

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)-POLLACHI

22	B.Sc. CT	Skill Based Major Elective I: Python Programming Lab	18UCT5S1	2018
23	B.Sc. CT	Elective III: Internet of Things	18UCT624	2018
24	B.Sc. CT	Elective I: Artificial Intelligence	18UCT519	2018
25	B.Sc. CT	Programming Lab VI: Software Testing	18UCT416	2018
26	M.Sc. Chemistry	Inorganic Chemistry -I	18PCY101	2018
27	B.A. English	CORE III: Fiction	19UEL101	2019
28	B.A. English	CORE III : Children's Literature	19UEL408	2019
29	B.A. English	CORE III: Translation Studies and World Literature in Translation	19UEL511	2019
30	B.A. English	CORE III: Computing Skills for Research	19UEL513	2019
31	B.A. English	CORE III : Survey of Literature in English (For cracking UGC NTA NET/SET/JRF/TRB/TET)	19UEL619	2019
32	B.A.Economics	Core III : History of Economic Thought	19UEO407	2019
33	B.A.Economics	Skill Based: Network and Information Security	19UEO5S1	2019
34	B.A.Economics	Skill Based: Cyber Security Ethical Hacking	19UEO5S2	2019
35	B.Sc. Mathematics	Allied I: Mathematical Statistics-I	19UMS1A1	2019
36	B.Sc. Mathematics	Core III: Trigonometry, Vector Calculus and Fourier Series	19UMS203	2019
37	B.Sc. Mathematics	Core IV: Analytical Geometry 2D and 3D	19UMS204	2019
38	B.Sc. Mathematics	Elective I: Programming in C	19UMS5E1	2019
39	B.Sc. Mathematics	SBE: Network and Information Security	19UMS5S1	2019
40	B.Sc. Mathematics	SBE: Cyber security-Ethical Hacking	19UMS5S2	2019
41	B.Sc. Botany	Skill based subjects - Network and Information security.	19UBY5S1	2019
42	B.Sc. Botany	Skill based subjects (Major electives) -Cyber Security- Ethical Hacking.	19UBY5S2	2019
43	B. Sc. Zoology	Core Major Paper-VII - Developmental Biology	19UZY507	2019
44	B. Sc. Zoology	Core Major Paper-X Bioinformatics and Biochemistry	19UZY510	2019
45	B. Sc. Zoology	Skill Based elective (SBE)- Online- Network and Information Security	19UZY5S1	2019
46	B. Sc. Zoology	Skill Based elective (SBE)- Online- Cyber security - Ethical Hacking	19UZY5S2	2019



Metric : 1.2.1

New Course Introduced

Dr. R. MUTHUKUMARAN,
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PRINCIPAL
N.G.M. College, Pollachi - 642 001
Coimbatore District

BoS Minutes
Highlighted



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NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)-POLLACHI

47	B. Sc. Zoology	Core Major Paper-XI Animal Physiology and Endocrinology	19UZY611	2019
48	B. Sc. Zoology	Core elective Paper VI- Dairy farming and management	19UZY6E6	2019
49	M.Com	Marketing Research	19PCO102	2019
50	M.Com	Strategic Management	19PCO2E2	2019
51	M.Com	Corporation Finance and Institutions	19PCO310	2019
52	M.Com	Logistics Management	19PCO4E3	2019
53	Tamil Aided	Tamil Paper I	19UTL101	2019
54	Tamil Aided	Tamil Paper II	19UTL202	2019
55	Tamil Aided	Tamil Paper III	19UTL303	2019
56	Tamil Aided	Tamil Paper IV	19UTL404	2019
57	B.A. Tamil	Ikkala Ilakiyam	19UTM101	2019
58	B.A. Tamil	Ara Ilakkiyam	19UTM102	2019
59	B.A. Tamil	Sitru illakiyam	19UTM204	2019
60	B.A. Tamil	Bhakthi illakiyam	19UTM306	2019
61	B.A. Tamil	Kanni Ilakkiyam	19UTM3A3	2019
62	B.A. Tamil	Porulilakkanam	19UTM407	2019
63	B.A. Tamil	Pataipu Ilakkiyam	19UTM408	2019
64	B.A. Tamil	Kappiyangal	19UTM505	2019
65	B.A. Tamil	Tamil mozhi varalaru	19UTM511	2019
66	B.A. Tamil	Sanga illakiyam Ettutogai	19UTM613	2019
67	B.A. Tamil	Sanga illakiyam Pathupattu	19UTM614	2019
68	B.A. Tamil	Aachitamil	19UTM6S3	2019
69	B.Sc.IT	Service Oriented Architecture	19UIT309	2019
70	B.Sc.IT	Lab IV. Web designing (HTML, CSS, JavaScript and Angular)	19UIT311	2019
71	B.Sc.IT	Social Networks	19UIT3N1	2019



BOARD OF STUDIES IN ZOO

held on Saturday (16.02.19)

54

Sl. No.	Name of the Member	Signature
1.	Dr. M. Durairaju (Chairman) Head - Dept. of Zoology	M. D. 16/2/19
2.	Dr. C. Gunasekaran (University Nominee) Asst. Prof. - Dept. of Zoology Bharathiar University Coimbatore - 641 046	C. Gunasekaran 16/2/2019 (Dr. C. Gunasekaran)
3.	Dr. S. Loganarayanan (Subject Expert) Asst. Prof. in Zoology & Controller of Examinations Kongunadu Arts & Science College Coimbatore	S. Loganarayanan 16.02.19 (Dr. S. Loganarayanan)
4.	Mr. R.M. Karthik (Industrialist) Kalpatharu Coir Products 4/100, Thannirai Kanni Thottam Udumalpet.	R.M. Karthik (R.M. KARTHIK) 97907.52220
5.	Mr. N. Eswaran (Alumni) Asst. Prof. in Zoology department APA College of Arts & Culture Palani	N. Eswaran 16/02/19
<u>Members of the Board</u>		
6.	Dr. S. Somasundaram	S. Somasundaram 16/2/19
7.	Ms. S. Mariselvi	S. Mariselvi 16/2/19
8.	Ms. S. Jayalakshmi	S. Jayalakshmi 16/2/19
9.	Dr. S. Christopher	S. Christopher 16/02/19

PRINCIPAL
NGM COLLEGE, POLLACHI

1004
2019

(2019 - 2022)

65

Minutes

⇒ The board includes the University Nominee, Subject Experts, Industrialist, Alumne of the department and all the faculty members are attended the Board of Studies in Zoology held on 16th February 2019.

⇒ The board members were discussed and gave their suggestions. The changes were noted down to be carried out in the curriculum for 2019-22 Batch.

⇒ Environmental studies (EVS) paper for common syllabus has been approved in the board.

Ratification: (2018 - 2021 Batch)

⇒ The board suggested to change the Nomenclature & Syllabi of core Major Paper-VII Developmental Biology & Endocrinology has been changed into Developmental Biology (19 UZY 507) Full length paper.

⇒ The nomenclature of core Major paper-XII Animal Physiology & Biochemistry has been changed into Animal physiology & Endocrinology (19 UZY 614).

⇒ And also core Elective-II Bioinformatics & Information Security has been changed into Bioinformatics & Biochemistry (19 UZY 510).

⇒ Cyber Security - Ethical Hacking (19 UZY 582) & Network and Information Security (19 UZY 581) has been moved to Skill Based Elective (SBE) Common online paper for V Semester in Part-IV.

⇒ The board accepted the changes carried out in the syllabi for 2019-2022 Batch.

⇒ Core Major paper (Sericulture - 19 UZY 615) has been changed to core Elective paper

⇒ Core Elective paper-8 Dairy Farming and Management has been introduced - 19 UZY 626

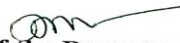
Nallamuthu Gounder Mahalingam College - Curriculum Development Cell
B. Sc. Zoology Scheme of Examination For (2019 – 2022Batch),
Choice Based Credit System & OBES

Part No.	Course Code	Course title	Lecture+ Practical Hours/ week	Duration of Exam Hrs	Max. Marks			Credit Point
					Internal	End-of-Semester	Total	
	Semester I							
I	19UTL101	Tamil/Hindi Paper – I	6	3	25	75	100	3
II	19UEN101	English Paper – I	5	3	25	75	100	3
III	19UZY101	Core Major Paper –I Non-Chordata	7	3	25	75	100	4
		Major Practical – I (Non-Semester Pattern) Non-Chordata & Chordata	2	-	-	-	-	-
	19UBY1A1	Ancillary Zoology Paper–I Non-Chordata & Chordata	6	3	25	75	100	4
		Ancillary Zoology Practical (Paper–I &II)	2	-	-	-	-	-
IV	19UHR101	Human Rights	1	2	-	50	50	2
	19HEC101	HE – (Personal values & SKY Yoga practice -I)	1	2	25	25	50	1
V		Extension activities (See Annexure –I)						
							500	17
	Semester II							
I	19UTL202	Tamil/ Hindi Paper – II	6	3	25	75	100	3
II	19UEN202	English Paper – II	5	3	25	75	100	3
III	19UZY202	Core Major Paper –II Chordata	6	3	25	75	100	4
	19UZY203	Major Practical – I (Non-Semester Pattern) Non-Chordata & Chordata	2	3	40	60	100	4
	19UBY2A2	Ancillary Zoology Paper –II Economic Zoology	6	3	25	75	100	4
	19UBY2A3	Ancillary Zoology Practical (Non-Semester Pattern) Paper I & II	2	3	40	60	100	2
IV	19EVS201	Environmental Studies (EVS)	2	2	-	50	50	2
	19HEC202	HE – Family values SKY Yoga practice –II	1	2	25	25	50	1
V		Extension activities						

		(See Annexure –I)						
							700	23
	Semester III							
I	19UTL303	Tamil/ Hindi Paper – III	5	3	25	75	100	3
II	19UEN303	English Paper – III	6	3	25	75	100	3
III	19UZY304	Core Major Paper –IV Cell Biology	7	3	25	75	100	4
		Major Practical – II (Non-Semester Pattern) Cell biology & Genetics	2	3	-	-	-	-
	19UZY3A4	Ancillary Chemistry Paper – I	6	3	25	75	100	4
		Ancillary Chemistry Practical	2	-	-	-	-	-
IV	19UZY3N1/ 19UZY3N2	Non-Major Elective (NME) Public health and hygiene/ Ornamental fish culture/ Basic Tamil paper/ AD Tamil paper	1	2	-	50	50	2
	19HEC303	HE – (Professional values & SKY Yoga practice -III)	1	2	25	25	50	1
V		Extension activities (See Annexure –I)						
							500	17
	Semester IV							
I	19UTL404	Tamil/ Hindi Paper – IV	5	3	25	75	100	3
II	19UEN404	English Paper – IV	6	3	25	75	100	3
III	19UZY405	Core Major Paper –V Genetics	7	3	25	75	100	4
	19UZY406	Major Practical – II (Non-Semester Pattern) Cell biology & Genetics	2	3	40	60	100	4
	19UZY4A5	Ancillary Chemistry Paper – II	6	3	25	75	100	4
	19UZY4A6	Ancillary Chemistry Practical	2	3	40	60	100	2
IV	19UZY4N3 /19UZY4N 4	Non-Major Elective (NME) Food and nutrition/ Apiculture / Basic Tamil paper/AD Tamil paper	1	2	-	50	50	2
	19HEC404	HE – (Social values & SKY Yoga practice -IV)	1	2	25	25	50	1
V		Extension activities (See Annexure –I)				50	50	1
							750	24
	Semester V							
	19UZY507	Core Major Paper – VII Developmental Biology	5	3	25	75	100	4
	19UZY508	Core Major Paper – VIII Biotechnology	5	3	25	75	100	4
	19UZY509	Core Major Paper – IX Biostatistics& Biophysics	5	3	25	75	100	4
	19UZY510	Core Major Paper – X	5	3	25	75	100	5

III		Bioinformatics and Biochemistry						
	19UZY5E1/ 19UZY5E2	Core Elective Paper – I & II Medical Laboratory Technique / Poultry Science And Management Technology	4	3	25	75	100	5
		Major Practical – III (Non-Semester Pattern) Developmental Biology, Animal Physiology & Endocrinology, Biostatistics & Biophysics, Bioinformatics & Biochemistry and MLT	2	-	-	-	-	-
		Major Practical – IV (Non-Semester Pattern) Ecology, Evolution, Biotechnology, Microbiology, Sericulture and Aquaculture	2	-	-	-	-	-
IV	19UZY5S1/ 19UZY5S2	Skill Based Elective (SBE)–Online Network and Information Security Cyber security – Ethical Hacking	1	2	-	50	50	2
	19GKL501	Skill Based Elective (SBE)–Online General Knowledge & General Awareness	SS	2	-	50	50	2
	19HEC505	HE – (National values & SKY Yoga practice -V)	1	2	25	25	50	1
							650	27
	Semester VI							
III	19UZY611	Core Major Paper –XI Animal Physiology & Endocrinology	5	3	25	75	100	5
	19UZY612	Core Major Paper – XII Ecology & Evolution	5	3	25	75	100	4
	19UZY613	Core Major Paper – XIII Microbiology & Immunology	5	3	25	75	100	4
	19UZY6E3/ 19UZY6E4	Core Elective Paper-III & IV Sericulture/ Insect Pest Management	4	3	25	75	100	3
	19UZY6E5/ 19UZY6E6	Core Elective Paper –V&VI Aquaculture/ Dairy farming and management Technology	5	3	25	75	100	5
	19UZY614	Major Practical – III (Non-Semester Pattern) Developmental Biology, Animal Physiology & Endocrinology, Biostatistics & Biophysics, Bioinformatics & Biochemistry & MLT	2	3	40	60	100	4
	19 UZY615	Major Practical – IV (Non-Semester Pattern) Ecology, Evolution, Biotechnology, Microbiology , Sericulture and Aquaculture	2	3	40	60	100	4
		Skill Based Elective (SBE)	1	2	-	50	50	2

IV	19UZY6S3	Vermiculture						
	19UZY6S4	Skill Based Elective (SBE) Biopharmaceuticals						
	19 HEC606	HE – (Global values & SKY Yoga practice -VI)	1	3	25	25	50	1
							800	32
		**Grand total					3900	140


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Principal

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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19 UZY 507	Title	Batch :	2019-2022
		Core Major Paper – VII Developmental Biology	Semester	V
Hrs/Week:	5		Credits:	4

Course Objectives

- To understand the basic concepts and definitions of modern developmental biology
- Identify and define the landmark events and advances in developmental biology.
- To know about the applications and recent advances in developmental biology.

Course Outcomes (CO)

K1	CO1	To remember the steps and advancements in the developmental biology
K2	CO2	To comprehend embryonic formation and developmental stages with suitable example
K3	CO3	To apply functional knowledge on developmental biology into the frontier sciences
K4	CO4	To sort of embryonic development and its functional applications

Unit	Content	Hrs
Unit -I	- Definition-Ontogeny - Phylogeny Programme of Developmental Biology Theories Pre formation Spemann's experiments on Organizer Gametogenesis Spermatogenesis Oogenesis Fertilization Mechanism <i>InVitro Fertilization(IVF)</i> Parthenogenesis- Natural and Artificial Significance of Parthenogenesis.	13Hrs
Unit -II	Cleavage in Frog Planes (Meridional, Vertical , Equatorial and Latitudinal) Patterns of cleavage (Holoblastic and Meroblastic) Example: Cleavage in frog Gastrulation in Frog Types of morphogenic movements (Epiboly& Emboly). Example: Gastrulation in frog - Exo gastrulation Fate map - Mechanism of morphogenetic movements Cell lineage	13Hrs
Unit -III	Organogenesis in Frog -Ectodermal (Brain) -Mesodermal (Heart) -Endodermal (Alimentary canal) Development of Chick comparison of the cleavage and gastrulation of frog and chick – development of chick based on hours of incubation - Development and significance of fetal membranes in chick.	13Hrs
Unit- IV	Placentation in mammals Classification based on -Fetal membranes -Distribution of villi -Histology-Functions of placenta Neoteny types-factors affecting neoteny- Evolutionary significance Organizer structure-properties- types of induction– embryonic induction - mechanism of induction Nuclear transplantation types- techniques Metamorphosis Aspects of metamorphosis in insects and amphibians, events and hormonal control. Regeneration Types of regeneration – amphibian limb regeneration – stimulus and suppression of regeneration.	13Hrs
Unit -V	Stem cells: embryonic &adult <i>Embryonic stem cell culture and applications.</i> Multiple ovulation and embryo transfer technology (MOET).	13Hrs

	Embryonic sexing, cloning, screening for genetic disorder diagnosis (ICSI, GIFT etc.) Cloning of animals by nuclear transfer.	
Total Contact Hrs		65

➤ *Italics denoted as self study topics*

Power point Presentations, Seminar , Assignment, Discussion, Activity

Books for Study:

1. Arumugam .N. (2018) Developmental Zoology - Saras Publication,114/35G, A.R.P Camp Road, Periaivilai, Kottar Post, Nagercoil - 629002 , Tamilnadu, India, 2011
2. Veer Bal Rastogi 2017. Chordate embryology Kedar nath ram nath , 132. R.G. College road, Meerut-250 001

Books for Reference:

1. Berrill, W. J. and Graw M. C. (2010) Developmental biology - Hill Book Co, New York.
2. Wesley, (1979) An Outline of animal development – Davenport, Addison –publishers, University of Michigan.
3. Balinsky, 5th Edition, Embryology - Philadelphia, Saunders College Publishing.
4. Verma P S & Agarwal V K (2012) Chordate embryology-S Chand & Company Ltd
5. Subramoniam (2002) Developmental Biology. Narosa Publishing House, New Delhi
6. Twyman. R.M. (2001) Developmental Biology. Viva Books Private limited, New Delhi.

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	S	H
CO3	M	S	S	M	M
CO4	M	H	H	L	H

S-Strong; H-High; M-Medium; L-Low

Head of the Department

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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19UZY510	Title	Batch :	2019-2022
		Core Major Paper - X Bioinformatics and Biochemistry	Semester	V
Hrs/Week:	5		Credits:	5

Course Objectives

- To study the basic bioinformatics tools and its uses
- To acquire the knowledge on biological databases.
- To know the chemical structure of macromolecules and their metabolic activity.

Course Outcomes (CO)

K1	CO1	To keep in mind the basic bioinformatic tools and its uses.
K2	CO2	To comprehend the genomic study, phylogenetic analysis and sequence analysis
K3	CO3	To apply the basic and applied knowledge of Biochemistry

K4	CO4	To sort the core principles of biochemistry.	
Unit	Content		Hrs
Unit I	• Scope of Bioinformatics • Databases ○ Biological database (Properties and classification) ○ Specialized database • Protein sequence database – SWISS-PROT • Data mining • Virtual Library		13Hrs
Unit II	• Genomics – Definition, classification and applications • Proteomics – Definition, classification and applications • Drug designing • Human genome project ○ Goals and techniques ○ Potential benefits • <i>Bioinformatics tools and its uses</i>		13Hrs
Unit III	• Similarity tool : BLAST • Visualizing tool : RasMol • Miscellaneous tool : Webcutter • Phylogenetic analysis - Definition and applications • Construction of phylogenetic tree • Structure of rooted tree		13Hrs
Unit IV	Biochemistry • Classification of Carbohydrates: ○ Monosaccharides : Pentoses- Hexoses ○ Disaccharides: ▪ -Non-reducing sugar C1- C1-Sucrose ○ Reducing Sugar C1 – C4 -Lactose ○ Polysaccharides - Homopolysaccharide - Starch Heteropolysaccharide - Heparin • Classification of Lipids: ○ Simple Lipids - Fats and Waxes ○ Compound lipids -Phospholipids- Glycolipids ○ Derived lipids -Glycerol - Fatty acids and Cholesterol • Classification of Proteins: ○ Based on structure : Simple – Conjugated and Derived proteins. ○ Based on solubility: Globular and Fibrous proteins		13Hrs
Unit V	• Metabolism: ○ Metabolism of carbohydrates: Glycolysis-Glycogenesis- Kreb’s cycle & Glycogenolysis ○ Metabolism of lipids :β-oxidation of fatty acids ○ Metabolism of proteins :Transamination and Deamination ○ <i>Vitamins: Water soluble & Fat soluble.</i>		13Hrs
Total Contact Hrs			65

➤ *Italics denoted as self study topics*

Power point Presentations, Seminar, Assignment, group discussions, Google class room ,Case study

Books for Study:

1. Sundaralingam R.& Kumaresan V. (2015) 5th edition Bioinformatics , Saras Publication, 114/35G . A.R.P Camp road, Perivallai, Kottar PO, Nagercoil, Kanyakumari,

- Thulsi Fatima, (2016) Biochemistry - Saras Publication, 114/35G, A.R.P Camp Road, Periaivilai, Kottar Post, Nagercoil - 629002, Tamil nadu, India

Books for Reference:

- Siminder Kaur Thukral, (2007) Bioinformatics-Orpita Bosu, Oxford University Press, New Delhi 110001
- Attwood T.K. and Parrysmith D.J. (1999) Introduction to Bioinformatics - Addison Wesley Longman, Harlow.
- Fuelker, M.H. (2009) Bioinformatics – Applications in Life and Environmental Sciences Capital Publishing Company, New Delhi.
- Ignacimuthu, S. (2005) Basic Bioinformatics – Narosa Publishing House, New Delhi.
- Sharma, Munjal & Shankar (2008) A text book of Bioinformatics –, Rastogi Publications, Meerut, India,
- Jin Xiong, (2006) Essential Bioinformatics Cambridge University Press
- Subramanian C. (2010) Genomic Bioinformatics- Dominant Publisher, New Delhi.
- Rastogi, S. C. (1995) Biochemistry - Tata McGraw-Hill Education,
- Sathyanarayana U. & Chakrapani, U. (2009) 2nd Edition, Essential of Biochemistry - Books & Allied pvt.ltd 83/1, Beliaghata main road, Kolkata 700010, India

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M
CO4	M	H	H	H	H

S-Strong; H-High; M-Medium; L-Low


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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19UZY5S1	Title	Batch :	2019-2022
		Network and Information Security (SBE- Online)	Semester	V
Hrs/Week:	1		Credits:	2

Course Objective

- To impart knowledge of Network security, Wi-Fi security, hackers, secure networking and password managers.

Course Outcomes (CO)

K1	CO1	To remember the basic concepts of network
K2	CO2	To understand the network hacking techniques
K3	CO3	To deploy information and network security
K4	CO4	To interpret the common threats today in computer network

Unit	Content	Hrs
Unit I	Basics of Network – Network Media – Various Operating Systems – Basics of Firewalls on all Platforms including Windows, MacOS and Linux.	3Hrs
Unit II	Security Vulnerabilities across an entire network – Network Hacking techniques and Vulnerability scanning.	3Hrs
Unit III	Configure and architect a small network for physical and wireless security – Firewalls configuration on Windows platform and Linux platform. Network privacy issues	2Hrs
Unit IV	Network monitoring to discover and identify potential hackers and malware using tools like WIRESHARK and SYSLOG. Online tracking by hackers	2Hrs
Unit V	Best methods of authentication including passwords, multifactor authentication including soft tokens and hard tokens. Best password managers to use – how passwords are cracked – how to mitigate the password attacks.	3Hrs
Total Contact Hrs		13

Google classroom

Reference:

Course Materials will be made online through NGM Open source learning platforms

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	M	H	S
CO2	H	M	H	H	H
CO3	M	H	H	M	M
CO4	M	H	H	H	H

S-Strong; H-High; M-Medium; L-Low

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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19UZY5S2	Title	Batch :	2019-2022
		Cyber security – Ethical Hacking (SBE – Online)	Semester	V
Hrs/Week:	1		Credits:	2

Course Objective

- To understand the basics of cyber security and how ethical hacking is done on Cyber space and how to secure and protect them like security experts

Course Outcomes (CO)

K1	CO1	To remember the basic concepts of cyber security
K2	CO2	To understand the knowledge about ethical hacking
K3	CO3	To deploy the use of hacking tools
K4	CO4	To analyze the details about internet connection

Unit	Content	Hrs
Unit I	To Understand how websites work, how to discover and exploit web application vulnerabilities and to gain full control over websites. Secure systems from all the known attacks. Secret tracking and hacking infrastructure.	3Hrs
Unit II	Ethical hacking in Cyber space - its fields and the different types of hackers. Hack & secure both Wi-Fi & wired networks	3Hrs
Unit III	Discover vulnerabilities & exploitation of hacking in cyber network servers. How secure systems are hacked using client-side and social engineering attacks. Use of hacking tools such as Metasploit, Aircrack-ng, SQLmap.....etc.	2Hrs
Unit IV	Network basics & how devices interact inside a network - Network Penetration. Control connections of clients in network by password cracking. Fake Wi-Fi network creation with internet connection and spy on clients. To Gather detailed information about clients and networks like their OS, opened ports etc.	2Hrs
Unit V	Explore the threat landscape - Darknets, dark markets, zero day vulnerabilities, exploit kits, malware, phishing and much more. Master defenses against phishing, SMShing, vishing, identity theft, scam, cons and other social engineering threats.	3Hrs
Total Contact Hrs		13

Google classroom

Reference:

Course Materials will be made online through NGM Open source learning platforms

Mapping

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	H	S
CO2	H	M	H	M	H
CO3	M	H	M	M	M
CO4	M	M	H	H	H

S-Strong; H-High; M-Medium; L-Low

Head of the Department

Dr. S. SOMASUNDARAM M.Sc., Ph.D.,
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Principal

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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19UZY 611	Title	Batch :	2019-2022
		Core Major Paper – XI Animal Physiology and Endocrinology	Semester	VI
Hrs/Week:	5		Credits:	5

Course Objectives

- The complete understanding of all the chemical process associated with living cell
- To study the basis for various organ systems in the animal kingdom
- To understand the mechanism of hormonal actions

Course Outcomes (CO)

K1	CO1	To remember the bio chemical and physiological structure and activity of individual cell level
K2	CO2	To comprehend physiological activity of organ system and bio chemical activity of cells
K3	CO3	To apply functional knowledge on various organs, endocrine glands and its status
K4	CO4	To sort of animal is physiology and endocrinology

Unit	Content	Hrs
Unit- I	• Digestion ○ Functional anatomy of digestive system ○ Digestion and absorption. ○ Neuroendocrine regulation of gastro – intestinal movements and secretions. • Respiration: ○ Aerobic & Anaerobic respiration ○ Respiratory pigments in animals ○ Transport of gases - O₂ and CO₂ • Circulation: ○ Myogenic & Neurogenic heart ○ Pacemaker and electrical activity of heart in man ○ Composition and functions of blood ○ <i>Composition and functions of Lymph</i>	13Hrs
Unit- II	• Water Balance: ○ Osmotic and Ionic regulations in aquatic animal (Fish) • Receptors: ○ Chemoreceptors - Gustatoreceptors & ○ Olfactoreceptors ○ Photoreceptor (Eye) ○ Phonoreceptor (Ear) • Effectors: ○ Types of muscles : Striped- unstriped and cardiac muscles ○ Structure and properties of striped muscle ○ Mechanism of muscular contraction- sliding filament theory.	13Hrs
Unit -III	• Nervous system: ○ Structure of vertebrate neuron ○ Conduction of nerve impulse through : Non-myelinated neuron Synapse ○ Neuromuscular junction ○ Reflex action and reflex arc • Excretion: ○ <i>Structure of mammalian kidney</i> ○ Structure of Nephron	13Hrs

	○ Synthesis of ammonia - urea and uric acid ○ Formation of urine in Human ● Reproductive system: ○ Male and female reproductive system structure ● Sexual cycle in human: ○ Puberty ○ Spermiation ○ Ovulation ○ Menstrual cycle ○ Pregnancy and Parturition.	
Unit- IV	● Scope of Endocrinology ● Endocrine glands (Structure & Functions) ○ Pituitary ○ Thyroid ○ Parathyroid ○ Pancreas ○ Testes & ovary ● Hormonal interactions- Feedback control mechanisms.	13Hrs
Unit- V	● Mechanism of hormone action: peptide, steroid & thyroid. ● Hormonal disorders: ○ Pancreas (Diabetes mellitus) ○ Thyroid (Goiter) ○ Pituitary (Gigantism - Dwarfism) ○ Sex hormones (Infertility).	13Hrs
Total Contact Hrs		65

➤ *Italics denoted as self study topics*

Power point Presentations, Seminar , Assignment, Discussion, Activity, Case study, Google classroom

Books for Study:

1. Arumugam N. (2017) Animal physiology- Saras Publication, 114/35G, A.R.P Camp Road, Periaivilai, Kottar Post, Nagercoil - 629002 , Tamil nadu, India
2. Rastogi S.C. (2008) Essentials of Animal Physiology, 4th Edition . New age international publishers.

Books for Reference:

1. Parameswaran, Ananthakrishnan& Ananthasubramaniam, (1991) Outline of animal physiology - S. Viswanathan printers & Publishers Pvt. Ltd.
2. Verma, P. S ., Tyagi and Agarwal. (1997) Animal physiology - Chand& company ltd
3. S. Sree Kumar, (2010) Basic Physiology –PHI Learning Pvt. Ltd, New Delhi, 110001, Edition.
4. Berry, A.K. A text book of Animal Physiology –EMKAY Publication, New Delhi-110051
5. Sreekumar S. (2010) Edition. Basic Physiology –, PHI Learning Pvt. Ltd, New Delhi.
6. Sastry, K.V. (2009-2010) Endocrinology & Reproductive Biology –Rastogi Publications, Shivaji road, Meerut-250002, India.
7. Prakash S. Lohar. (2005) Endocrinology. MJP Publishers, Chennai.

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Programme code:	B. Sc	Programme Title :	Zoology	
Course Code:	19UZY 6E6	Title	Batch :	2019-2022
		Core Elective Paper–VI Dairy Farming and Management Technology	Semester	VI
Hrs/Week:	5		Credits:	5

Course Objectives

- To know about the basic processing technology in dairy farm.
- To get idea about manufacturing technology of Ice-cream and frozen desserts
- To understand the physico chemical properties of dairy products.

Course Outcomes (CO)

K1	CO1	To keep in mind the dairy by-products
K2	CO2	To deduce the Breeding practices in dairy farm
K3	CO3	To apply the knowledge in Production of condensed and dried milks
K4	CO4	To sort of the Food safety and quality assurance.

Unit	Content	Hrs
Unit- I	• Scope of dairy farming • Dairy progress in India • Milk and Milk Products • Nutritive value of milk • ICMR recommendation of nutrients • Milk production in India and Tamil Nadu • Role of milk and milk products in human nutrition.	13Hrs
Unit -II	QUALITY ANALYSIS OF MILK: • Determination of Specific gravity, fat, Acidity & pH in milk • Significance of milk • Determination and significance common adulterants in milk and their detection techniques • Advanced analytical techniques in milk and milk products.	13Hrs
Unit -III	DAIRY HUSBANDRY: • Dairy Cattle Breeds • Indigenous and exotic Breeds – Dairy Cattle – Anatomy • Nutrition – Physiology – Genetics and Breeding – A1 • Health and Hygiene Vaccination schedule	13Hrs
Unit- IV	DAIRY CHEMISTRY: • Milk Composition • Physico Chemical properties of milk • Animal, Feed and Environmental factors influencing the composition of milk • Milk lipids, Proteins, Sugar , Minerals and vitamins DAIRY MICROBIOLOGY:	13Hrs

	• Milk and microbes – Common micro organisms in milk spoilage of milk • Fermentation of milk - Desirable and undesirable fermentation • Milk borne diseases • Clean milk production	
Unit -V	DAIRY PROCESSING AND TECHNOLOGY: • Dairy processing – Milk collection, transportation & Grading of milk • Standardization – Pasteurization – Homogenization of milk - packaging of milk – cleaning and sanitation • Butter – ghee and Ice cream • Concentrated and dried milk products • Cheese and other fermented products • Indigenous milk products • Effective utilization of dairy by - products	13Hrs
Total Contact Hrs		65

Reference Books

1. Banarjee G.C (1998) A Text book of Animal Husbandry S.CHAND Publications, Oxford & ibh Publishing Pvt. Ltd.

Books for Reference

1. Varnam, A., Sutherland, Jane P. (1994) Milk and Milk Products Technology, chemistry and microbiology publishers, Springer, U.S.
2. Lampert. (1998) Modern Dairy Products Chemical Publishing Co Inc.,U.S.; 3 edition
3. Gupta P.R. Dairy India Year Book – (2007 b)
4. Schmidt G. H., Van vleek L. D. and Hutjens M. F. (1988) Principles of Dairy Science Subsequent edition
5. Eiri Board (2008) Handbook of Dairy Farming: To Produce Milk with Packaging Engineers India Research Institute.
6. John L. Curtis (1992) Cattle Embryo Transfer Procedure Academic Press Inc.

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