and Recognize the Subject of Study for the TNPSC Examinations
CO5	Visualize the future Plans and describe the Competitive Examination Preparation Tips

UNIT – I

Competitive Examinations in India: Introduction – Civil Services – Preliminary and Main Examinations – Government Employment in Other Services – Examination Patterns

UNIT - II

Central Services: Union Public Service Commission – Railway Recruitment Board – Defence Examinations – LIC/GIC Examinations – Staff Selection Commission Examinations – UGC / NET Examinations – Bank Examinations

UNIT – III

TNPSC: Tamil Nadu Public Services Commissions – Combined Civil Services Examinations, Group I – Combined Civil Services Examinations, Group II (Interview Posts) – Madras High Court Service Examinations – District Educational Officers Examinations – Village Administrative Officers Examinations – Other Technical Examinations

UNIT – IV

Subjects of Study for TNPSC Examinations Group I: – Mathematics – Physics – Chemistry – Biology – Zoology – History – Sociology – Computer Science – TNPSC Group II, III and IV: General Knowledge – Politics – History – Current Affairs – National Movement – Science – Geography – Economics and Business – Intelligent Quotient –General Tamil – Perusing Previous Years Question Papers

UNIT – V

Competitive Examination Preparation Tips: Motivation – Active Learner – Organizing Studies – Time Management – Reading Newspapers, Magazines, Subject and Reference Books – Writing Examinations at Home – Good Handwriting Practice – Avoiding Stress – Perusing Previous Years Question Papers

Books for Reference

1. Dr. Divya S Iyer, Path Finder: Civil Services Main Examination, DC Books Pvt Ltd, New Delhi

2. Edgar Thorpe, The Pearson CSAT Manual 2013: Civil Services Aptitude Test for the UPSC Civil Services Preliminary Examination, New Delhi

3. S.A. Majid, Special Current Affairs for Civil Services Examination, Kalinjar Publications, New Delhi

4. SanjivVerma, The Indian Economy : For UPSC and State Civil Services Preliminary and Main Examinations, Unique Publications, New Delhi

5. Veerasekaran, TNPSC Group II, Kizhakku Publishers, Chennai

6. Veerasekaran, TNPSC Group III, Kizhakku Publishers, Chennai

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18NKS401 Semester : IV

NME-II Title: **PROJECT MANAGEMENT (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To initiate students into the starting of a project and to help them execute the project successfully. To give theoretical knowledge for planning and management in the review of the projects undertaken.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Identify the basic concept of projects.
CO2	Demonstrate the project survey and idea generation.
CO3	Appraise the project with different selection criteria.
CO4	Categorise the project finance and its sources.
CO5	Design the project formulation and preparation of project report.

UNIT-I INTRODUCTION

Meaning – Definition – Characteristics of Project – Classification of Projects - Project life cycle.

UNIT-II PROJECT SURVEY

Project Ideas and Innovation - Sources of Project Idea - Need Analysis - Market Research - Market Planning.

UNIT-III PROJECT SELECTION

Selection of project: Criteria for Selection of Project - Site selection - Factors Influencing Location of Project – Locational Advantages and Disadvantages - Choice of technology and appropriate Technology.

UNIT-IV PROJECT FINANCE

Sources of Finance – Shares and Debentures-types and features - Public Deposits - Bank Credit – Institutional Supports: ICICI, IDBI, IFCI.

UNIT-V PROJECT FORMULATION AND INCENTIVES

Project Formulation: Meaning – Importance of Project formulation - Feasibility Analysis – Project Report - Incentives – Subsidy, Bounty and Concession – Need for Incentives – State and Central incentives – Taxation benefit.

Text book:

1. C.B. Gupta, “Project management”, A.P.H Publishing Corporation, New Delhi, 2000.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all II Year UG Course effective from the year 2018-2019

Year: II Year Subject Code : U18NMA401 Semester : IV

NME-II Title: **FOUNDATION MATHEMATICS FOR COMPETITIVE EXAMINATIONS (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	This Course aims to prepare the students for various competitive examinations.
COURSE OUTCOME(S): At the end of the course students will be able to	
CO1	Apply the concept of ratio, proportion in real life situations.
CO2	Identify the gain, loss of a person and more than two persons in real life situations.
CO3	Calculate time, distance, work and simple interest, compound interest.

UNIT-I

Ratio and proportions.

UNIT-II

Percentages.

UNIT-III

Profit and loss, discounts.

UNIT-IV

Simple and compound interest**.**

UNIT-V

Time, Distance and Work.

Reference Book

1. Quantitative Aptitude - R.S. Aggarwal (S.Chand & Co. - New Delhi 2008).
2. Course in Mental Abilities and Quantitative Aptitude for Competitive Examinations - Edgar Thorpe (Tata McGraw - Hill Pub., Co., Ltd. New Delhi – II Edn.,).

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: II Year Subject Code : U18NPH401 Semester : IV

NME-II Title: **BASIC PHYSICS II (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To understand the basics of physics in day to day life and its importance through its applications.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	To know about properties of matter and its applications
CO2	To get knowledge on basic principles of electricity and magnetism and applications of electromagnets
CO3	To acquire knowledge in the content areas of nuclear and particle physics
CO4	To apply principles of physics to astronomical objects
CO5	Know about the conventional and non-conventional sources like Nuclear energy and Ocean thermal energies.

UNIT – I: Properties of Matter **6 Hours**

Strain and stress, elastic limit, Hooke's law – Surface tension – Capillary action – Flow of liquids and gases – Streamline and turbulent flow – Laws of floatation and its applications – Bernoulli's theorem and its applications – Viscosity and its applications.

UNIT – II: Electricity and Magnetism **6 Hours**

Voltage, Current, Resistance, and Ohm's Law, Electrical Power – Difference between AC and DC – Single Phase and Three Phase supply – Transformers and its applications – Dia, Para and Ferromagnetic materials – Properties of magnetic materials.

UNIT – III: Modern Physics **6 Hours**

Atom models evolution up to Bohr atom model (Qualitative description only) – Nucleons and other elementary particles – Fundamental Forces of Nature – Radioactivity and its applications – Crystalline and Amorphous Solids – examples, comparison and applications.

UNIT – IV: Astrophysics **6 Hours**

Introduction – Solar system – Inner planets and outer planets – Kepler's laws of Planetary motion – Constituents of stars – birth and death of stars, stellar explosions, white dwarfs, neutron stars, pulsars, and black holes – Expansion of universe.

UNIT – V: Energy Physics **6 Hours**

Energy sources – Conventional and Non Conventional – Types – Hydro and Thermal – Coal Oil, Gas and their importance – Green house effect – Nuclear energy, Solar energy, Wind energy.

Books for Study:

1.Properties of Matter, R Murugeshan, 5th Edition, S. Chand Publishing, New Delhi.

2. Electricity and Magnetism, R Murugeshan, 10th Edition, S. Chand Publishing, New Delhi.

3. Modern Physics, R Murugeshan and Kiruthiga Sivaprasath, 18th Edition, S. Chand Publishing, New Delhi.

4. Mechanics & Mathematical Physics, R Murugeshan, 3rd Edition, S. Chand Publishing, New Delhi.

Books for Reference:

1. Fundamentals of Physics, D. Hallidy, R. Rensick and J. Walker, 6th Edition, Wiley, NY (2001).
2. https://en.wikipedia.org/wiki/Solar_System.
3. https://en.wikipedia.org/wiki/List_of_Indian_satellites.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: II Year Subject Code : U18NCH401 Semester : IV

NME-II Title: **CHEMISTRY IN DAILY LIFE II (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To introduce students to a breadth of ways in which chemistry impacts every aspect of modern life, from the food we eat to the clothes we wear, the way we communicate and work, the way we keep ourselves healthy and how we diagnose and treat those who aren't. Chemistry's role in our everyday life and how chemistry will impact on people's lives in the future.
COURSE OUTCOME(S): At the end of the course students will be able to	
CO1	Acquire fundamental knowledge in preparations of cosmetics and their toxicology.
CO2	Gain the knowledge of using the chemicals as food in day to day life.
CO3	Understand the usage of chemicals as food production agents and their hazardous.
CO4	Understand the importance of plastics and their pollution.
CO5	Learn about the man made materials and their importance.

UNIT-I Common Drugs

Antibiotics, Antipyretics, Analgesics, Anti-inflammatory agents, Sedatives, Antiseptics, disinfectants, Antihistamines, Tranquilizers, Hypnotics and Antidepressant drugs - Definition, Examples, uses and side effects.

UNIT-II Colour chemicals and Food additives

Definition- Preservatives, Food colours - permitted and non-permitted. Artificial sweeteners, Emulsifying agents, Antioxidants. Artificial Sweetening agents – Saccharin – Cyclamate – Advantages and Disadvantages.

UNIT-III Chemicals in food production

Fertilizers used in natural sources - Fertilizers urea, NPK and Super phosphates need - uses and hazards. Biofertilizers and Pesticides – definition and examples.

UNIT-IV Plastic technology

Plastics, Polythene, PVC, Bakelite, Polyesters, Resins and their Applications. Natural Rubber - Synthetic rubbers - Vulcanisation - Preparation and its Applications. Environmental hazards of plastics.

UNIT – V Man made Materials

Colour chemicals – pigments and dyes, classification, examples and applications.

Raw materials and manufacturing process of Cement, and glass.

REFERENCES:

1. Chemical Process Industries (4th Edition) R. Norris Shreve Joseph A.Brink,Jr.
2. Perfumes, Cosmetics and Soaps W.A.Poucher (Vol.3) Environmental Chemistry A.K.De.
3. B. Sreelakshmi, Food Science, New Age International, New Delhi, 2015.
4. Shashi Chowla; Engineering Chemistry, Danpat Rai Publication.
5. B.K. Sharma; Industrial Chemistry. Goel Publishing House, Meerut, 2003.
6. C.N.R. Rao; Understanding Chemistry, Universities Press.

7. M.K. Jain and S.C. Sharma; Modern Organic Chemistry, Vishal Pub. Co., Jalandhar, 2009.
8. V.R.Gowariker; N.V. Viswanathan and J. Sreedhar; Polymer Science, 2nd edn., New Age, New Delhi, 2015.
9. P.C. Pall; K. Goel and R.K. Gupta; Insecticides, Pesticides and Argobased Industries.
10. Singh, K., Chemistry in Daily Life; Prentice Hall of India, New Delhi, 2008.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: II Year Subject Code : U18NCM401 Semester : IV

NME-II Title: **GENERAL COMMERCIAL KNOWLEDGE (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): At the end of the course students will be able to	
CO1	
CO2	
CO3	
CO4	
CO5	

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: II Year Subject Code : U18NTA401 Semester : IV

NME-II Title: **BASIC TAMIL II (NME-II)**

Credits: 2 Max. Marks. 75

OBJECTIVES	
COURSE OUTCOME(S): At the end of the course students will be able to	
CO1	
CO2	
CO3	
CO4	
CO5	

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year:	II Year	Subject Code :	U18NUR401	Semester :	IV
NME-II	Title:	**FUNCTIONAL URDU II (NME-II)**			
Credits:	2			Max. Marks. 75	

OBJECTIVES	To advance students' knowledge of Urdu. To impart training in Urdu Composition. To brief them about Urdu poetry.
COURSE OUTCOME(S):	
CO1	Explain the Urdu equivalents of important Nomenclature.
CO2	Describe the patriotism and social responsibilities from poetry.
CO3	Translate simple words from English to Urdu.

Unit I

Basics of Urdu Grammar

Unit II

Names of flowers, fruits,
birds, colours & Vegetables.

Unit III

Composition
(A short paragraph consisting of four or five simple sentences).

Unit IV

Two simple poems.

Unit V

Translation
(Technical terms and a passage).

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: II Year Subject Code : U18MZLP41 Semester : IV

Practical-2 Title: **CELL AND MOLECULAR BIOLOGY, GENETICS AND BIOTECHNOLOGY**

Credits: 3 Max. Marks. 75

COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Demonstrate the principles and working mechanisms of microscopes
CO2	Elaborate the mechanism of mitosis.
CO3	Demonstrate Biotechnology techniques

Cytometry

Compound microscope, camera Lucida, Stage ad Ocular Micrometers

Blood Smear Preparation – Differential count of W.B.C. Total count of RBC using Haemocytometer.

Total count of WBC using Haemocytometer.

Slide Preparation

Mounting of Buccal Epithelium.

Mitosis in onion root tip squash.

Study of prepared slides of histology

Columnar Epithelium, Ciliated epithelium, Glandular Epithelium.

Cartilage T.S., Bone T.S.,

Cardiac Muscle, Striated muscle, Non Striated muscle,

Neuron, Male germ cell, Female germ cell.

GENETICS

Squash preparation of Salivary glands of chironomous larva.

Male & Female identification.

Observation of common Mutants of Drosophila (any three).

Human Blood Grouping analysis.

BIOTECHNOLOGY Study of prepared slides, Models or specimen.

Escherichia coli, Bacteriophage, Plasmid. Demonstration of P.C.R technique: Southern blot, Electrophoresis.

Visit to Biotechnology lab and Report – compulsory.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year:	II Year	Subject Code :	U18AZLP41	Semester :	IV
Allied Practical -2	Title:	**ECONOMIC ENTOMOLOGY (Allied Practical-II)**			
Credits:	2			Max. Marks. 75	

OBJECTIVES	To develop practical knowledge in the field of Entomology.
COURSE OUTCOME(S): After successful completion of the course, students shall be able to	
CO1	Describe the various types of insect metamorphosis
CO2	Demonstrate the digestive system and mouth parts of insects
CO3	Identify the diverse plant protection appliances, pests that damages agricultural crops and vectors

I. MAJOR PRACTICAL

Dissection of digestive system of any one of the available specimens (Silkworm/Mylabris/Grasshopper/Cockroach)

Model / chart – Draw and comment

Life cycle of Holometabolous, Hemimetabolous and Ametabolous Insects [Atleast one example in each]

II. MINOR PRACTICAL

Mounting

Mouth parts –Mosquito (Male and Female), House fly and Honey bee

Sting apparatus of Honeybee.

III. SPOTTERS

Insecticide formulations and plant protection appliances.

Insect pests of agricultural Importance –Stem borer, Fruit borer, Root borer and Pod Borer [one example each], Citrus Butterfly, Rhinocerous beetle, Brinjal spotted beetle, Grasshopper, Army worm, Mango nut weevil and parasitoid.

Insect Vectors of Medical Importance – Mosquito, Housefly, cockroach, Louse and Bed Bug

IV. RECORD

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Year: II Year Subject Code : U18AZLP41 Semester : IV

Part-III Title: **ALLIED CHEMISTRY PRACTICAL**

Credits: 2 Max. Marks. 75

COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Determine the amount of unknown substances by volumetric analysis.
CO2	Develop skills required to analyze organic compounds qualitatively.

VOLUMETRIC ANALYSIS

1. Estimation of HCl – Standard sulphuric acid.

2. Estimation of Borax - Standard Sodium Carbonate.

3. Estimation of NaOH – Standard Oxalic Acid.

4. Estimation of FeSO4 – Standard FAS.

5. Estimation of Oxalic acid – Standard FeSO4.

6. Estimation of FAS – Standard Oxalic Acid.

7. Estimation of Oxalic acid – Standard Oxalic Acid.

8. Estimation of Fe2+ using Diphenylamine / N- Phenyl Anthranilic acid as indicator.

ORGANIC ANALYSIS

Systematic Analysis of Organic Compounds containing One Functional Group and Characterisation by Confirmatory Tests.

Reactions of Aromatic Aldehyde, Carbohydrates, Mono and Dicarboxylic acids, Phenol, Aromatic Primary Amine, Amide and Diamide.

REFERENCE BOOKS

1. Inorganic Chemistry - P. L. Soni - Sultan Chand (2006).
2. Inorganic Chemistry - B. R.. Puri, L. R. Sharma and K. C. Kallia – Milestone Publications (2013).
3. Selected Topics in Inorganic Chemistry - W. U. Malik, G. D. Tuli and R. D.Madan - S. Chand Publications (2008).
4. Text Book of Inorganic Chemistry – R. Gopalan, Universities Press – 2012.
5. Text Book of Organic Chemistry - P. L. Soni - Sultan Chand & Sons - 2007.
6. Advanced Organic Chemistry - Bahl and Arun Bahl - Sultan Chand and Co. Ltd – 2012.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: II Year Subject Code : U18FURP41 Semester : IV

PRACTICAL URDU

Language-IV Title:

Credits: 4 Max. Marks. 75

OBJECTIVES	To monitor students' career prospects through their academic expertise. To train them to be fit enough for jobs in Software Sector. To groom them to be adepts at using various Fronts and Inpage Tools.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Demonstrate to learn Urdu typing and its soft technique.
CO2	Apply Urdu Inpage Software for Urdu Typing
CO3	Design for publication in Urdu.

URDU SOFTWARE

[Practical & Viva-voce]

Prescribed Text Book "URDU SOFTWARE" Publish by NCPUL, New Delhi

LINGUSTIC WITH PRACTICAL (Job Oriented Urdu Software Programme)

Unit I

Introduction to Urdu Software

Practical

Unit II

Key Board and its kinds

Practical

Unit III

Types of Fonts

Practical

Unit IV

Text Alignment

Practical

Unit V

Inpage & Unicode Tools

Practical

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: III Year Subject Code : U18MZL501 Semester : V

Major-5 Title: **BIOSTATISTICS AND BIOINFORMATICS**

Credits: 5 Max. Marks. 75

OBJECTIVES	The course is aimed at introducing the students to understand the concepts of statistics in biology the field of Bioinformatics.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Recall the theory behind fundamental Bio statistical methods.
CO2	Define basic concepts of probability and statistics
CO3	Describe widely used bioinformatics databases.
CO4	Apply and interpret bioinformatics and statistical analyses with real biological data.

UNIT – I

Definition and scope of Biostatistics

Collection of data: Primary and Secondary data – methods of collection and sampling procedures

Variables: discontinuous, discrete and non-discrete, continuous

Classification of data

Presentation of data: tabulation

Diagrams and graphs: line diagram, bar diagram, pie diagram, histogram, frequency polygon and frequency curve.

UNIT – II

Measures of central tendency: Mean, median and mode.

Measures of Dispersion: Range, Quartile deviation, mean deviation, Standard deviation and Standard error.

(Computations needed for all the above measures based on biological data).

UNIT – III

Testing of Hypothesis - Null and Alternative hypothesis

Test of significance-Students t-test and Chi square test

(Computations needed for both the tests based on biological data)

UNIT- IV

Bioinformatics – definition – Literature databases- NCBI – Pubmed, GeneBank and Medline

Protein and Nucleic acid sequence databases – PIR, Swiss – Prot, DDBJ

Structure Databases PDB, SCOP & CATH,

Structure visualization tools - RasMol, Swiss PDB viewer.

UNIT- V

Pairwise Sequence Alignment –Scoring Matrices - PAM and BLOSUM- Z-score-Dot Plot – local and global alignment.

Database searching – FASTA and BLAST.

Multiple sequence alignment- Clustal W- Phylogenetic Tree – PHYLIP.

TEXT BOOK

1. Jerold H. Zar. 2012. Bio statistical analysis [2nd edition] .Prentice Hall International edition
2. Arthur. M. Lesk, Introduction to Bioinformatics, Oxford University Press, New Delhi, 2003

Suggested Readings:

1. Gupta S.P: Statistics. 2013. S. Chand and Co., New Delhi.
2. Baxevanis, A and Outllette. Bioinformatics- a practical guide to the analysis of genes and proteins,Willy – Interscience, Hoboken, NJ. USA 2005..
3. Higggins D.and Taylor, W. 2000 Bioinformatics: Sequence, Structure and Databanks. Oxford University Press, New Delhi.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: III Year Subject Code : U18MZL502 Semester : V

Major-6 Title: **DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY**

Credits: 5 Max. Marks. 75

OBJECTIVES	To study the ontogenesis and understand the Immunological principles.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Relate with various stages of developing embryo
CO2	Describe the initial development al procedures involved in Amphioxus, frog and chick
CO3	Apply the concept in the field of Reproductive Technology
CO4	Analyze the basic immunological principles

UNIT – I

Historical perspective and basic concepts of Developmental Biology

Gametogenesis: Spermatogenesis and Oogenesis-significance of egg and sperm.

Fertilization: types, mechanism, morphological changes in gametes and block to polyspermy, & theories of fertilization.

Parthenogenesis-natural and artificial.

UNIT – II

Cleavage: Types of eggs, patterns and planes of cleavage

Cleavage in *Amphioxus* and frog.

Fate map: Fate map of *Amphioxus* and frog.

Morphogenetic movements - Gastrulation in *Amphioxus* and frog.

Organogenesis: Development of brain and heart in frog.

UNIT – III

Embryonic adaptations; Embryonic membranes and their functions in chick – placentation in mammals.

Family welfare - contraception (Tubectomy and Vasectomy).

Reproductive technology: Artificial insemination-cryopreservation-IVF-Embryo transfer – Test tube babies – amniocentesis -Bioethics.

UNIT- IV

Immunity: Types of immunity – Innate and acquired, Passive and active. Lymphoid organs: Primary lymphoid organs - Thymus, Bone marrow, Bursa of Fabricius, Tonsil, Peyer's patches; Secondary Lymphoid organs – Spleen and Lymph node.

UNIT-V

Immunoglobulins: Structure, functions and biological properties of immunoglobulin classes. Interaction of antigen and antibody. Auto immune diseases. Immune cells-T-cell, B -Cell and Macrophages.

Immunoprophylaxis – Immunization schedule for children.

Immuno deficiency – AIDS.

TEXT BOOK

1. Balinsky, B.I., Fabian, B.C., 2012Introduction to embryology (Indian Student Edition) Cengage Learning India; 5 edition.
2. Kuby.J.1999, Immunology.W. H. Free man and Co., New York.

Suggested Readings:

1. Berril& Corp. Developmental Biology. McGraw Hill Book Company, MC., New York.
2. Jayaraj M S.An Introduction to embryology.VeerBalaRastogi Publication.
3. Verma, P.S., V.K. Agarwal and Tyagi, 1995.Chordate embryology. S. Chand & co., New Delhi.
4. Roitt. I.M 2000 Essential Immunology, Blackwell Scientific Publishers.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Major-7 Title: **ANIMAL PHYSIOLOGY**

Credits: 5 Max. Marks. 75

OBJECTIVES	To study the basic principles and physiology of various organs and organ systems of Animals.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Recall dietary needs and digestion principles
CO2	Describe the structure and functions of different organ systems
CO3	Apply the concept in the field of thinking and brain development
CO4	Relate the hormonal interactions in animals

UNIT – I

Basic composition of nutrients: carbohydrates – proteins – lipids – vitamins & minerals

Balanced diet & BMR.

Structure and functions of gastrointestinal system.

Role of enzymes in food digestion

Food absorption & malnutrition.

UNIT – II

Structure and function of human lung - transport of respiratory gases, respiratory pigments - respiratory quotient – oxygen debt – anaerobiosis.

Types of heart in animals - Structure and functions of heart with reference to Man- blood pressure – electrocardiogram (ECG).

Mechanism of blood coagulation

UNIT – III

Excretion – kinds of excretory products – ammonotelic, urecotelic and ureotelic animals- Structure of mammalian kidney - Mechanism of urine formation.

Osmoregulation - euryhaline Vs stenohaline, osmoconformers Vs osmoregulators

Osmoregulation in Crustaceans and fishes.

Muscular system: Muscle tissue types-ultra structure of skeletal muscle, mechanism of muscle contraction.

Cori cycle – Theories of muscle contraction.

UNIT – IV

Nervous tissue – components of CNS- Structure and function of Neuron – types of neurons. Nerve impulse – Synapse – Synaptic transmission of impulses – Neurotransmitters. Receptors – Photo and phono receptors – Physiology of vision and mechanism of hearing.

UNIT- V

Sexual reproduction: in mammals (man). Male sex hormones - female sex hormones. Menstural cycle, Menopause, Pregnancy & Parturition.

Endocrinology: Structure, function and hormones of pituitary, thyroid, parathyroid, adrenal, islets of Langerhans.

TEXT BOOK

1. Sambasivaiah, Kamalakara rao and Augustine Chellappa 1990.A Text book of Animal Physiology and Ecology, S. Chand & co., Ltd., New Delhi – 110 055.

Suggested Readings:

1. Randall, D., Burggren, W., French, K., 1997**.** Eckert Animal Physiology: Mechanisms and Adaptations. (4th Edition) W. H. Freeman and Company New York.
2. Parameswaran, Anantakrishnan and Ananta Subramanyam, 1975. Outlines of Animal Physiology,S. Viswanathan [printers& Publishers] Pvt., Ltd.
3. William S. Hoar, 1976. General and Comparative Physiology, Prentice Hall of India Pvt., Ltd., NewDelhi.110 001.
4. Wood.D.W, 1983, Principles of Animal Physiology 3rd Ed.
5. Prosser,C.L. Brown, 1985, Comparative Animal Physiology, Satish Book Enterprise, Agra – 282 003.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all III B.Sc., Zoology effective from the year 2018-2019

Year: III Year Subject Code : U18EZL501 Semester : V

Elective-1 Title: **BIOINSTRUMENTATION (Elective-I)**

Credits: 3 Max. Marks. 75

OBJECTIVES	To learn about the various biological instruments and their function available locally.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Describe the principles of Microscopy
CO2	Demonstrate the principles of centrifugation and chromatography
CO3	Apply the concept in the field of Animal Cell culture
CO4	Analyze the genetic materials

Unit – I:

Microscope: Structure and functions of Light, Phase contrast, Fluorescence and Electron Microscope. Principle and Applications of pH meter, Colorimeter and Spectrophotometer.

Unit – 2:

Chromatography: Principle and applications of Thin layer, Paper, Gas liquid and High performance liquid chromatography. Centrifugation: types, Principle and applications. Separation of Subcellular Organelles by Ultracentrifugation.

Unit – 3:

Cytological techniques: Principle and applications of flowcytometry, Autoclave, Laminar air flow, CO_2 incubator, Inverted Microscope. Design of animal tissue culture laboratory. Cryotechnique – Cryopreservation of animal cells. Histological technique – Principle of tissue fixation, Microtomy, staining and mounting.

Unit – 4:

Electrophoresis: Principle and applications of Agarose gel electrophoresis and SDS-PAGE. Principle and Applications of Immunoelectrophoresis, ELISA and Immunochromatography.

Unit – 5:

Principle and Applications of Southern, Northern and Western Blotting. Principle and applications of Polymerase chain reaction (PCR) & RFLP.

TEXT BOOK

1. Keith Wilson and John Walker, 2010. Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press.

Reading materials

1. Boyer, Modern Experimental Biochemistry, Benjamin 1993.

2. P. Palanivelu, Analytical Biochemistry and separation techniques: Tulsi book centre, Lung complex 1st floor, Madurai – 625001.
3. Cooper. The Cell-A Molecular Approach. ASM 1997.
4. R. Ian Freshney: Culture of Animal Cells: A Manual of Basic Technique and Specialized applications. Publisher**:** Wiley-Blackwell; 6th Revised edition (2 February 2011).

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all III B.Sc., Zoology effective from the year 2018-2019

Year: III Year Subject Code : U18EZL502 Semester : V

Elective-1 Title: **ENDOCRINOLOGY (Elective-I)**

Credits: 3 Max. Marks. 75

OBJECTIVES	The course envisages information on endocrine system with emphasis on the structure of hypothalamus and anterior pituitary. The associated hormones and the related disorders will be explained.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Understand neurohormones and neurosecretions.
CO2	Learn about hypothalamo and hypapophysial axis.
CO3	Understand about different endocrine glands and their disorders.
CO4	Understand the mechanism of hormone action.

Unit-I: The chemical messengers

Definition and classification of hormores. Endocrine, paracrine and autocrine modes of hormone delivery, Feedback mechanism.

Unit II: Hypothalamo-hypophysial Axis

Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction; Structure of hypothalamus, Hypothalamic nuclei and their functions; Regulation of neuroendocrine glands, Feedback mechanisms; Structure of pituitary gland, Its hormones and their functions; Hypothalamo-hypophysial portal system; Disorders of pituitary gland.

Unit-III: Peripheral Endocrine Glands

Structure, Hormones, Functions and Regulation of Thyroid gland; Parathyroid & Adrenal glands; Pancreas; Ovary and Testis; Hormones in homeostasis; Disorders of endocrine glands.

Unit-IV: Regulation of Hormone Action

Hormone action at Cellular level: Hormone receptors; Transduction and regulation of Hormone action at Molecular level; Molecular mediators; Genetic control of hormone action.

Unit V: Hormonal Imbalances

Human diseases in connection with hormonal imbalances

Recommended readings

1. Turner, C. D. (1971) General Endocrinology, Pub- Saunders Toppan.

2. Nussey, S.S.; and Whitehead, S.A. (2001) Endocrinology: An Integrated Approach, Oxford: BIOS Scientific Publishers.

3. Hadley, M.E. and Levine J.E. (2007) Endocrinology (6th edition) Pearson Prentice-Hall, New Jersey.

4. David, O.N. (2013) Vertebrate Endocrinology.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all III B.Sc., Zoology effective from the year 2018-2019

Year: III Year Subject Code : U18EZL503 Semester : V

Elective-1 Title: **REPRODUCTIVE BIOLOGY (Elective-I)**

Credits: 3 Max. Marks. 75

OBJECTIVES	The major objective of this course is to provide students with a sound coverage of human reproductive biology within the framework of Human Biology. It also envisages the detailed structure and function of the male and female reproductive tracts, gametogenesis, fertilization, early embryogenesis, foetal development and preparation for birth, and maternal adaptations to pregnancy.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Explain and contrast the processes of spermatogenesis, oogenesis.
CO2	Demonstrate an understanding of the hormonal control of reproduction in males and how this is regulated;
CO3	Distinguish between the main stages of embryonic, foetal and neonatal development and causes of foetal disorders.
CO4	Understand the origin and characteristics of common congenital malformations;

Unit-I:

Structure and function of male reproduction; Formation of sperm and fertility of individual; Steroids in sports, exogenous and endogenous**.** Structure and function of female reproduction

Unit-II:

Sexual differentiation, Puberty; Formation of the gametes; Formation of ova. Physiology of ovulation, menstrual cycle; Nutrition and stress influences on the ovulatory cycle.

Unit-III:

Process of fertilization; Implantation and formation of the foetus and placenta; Pregnancy, foetal development; Labour and birth, lactation and neonatal life; Reproductive Ageing; Menopause.

Unit-IV:

Evolution of human reproductive strategy; Evolutionary impact on behaviour; Sexuality hormonal effects on maternal-infant bonding; Parturition; Society's effects on reproduction; Stress, anorexia, steroids in the environment; Endocrine disrupting chemicals.

Unit-V

Sexual dysfunctions, sexually transmitted diseases; Cancers of the reproductive system; Adenomyosis: gland-like growth into myometrium; Birth Control; Assisted Reproduction Technologies; Intrauterine devices (IUD), endometriosis, fibroids, Endometritis: chronic infection of uterus, congenital uterine anomalies; Ovarian cysts, pelvic varicosities.

Recommended readings

1. Thomas W.S. (2014) Langman's Medical Embryology (13th edition) Lippincott, Williams & Wilkins, Baltimore.

2. Gary C.S.; Steven B.B.; Philip R.B. and Philippa H.F. (2014) Larsen's Human Embryology (5th edition) Elsevier.

3. Gilbert, S.F. (2016) Developmental Biology (11th edition) Sinauer.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for all III Year UG Course effective from the year 2018-2019

Year: III Year Subject Code : U18EINP51 Semester : V

Internship Title: **INTERNSHIP TRAINING/PROJECT**

Credits: 2 Max. Marks. 100

OBJECTIVES	Internships are educational and career development opportunities, providing practical experience in a field or discipline.
COURSE OUTCOME(S): At the end of the course students can be able to	
CO1	Apply knowledge of theoretical concepts, tools and resources.
CO2	Analyze and solve complex problems in order to reach substantiated conclusions.

Instructions for Internships

1. **Internship –**
   - **a.** Internship with Industry/ Govt. / NGO/ PSU/Any Micro/Small/Medium enterprise/ Online Internship
   - **b.** Inter/Intra Institutional Activities – Inter/ Intra Institutional Workshop/ Training/ Working for consultancy/ research project
2. **Suggested Periods –** During summer vacation after 4th semester.
3. **Duration –** 2 Weeks
4. **Proposed document to be submitted as evidence –** Internship Report and Certificate

Internship Report:

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period. The student may contact Industrial Supervisor/ Faculty Mentor for assigning special topics and problems and should prepare the final report on the assigned topics. Daily diary will also help to a great extent in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The training report should be signed by the Internship Supervisor and Faculty Mentor.

5. **Evaluation Method –** Viva-voce Examination by the Faculty mentor and Faculty from other department.

Internal: 25 marks (For attendance)
External: 75 Marks (Internship report)

The Internship report will be evaluated on the basis of following criteria:

i. Originality **(15)**.
ii. Adequacy and purposeful write-up **(15)**.
iii. Organization, format, drawings, sketches, style, language etc **(15)**.
iv. Variety and relevance of learning experience **(15)**.
v. Practical applications, relationships with basic theory and concepts taught in the course **(15)**.

Note: Internships may be full-time or part-time; they are full-time in the summer vacation and part-time during the academic session.

Project/Internship Programme

There will be a project work/internship programme at the end of Semester IV as prescribed by the respective boards of studies, if applicable. The following guidelines / clarifications are offered for the Project with Viva-voce:

1. The project work/internship should be valued for 100 marks by the faculty mentor and one internal expert appointed by the COE.
2. The internship has to be done with the institution laboratory / micro / small / medium enterprise / Institutional workshop / training / consultancy research project etc. It should be a maximum of two weeks.
3. The students should prepare and submit a report about what he has observed and learnt in the training period. The topic of interest will be assigned by the faculty mentor along with the industrial supervisor.
4. The Project Report may consist a minimum of 20 and to a maximum of 50 pages.
5. The candidate has to submit the Project Report 30 days before the commencement of the V Semester Examinations.

Guidelines for Individual/ Team Projects and Field Reports

The aim of the individual/ team project/s is to develop an aptitude for research in Zoology and to inculcate proficiency to identify appropriate research topic and presentation.
The topics of biological interest and significance can be selected for the project. Project or Internship is to be done by a group not exceeding 5 students or individually. The project report should be submitted on typed A4 paper, 12 Font, 1.5 Space in spirally bound form and duly attested by the supervising teacher and the Head of the Department on the day of practical examination before a board of two Examiners for End Semester. The viva-voce based on the project is conducted individually. Project topic once chosen shall not be repeated by any later batches of students.
The project report may have the following sections:
1. Preliminary (Title page, declaration, certificate of the supervising teacher, content etc.)
2. Introduction with relevant literature review and objective
3. Materials and Methods
4. Result
5. Discussion
6. Conclusion / Summary
7. References.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Year: III Year Subject Code : U18EZL503 Semester : V

Skill Based-3 Title: **FISHERIES AND AQUACULTURE (SBS-III)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To enumerate the fishery and aquaculture potential and practices in India and augment food production from aquatic resources. The syllabus will be helpful for an UG student is attending ICAR and other competitive examinations.
COURSE OUTCOME(S): After successful completion of the course, students shall be able to	
CO1	Recall the commercially important inland and marine fishery resources of India
CO2	Describe various culture practices adopted for aquatic organisms
CO3	Write procedures for development of various feed formulation
CO4	Analyse the status of fishing sector in the country
CO5	Construct an aquaculture farm of his own to become an entrepreneur

UNIT – I

Capture fisheries - present status and scope – Inland and marine fisheries – Outlook of marine fisheries of India – Indian EEZ and its yield – pelagic fish resources – demersal fish resources – Exploitation of Oil sardine – seer fishes – mackerel – prawn (*F. indicus*).

UNIT – II

Biology of Indian major carps. Carp culture: collection of seeds – natural breeding, induced breeding, transportation of seeds. Shrimp culture: collection of seeds – induced breeding, culture practices. Edible oyster culture: collection of seeds – induced breeding, culture practices

UNIT – III

Types of Aquaculture: extensive - semi-intensive and intensive culture – monoculture - monosex culture – polyculture - cage culture - pen culture – seaweed culture - integrated fish farming – paddy cum fish culture - pig cum fish culture - sewage fed fish culture.

UNIT- IV

Fish feed: artificial feed – feed formulation – need - ingredients ratio - pellets. Live feeds and their culture: *Artemia* – rotifers - microalgae. Diseases of aquaculture organisms: bacterial, viral and fungal diseases – nutritional deficiency diseases.

UNIT – V

Methods of fish harvesting – craft and gears used for inland and marine fisheries - Fish preservation – fishery products – High value products from processing waste – socioeconomic status of fishery folk – fishing holidays – fishery education and research – role of government organizations - CMFRI – CIFT – MPEDA – CIBA-CIFE etc.

Student Activity: A one/two days visit to Fisheries research Institutes/Fisheries University/Fishing Harbour/Fish landing centre.

TEXT BOOK

1. Jhingran, V.G. 1991. Fish and fisheries of India. Hindustan Publishing Corporation (India), Delhi
2. Mohan Joseph Modayil and Pillai, N.G.K. 2007. Status and perspectives of Marine fishery research in India. CMFRI Publications, Kochi.

Suggested Readings:

1. Pillai, T.V.R., Aquaculture and the environment. 1st edition, Fishing news Books, England, 1992.
2. Pandian, T.J., Sustainable indian fisheries, 2001
3. S. Paulraj., Shrimp farming techniques, problems and solutions-1995
4. Kurian, C.V and V.O. Sebastian. Prawns and prawn fisheries of India IV edition 1993
5. Vijayan, K.K. et al., 2007. Indian Fisheries: A progressive outlook. CMFRI Publications, Kochi.
6. Mohan Joseph Modayil and Jayaprakash, A.A. 2003. Status of exploitory marine fisheries research of India. CMFRI Publications, Kochi.
7. Sandhu, G.S. 2010. A text book of fish and Fisheries of India. Wisdom Press, New Delhi.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Major-8 Title: **ENVIRONMENTAL BIOLOGY**

Credits: 5 Max. Marks. 75

OBJECTIVES	To realize the importance of interrelationship between every organism and environment.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Express the concept of animal and their living habitat
CO2	Explain the principle of Environmental Laws in the Biosphere
CO3	Discuss the interrelationship between Organisms
CO4	Write the environmental issues for sustainability

Unit I:

Parts of environments: Atmosphere, Hydrosphere, Lithosphere and Biosphere.

Types of media and substratum, and their interaction with organisms: Air, Water and Soil.

Environmental limiting factors and their influence on organisms: Temperature, Light.

Unit II:

Scope, divisions and branches of Ecology: Autecology and synecology

Concept, Structure, Boundary and functions of Ecosystem.

Biogeochemical cycles – Gaseous cycle Nitrogen and Sedimentary cycle Phosphate.

Unit III:

Characteristics of Population: Density, Dispersion, Natality, Mortality, Age distribution and Growth forms.

Characteristics of Community: Species diversity, Community dominance, Stratification, Ecotone and Edge effect, Ecological Niche and Ecological Succession.

Species interactions: Inter and Intra-specific interaction, Colony formation, Predation, Parasitism, Commensalism, Mutualism.

Unit IV:

Types of Ecosystems: Natural and artificial ecosystems - Varities of Ecosystems: Pond, Estuarine, Marine, Forest and Grassland.

Energy transfer: Production, Food chain, Food web, Trophic levels, Energy pyramids, Energy flow from comparative ecosystems.

Unit V:

Biodiversity and Conservation: Hot spots of Biodiversity, Threats to biodiversity, Biodiversity status of Globe and India; Invasive, Endangered and Endemic species of India. In-situ and Ex-situ conservation

Environmental Impact Assessment (EIA): Purpose and aim of EIA, Process of EIA, Participants of EIA, Impact Identification Methods, Diversification of EIA.

TEXT BOOK

1. Chapman J.L. and M.J. Reiss, 1999. Ecology Principles and Applications (2nd Edition), Cambridge University Press, Cambridge

Suggested Readings:

1. Odum, E.P.,1971. Fundamentals of Ecology (3rd Edition), Saunders College Publications, Philadelphia London, Toronto.
2. Odum, E.P., 1983. Basic Ecology (3rd Edition), Sanders College Publications, Philadelphia London, Toronto.
3. Singh, J.S., S.P. Singh and S.R. Gupta, 2015. Ecology, Environmental Science and Conservation (1st Edition), S. Chand Publications, New Delhi.
4. Kotal, R.L. and N.P. Bali. Concept of Ecology, Vishal Publications, New Delhi.
5. Arumugam, 2004. Concept of Ecology, Saras Publication, Nagarcoil.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Major-9 Title: **ECONOMIC ZOOLOGY**

Credits: 4 Max. Marks. 75

OBJECTIVES	To encourage young learners to take up the small scale industries and provide opportunity for self-employment.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Summarize the techniques of Vermiculture, Apiculture and Sericulture
CO2	Design an aquaculture practice of his own
CO3	Plan a dairy farm of his own
CO4	Formulate a new feed for livestock

UNIT – I

Vermiculture and vermi composting – difference between vermiculture and vermi composting-Earthworm diversity – biology of composting earthworms – *Eoisena foeitida*, *Eudrilus lugeniae*. Verimiculture technique-Applications of vermi composting in agricultural and horticultural practices. Economics of vermi culture, nationalized bank NABARD support for vermi culture.

UNIT –II

Apiculture: Classification and Biology of Honey Bees, Rearing-Newton's Hive- Products of Apiculture Industry and its Uses (Honey, Bees Wax, Propolis), Pollen etc. Apiculture as a self-employment.

Sericulture: Types of silkworms, Distribution and Races- Selection of mulberry variety and establishment of mulberry garden. Rearing of larva - rearing house and rearing appliances. Sericulture industry in different states, employment potential in mulberry and non-mulberry sericulture.

Lac Culture

UNIT – III

Ornamental Fish culture: Exotic and Endemic species of Aquarium Fishes- Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish- General Aquarium maintenance - budget for setting up an Aquarium Fish Farm as a Cottage Industry.

UNIT – IV

Dairy farm management, Milch breeds. Draft Breeds, Dual Purpose Breeds and New cross Breeds of Cows and Buffaloes in India.

Sheep farming: Indigenous and Exotic breeds of sheep

UNIT – V

Future strategies for Livestock Development – Genetic Improvement for best Breeds.

Economic importance of Leather, Wool and fur. Medicinal products from animals.

TEXT BOOK

1. Sukla, G.S. and Upadhyay, V.B., 2000, Economic Zoology – ISBN – 81- 7133 -137 -8 Rastogi Publication, Meerut, India.

Suggested Readings:

1. Jawaid Ahsan and Subhas Prasad sinha – 2000, A Handbook on Economic Zoolgy - ISBN – 81 – 219- 0876 – 0, S. Chand & co., Ltd., New Delhi.

2. Ashok Kumar and Prem Mohan Nigam, 1991, Economic and Applied Entomology, Emkay Publication, New Delhi.
3. Shammi,Q.J. and Bhatnagar, S., 2002, Applied Fisheries: ISBN – 81 – 7754 – 114 – 5, Agrobios [India], jodhpur – India.
4. Kaushish, S.K., 2001, Trends in livestock Research – ISBN – 81 – 7754 – 112 – 9, Agrobios [India], Jodhpur– India.
5. Ismail, S.A1997. Vermicology the Biology of Earthworm. Orient Longman, India.
6. Mary Violet chrishty 2008 Vermitechonology MJP Publ. Chennai.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Major-10 Title: **EVOLUTION**

Credits: 4 Max. Marks. 75

OBJECTIVES	To comprehend the scientific concepts of animal evolution through theories and evidences.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Describe the Origin of life and their evidences
CO2	Write the various theories of Evolution
CO3	Explain the principles behind Mimicry and Isolating mechanisms
CO4	Appraise the evolution of man

UNIT – I

Origin of Life-Theories-Evidences: The need of evidences for the fact of evolution – Morphological, Anatomical, Embryological, Physiological, Biochemical and Paleontological evidences.

UNIT – II

Theories: Lamarckism, Neo-Lamarckism, Darwinism, Neo-Darwinism, De-Vries concept of Mutation, Modern concept of Mutation theory.

UNIT – III

Natural selection: Types, stabilizing and diversifying directional selection, Variation: Types of variation.

UNIT-IV

Isolation mechanism - Premating and post mating.

Speciation - concept and types.

Evolution of man – Biological and cultural.

UNIT – V

Mimicry and colouration – Batesian and Mullerian mimicry and evolution, living fossils.Geographical distribution of animals.

TEXT BOOK

1. Veer Bala Rastogi. 2013. Organic Evolution, Meerut Publications.

Suggested Readings:

2. Agarwal, V.K and Usha Gupta – Evolution and Animal distribution, Chand and Co.
3. Dodson,E.O. 1990. Evolution, Reinhold, Newyork.Francisco, J.Ayla – Evolution, Surject publication.
4. Gopalakrishnan,T.S. IttaSambasivaiah and A.P.KamalakaraRao. Principles of organic Evolution,Himalaya publishing house.
5. T.K.Ranganathan, Evolution.1994 Rainbow Printers, Palayankottai.
6. Arumugam, N. Organic Evolution, 2009. Saras Publishers,.Nagarcoil, Kanyakumari Dt.

Syllabus for all III B.Sc., Zoology effective from the year 2018-2019

Year: III Year Subject Code : U18EZL601 Semester : VI

Elective-2 Title: **BIOCHEMISTRY (Elective-II)**

C. Abdul Hakeem College (Autonomous), Melvisharam.

Credits: 3 Max. Marks. 75

OBJECTIVES	To define and explain the basic principles of biochemistry.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Define the basic structure of atoms and their interactions
CO2	Explain the functions of various enzymes in man
CO3	Classify the carbohydrates, proteins and Lipids
CO4	Elaborate the various metabolic process

UNIT – I

Introduction – structure of an atom, molecule – chemical bonds — pH and buffers– Structure and properties of water - hydrogen ion concentration, acids and bases and their concept.

UNIT – II

Enzymes and co-enzymes – classification and nomenclature - functions, substrate specificity, factors influencing the enzyme action. Chemistry of DNA and RNA. Nitrogenous bases - Structure and functions of purines and pyrimidines.

UNIT – III

Carbohydrates – classification, structure, properties and functions-metabolic pathways - glycolysis, Kreb's cycle and electron transport chain.

UNIT – IV

Protein – classification, structure, properties and functions – amino acids – classification, structure, properties and functions– metabolism of protein – deamination, transamination – trans deamination - Inborn errors in amino acids metabolism. Brief account on heterocyclic compounds - antibiotics - bacterial cell wall inhibitors - structure and functions of Penicillin, Tetracycline and Streptomycin.

UNIT – V

Lipids – classification, structure, properties and functions - fatty acids, triglycerides, wax and their properties.Lipid metabolism – ß-oxidation-role of liver in fat metabolism – metabolism of cholesterol.

TEXT BOOK

1. Nelson, D. L., Cox, M, 2018. Lehninger Principles of biochemistry (6th edition). Macmillan Publishers and Distributors, New Delhi-32.

Suggested Readings:

1. Shanumugam, A., 1977. Fundamentals of biochemistry for medical students. Nava Baharat Printers and Traders, Madras-6.
2. Stryer, L., W. H., 1995. Biochemistry. Freeman and Company, San Francisco.
3. Murray, R. K., Granner, D. K., Mayes, P. A. and Rodwell, V. W., 1996. Harper's biochemistry (24th edition). Prentice Hall of Japan, Inc., Tokyo.
4. West E. S., Todd, W. R., Mason, S. H. and Van Bruggen, J. T., 1974.Textbook of biochemistry (4th edition). Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi-2.

5. Kuchel P.W & G. B. Ralston, 2003. Schaum's outlines of biochemistry (2nd edition). Tata McGraw-Hill Edition.
6. S. C. Rastogi. 2003. Biochemistry (2nd edition). Tata McGraw-Hill Publishing Company Ltd.

Credits: 3 Max. Marks. 75

OBJECTIVES	To infuse sound knowledge about the silkworm, their economic importance and diseases and to disseminate Sericulture as a need - based curriculum.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Describe the economic importance of Sericulture
CO2	Construct an small scale mulberry farm.
CO3	Evaluate the diseases and pests of Silkworm.
CO4	Develop a silkworm rearing unit

UNIT -I: ECONOMIC IMPORTANCE AND SILKWORM BIOLOGY

Prospects and status - Trends of production and its economic importance - demand and utilization. Silk producing species - their distribution - Bombyx mori - life cycle - organization of larvae, pupae and moth - structure of the silk gland.

UNIT-II: MORICULTURE

Mulberry - varieties - distribution - methods of cultivation and preparation - Harvest - Transport and preservation of leaves. Feeding and nutrition - specificity of diet - Factors of nutrition - Diet and growth. Pest and diseases.

UNIT-III: SILKWORM REPRODUCTION AND GENETICS

Reproduction - Growth and Development of silkworms - Physiology of molting in different varieties (Uni, bi and multivoltine) - Endocrinology of reproduction and development. Genetics - mutation breeding and development of new strains.

UNIT-IV: PATHOGENIC DISEASES AND PEST

Pathology - Viral, bacterial, fungi and protozoan diseases - control mechanisms. Uzifly menace.

UNIT-V: SILKWORM REARING AND SILK REELING

Rearing operations - Selection and construction of rearing house - Incubation - Hatching - brooding, Harvesting etc. Reeling techniques - lacing - skinning. Re-reeling etc,

REFERENCE BOOKS:

1. Ganga, G. and Sulochana Chetty, J. 1997.An Introduction to Sericulture. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

2. Ganga, G. 2003. Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

3. Hisao Aruga. 1994. Principles of Sericulture (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

4. Veda, K., Nagai, I. and Horikomi, M. 1997. Silkworm Rearing (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

5. Lu Yup-Lian and Liu-Fu-an. 1991. Silkworm Diseases – Published by by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Year: III Year Subject Code : U18MZL604 Semester : VI

Elective-2 Title: **FOOD,NUTRITION AND HEALTH (Elective-II)**

C. Abdul Hakeem College (Autonomous), Melvisharam.

Credits: 3 Max. Marks. 75

OBJECTIVES	The course covers the basic concepts of balanced diet for people of different ages besides focusing on the consequences of malnutrition and the deficiency diseases and the diseases caused due to poor hygiene.
COURSE OUTCOME(S): After successfully completing this course, the students will be able to:	
CO1	Describe the role of food and nutrients in health and disease.
CO2	Elaborate culturally competent nutrition services for diverse individuals.
CO3	Implement strategies for food access, procurement, preparation, and safety that are relevant for the culture, age, literacy level, and socio-economic status of clients and groups.
CO4	Analyse food system management and leadership functions that consider sustainability in business, healthcare, community, and institutional arenas.

Unit - I

Basic concept of Food: Components and nutrients. Concept of balanced diet, nutrient requirements and dietary pattern for different groups viz., adults, pregnant and nursing mothers, infants, school children, adolescents and elderly people.

Unit - II

Nutritional Biochemistry: Macronutrients. Carbohydrates, Lipids, Proteins- Definition, Classification, their dietary source and role. Micronutrients. Vitamins- Water-soluble and Fat-soluble vitamins- their sources and importance. Important minerals *viz*., Iron, Calcium, Phosphorus, Iodine, Selenium and Zinc: their biological functions.

Unit - III

Definition and concept of health: Common nutritional deficiency diseases- Protein Malnutrition (e.g., Kwashiorkor and Marasmus), Vitamin deficiencies, Iron deficiency and Iodine deficiency disorders- their symptoms, treatment, prevention and government initiatives.

Unit - IV

Life style dependent diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention. Social health problems- smoking, alcoholism, narcotics. Acquired Immuno Deficiency Syndrome (AIDS): causes, treatment and prevention. Other ailments *viz*., cold, cough, and fever, their causes and treatment.

Unit - V

Food hygiene: Potable water- sources and methods of purification at domestic level. Food and Water-borne infections: Bacterial diseases: cholera, dysentery; typhoid fever, viral diseases: Hepatitis, Poliomyelitis etc., Protozoan diseases: amoebiasis, giardiasis; Parasitic diseases: taeniasis and ascariasis their transmission, causative agent, sources of infection, symptoms and prevention. Causes of food spoilage and its prevention.

Suggested reading

1. Mudambi, S.R. and Rajagopal, M.V. (2007). Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed;; New Age International Publishers

2. Srilakshmi, B. (2002). Nutrition Science; New Age International (P) Ltd.

3. Srilakshmi, B. (2007). Food Science; Fourth Ed; New Age International (P) Ltd.

4. Swaminathan, M. (1986). Handbook of Foods and Nutrition; Fifth Ed; BAPPCO.
5. Bamji, M.S.; Rao, N.P. and Reddy, V. (2009). Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd.
6. Wardlaw, G.M. and Hampl, J.S. (2007). Perspectives in Nutrition; Seventh Ed; McGraw Hill.
7. Lakra, P. and Singh M.D. (2008). Textbook of Nutrition and Health; First Ed; Academic Excellence.
8. Manay, M.S. and Shadaksharaswamy, M. (1998). Food-Facts and Principles; New Age International (P) Ltd.
9. Gibney, M.J. et al. (2004). Public Health Nutrition; Blackwell Publishing.

Year: III Year Subject Code : U18EZL602 Semester : VI

Elective-3 Title: **WILDLIFE CONSERVATION (Elective III)**

C. Abdul Hakeem College (Autonomous), Melvisharam.

Credits: 3 Max. Marks. 75

OBJECTIVES	To make the students equipped with principles and applications of various wildlife management techniques
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Explain the basic ideas and laws behind Animal Conservation
CO2	Outline the various survey techniques and population estimation methods
CO3	Point out the laws in Human-Animal conflicts and experiment with case studies
CO4	Survey and Take part in Animal Conservation Campaign

Unit I:

Wildlife Management: Basic concepts and principles - Wildlife management before and after implementation of Wild Life (Protection) Act, 1972 – IUCN – WWF - CITES – NBA – IBA – Project Tiger – Project Elephant – Project Crocodile. List of endangered species.

Unit II:

Evaluation of Wildlife habitat: Define habitat – Forest habitat types - basic survey techniques of habitats – Vegetative analyses – Point centered quadrat, Quadrat, strip transect – Habitat manipulation: Food, Water, shade, impact and removal of invasive alien species

Unit III:

Population Estimation: Basic concepts and applications - Direct count (block count; transect methods, Point counts, visual encounter survey, camera trap, aerial photography and waterhole survey,). Indirect count (Call count, track and signs, pellet count, pugmark, DNA finger printing).

Unit IV:

Human-animal Conflicts: Basic concepts, reason for conflicts, Identification of damages caused by wild animals and control measures. Case studies – Elephant, gaur, wild boar, monkey, tiger and leopard, Translocation of Wild animals – Principles, Methods and application.

Unit V:

Zoos, Zoological Parks, Wildlife Sanctuaries, National Parks & Tiger Reserves

In-situ and ex-situ conservation techniques

Case studies (Arignar Anna Zoological Park, Mudumalai and Periyar Tiger Reserves - Nilgiri Biosphere Reserve).

(Student activity: One day visit to Zoo/Zoological Park or 2-3 days Forest visit)

TEXT BOOK

1. Ranga, M.M., (2012) Wildlife Management and Conservation (2nd Ed.) Agrobios Publications.

Suggested Readings:

1. Saharia, V.B. 1982 Wildlife in India, Nataraj Publishers, Dehra Dun
2. Seshadri, B.1986 India's Wildlife reserves , Sterling Pub'rs Pvt. Ltd., New Delhi
3. Giles, R.H. Jr. (Ed) 1984. Wildlife Management Techniques 3rd edition.The wildlife Society, Washington. D.C. Nataraj Publishers,Dehradun. India
4. Dasmann, R.F. 1964, Wildlife Biology. John and Wiley and sons Newyork. Pp231.
5. Robinson, Wl. and Eric, G. Bolen, 1984. Wildlife Ecology and Management Mac Millan

Publishing Co, Ny. Pp 478.

C. Abdul Hakeem College (Autonomous), Melvisharam.

Credits: 3 Max. Marks. 75

OBJECTIVES	This course is designed to provide students with an understanding of the management and planning of ecotourism opportunities. The course will give students to the concept of ecotourism and its economic, cultural and environmental impacts at different scales. Students will learn the methods through which ecotourism can be marketed and managed, together with its potential adverse impacts.
COURSE OUTCOME(S): Upon successful completion of the course students shall be able to	
CO1	Identify and manage for ecological impacts to soil, water, vegetation, and wildlife resulting from recreation and tourism development;
CO2	Describe ecological impacts and ecotourism management approaches in a variety of ecosystems under diverse landowners;
CO3	Analyze the environmental and social consequences of ecotourism management strategies and decisions;
CO4	Describe management tools to reduce visitor related impacts that occur in ecotourism areas (impacts of outdoor recreation include impacts to soil, vegetation, water, wildlife, air, soundscape, night sky, historical/cultural resources, visitor experiences, and facilities/services).

Unit - I

History of ecotourism and its definitions. Types of Tourism: Extreme tourism Mass tourism. Why is mass tourism NOT eco-friendly? Evolution and characteristics of ecotourism, relevance of responsible tourism.

Unit – II

World Ecotourism Summit- policies and formulations How an ecotourism development can benefit future generations. Ecotourism as a tool of capacity building and conservation.

Unit - III

Ecotourism as a growth sector within the tourism industry. Tourist resorts. Environmental, socio-cultural and economic impacts of ecotourism. Viewpoints on tourism industry and major constituents, Tourism organizations – international, national, state level and private sector, Importance of tourism statistics. Tourism industry in India, Ecotourism in Kerala- possibilities and problems.

Unit - IV

Tourism policies and planning, Involvement of local bodies and officials in tourism, Coordination between tourists and hosts, Tourism products and operation, Tourist sites and attractions. Managing personnel in tourism, Managerial practices in tourism, Tourism services and management, Seasonality and destination in tourism, Preparation of maps and charts.

Unit - V

Tourism marketing- definition, concepts and features Advertising and publicity in tourism Role of media in tourism, Tourism writing. Communication skills and tourism Ecotourism and competing resource users. International and domestic tourism markets, Marketing research and analysis, Tourism forecasting and use of technology in tourism marketing, Airlines, Travel Agency, hotel accommodation, tour packages marketing etc.

Recommended readings

1. Mowforth, M., & Munt, I. (2009). Tourism and sustainability (3rd Edition). London, UK: Routledge.

2. Newsome, D., Moore, S.A., & Dowling, R.K (2002). Natural area tourism. Bristol, UK: Channel View. (Publications.

3. Weaver, D. (2008). Ecotourism (2nd Edition). Hoboken, NJ: JS Wiley. Staff : Dr Julian Clifton

C. Abdul Hakeem College (Autonomous), Melvisharam.

Credits: 3 Max. Marks. 75

OBJECTIVES	The course will provides a comprehensive survey of the theory and methodology of systematics as they are applied today to all groups of organisms. The course is directed at those students interested in studies of evolutionary biology, biodiversity, conservation biology, and/or systematics.
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Comprehend the basic concepts of animal taxonomy and zoological nomenclature
CO2	Evaluate the significance of museum specimens
CO3	Analyze the implications of biometrics, numerical taxonomy and cladistics.
CO4	Understand the historical development of systematic biology from the 18th century to the present.

Unit - I

Kinds and diversity of living forms. Biogeographical zones; Endemism. Importance of collections/ museum specimens of the world and India; Documentation of biodiversity. Systematics and taxonomy. Importance and basis of classification. Heirarchy of classification and classification systems. Types of classification-artificial, natural and phylogenetic.

Unit - II

Systematic data: kinds of data. Taxonomic treatment of allopatric variation, homology; Reproductive isolating mechanisms; Hybridization and introgression; Polyploidy; Modes of speciation. Principles and criteria of taxonomic treatment:

Unit – III

Taxonomic evidence: Characters and character states. Taxonomic characters; OTUs, character weighting, cluster analysis; Phenetics, Evolutionary taxonomy, Cladistics. Constructing trees/ dendrograms: Phenogram, phylogram and cladogram and turning them into classifications.

Unit IV

Molecular phylogenetics: Gene structure, mutation and rates and patterns of nucleotide substitutions. Mitochondrial genome. Molecular "clock" hypothesis. Phylogeny estimation methods: Distance data, Maximum-parsimony, Maximum-likelihood etc. Cladogram reliabilities, Molecular characterization versus morphological characterization: Conflict or compromise?

Unit - V

Identification, Description, Naming of taxa. Keys: indented and racketed keys. Principles and rules of International Code of Nomenclature (ICN), binominal system, type material, author citation, criteria for publication, types of names, principle of priority and its limitations. curation of taxonomic collections. Taxonomic revision. Taxonomic literature. The relevance of systematics in conservation programmes

Recommended readings

1. Mayr, E. and Ashlock, P.D. (1991). Principles of Systematic Zoology. (2nd edition) New York: McGraw Hill, Inc.

2. Quicke, D. L. J. (1993). Principles and Techniques of Contemporary Taxonomy. New York: Chapman and Hall

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Year: III Year Subject Code : U18SZL601 Semester : VI

Skill Based-4 Title: **MEDICAL LABORATORY TECHNIQUES (SBS-IV)**

Credits: 2 Max. Marks. 75

OBJECTIVES	To impart awareness on Clinical Lab Technology and creating Self-Employment Opportunity.
COURSE OUTCOME(S): After completion of the course students will be able to	
CO1	Describe the basic rules of Medial lab Technician
CO2	Write the various disease detection techniques
CO3	Apply the learned technique and examine human pathogens
CO4	Plan a proper code of ethics

UNIT – I:

Scope of Medical Lab Technology, Medical laboratory personnel – code of conduct - laboratory management and maintenance - safe disposal of hospital waste - laboratory requirements. Sterilization methods: physical agents-dry heat - hot air oven, moist heat - autoclave, pressure cooker; chemical agents; ultraviolet radiation. Haemocytometry, Red cell indices (MCV, MCH, MCHC).

UNIT – II:

Haematopoietic system - Erythropoiesis, Lecopoiesis, Thrombopoiesis. Collection of blood samples, composition of blood, plasma, serum, Total RBC andWBC count, Estimation of Heamoglobin Erythrocyte Sedimentation Rate (ESR). Packed Cell Volume (PCV), Reticulocyte count, Differential count, Basic principle of blood transfusions.

UNIT – III:

Semen analysis: Sperm count, abnormal sperms, common pathological conditions detected in semen – their causes.

Pregnancy test (detection of hCG), Amniotic fluid: sex determination, amniocentesis.

Anaemia- classification, Blood clotting factor, Mechanism of coagulation, anticoagulants.

UNIT – IV:

Urine: Physical examination, blood cells, urine glucose, urinary albumin, bile salts, ketone bodies, Urine culture – Antibiotic susceptibility test.

Faeces (stool): Components of faeces and their characteristics, factors affecting faecal composition, Occult blood in stool.

Sputum: Analysis of sputum – Pathological conditions that can be detected in sputum – their causes.

UNIT – V:

Clinical diagnosis of diseases and detection techniques: Typhoid, Cholera, Tuberculosis, Polio, Measles, Amoebiasis and Filariasis.

Detailed account and life cycle- *Plasmodium sp, Entamoeba histolytica, Trypanosoma gambiens, Ascaris lumbricoides* and *Taenia solium.*

TEXT BOOK

1. Mukherjee, 2006: Medical Laboratory Technology Vol. I, II & III – Tata McGraw Hill Publ.Co., Noida– India.

Suggested Readings:

1. Samuel, K.M. 1992: Notes on Clinical Lab Techniques. M.K.G. Iyyer& Sons Publ. Co., Chennai –India.
2. Dubey, R.C., and Maheswari, D.K.2007; A text book of Microbiology, S. Chand and Co. Publ. NewDelhi – India.
3. Purohit, S.S. 2005: Microbiology – Fundamentals and Applications [6th Edition], Student Edition –Jodhpur – India.
4. Ochei, 2000: Medical Laboratory Science – Theory and Practice – Tata McGraw Hill Publ, Co., -Noida – India.

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Syllabus for all III B.Sc., Zoology effective from the year 2018-2019

Year: III Year Subject Code : U18MZLP61 Semester : VI

Practical-3 Title: **ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY**

Credits: 3 Max. Marks. 75

OBJECTIVES	To learn the various animal experiments in relation to Physiology, Developr Biology and Immunology
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Demonstrate the various animal physiology experiments
CO2	Identify different developmental stages of Animals and
CO3	Relate the immunological techniques

ANIMAL PHYSIOLOGY:

Study of human salivary amylase in relation to temperature.

Estimation of Oxygen consumption in a fish with reference to body weight.

Detection of nitrogenous waste products in fish tank water (ammonia), bird excreta (Uric acid) and mammalian urine (urea).

Use of Kymograph Unit, B.P. apparatus, Stethoscope.

DEVELOPMENTAL BIOLOGY:

Study of the following prepared slides / museum specimens:

Section of testis and Ovary [Mammalian]

Slides of Mammalian sperm and ovum.

Study of Egg types – Frog's Egg, Hen's Egg.

Study of cleavage stages: 2 Cell, 4 Cell & 8Cell – Blastula and gastrula of Frog.

Slides of different stages of chick embryo – 18 hours [primitive streak stage], 24 hours, 48 hours and 96 hours.

Placenta of Sheep and Man.

IMMUNOLOGY:

Study of Antigen – Antibody reaction – Human Blood grouping [ABO and Rh]

Study of prepared slides of histology:

Thymus

Spleen

Bone marrow

Lymph node.

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Syllabus for all III B.Sc., Zoology effective from the year 2018-2019

Year: III Year Subject Code : U18MZLP62 Semester : VI

Practical-4 Title: **ENVIRONMENTAL BIOLOGY, ECONOMIC ZOOLOGY AND EVOLUTION**

Credits: 3 Max. Marks. 75

OBJECTIVES	To learn the perform environmental analysis methods and to study the various animals of economic importance
COURSE OUTCOME(S): At the end of the course students shall be able to	
CO1	Analyse the various ecological parameters
CO2	Identify various economically important animals.
CO3	Infer from the fossils

ENVIRONMENTAL BIOLOGY:

Estimation of Dissolved oxygen, CO_2, salinity, pH, Free Carbonate and Bicarbonates in water samples and TOC in sediment samples.

Use of Rain gauge, Maximum and Minimum thermometer and Hygrometer.

Plankton study – fresh water and Marine planktons.

Study of natural ecosystem and field report.

ECONOMIC ZOOLOGY:

Study of the following prepared slides / specimens

Vermiculture: Earthworm types [any two] *Megascolex mauritii*; *Drawida modesta*; *Pheretima posthuma*; *Eudrilus eugeniae*.

Apiculture: Honey bee Colony, Bee Hive

Sericulture: Stages of Silkworm, Muscardine and Pebrine disease

Lac culture: Kusumi and Rangeeni – male and female. Lac seal

Ornamental fish culture – Guppy, gold fish.

Dairy farm breeds any two (Cow and Buffalo)

External parasites of farm animals – Ticks and mites.

Dairy Industry products: Fur and wool,

Leather specimen - Goat and sheep

Processing and tanning (Visit to nearby tannery unit and photographs should be pasted in record).

EVOLUTION: Spotters/Charts/Specimens

(Limulus, Nautilus, Ammonite, Stick insect, Peripatus**)**

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Year:	III Year	Subject Code :	U18CEA601	Semester :	VI
Extension Activities		**Title: Extension Activities**			
Credits:	1			Max. Marks. 100	