VIVEKANANDA COLLEGE

(Residential & Autonomous – A Gurukula Institute of Life-Training)

(Affiliated to Madurai Kamaraj University)

(Re-accredited with 'A' Grade [CGPA 3.59 out of 4.00] by NAAC)

TIRUVEDAKAM WEST, MADURAI DISTRICT – 625 234

POST GRADUATE AND RESEARCH DEPARTMENT OF ZOOLOGY

B.Sc. ZOOLOGY

SYLLABUS

Choice Based Credit System

(For those who join in June 2015 and after)

ABOUT THE COLLEGE

Vivekananda College was started by Founder-President Swamiji Chidhbhavanandhaji Maharaj of Sri Ramakrishna Tapovanam, Tirupparaithurai, Trichy in 1971 on the banks of the river Vaigai which is blissfully free from the noise and hurry, the crowds and distraction of the city.

Vivekananda College is a residential college functioning under Gurukula pattern. It is Man-making education, that is imparted in this institution, Culture, character and curriculam are the three facets of ideal education that make man a better man. This is possible only when the teacher and taught live together, The Gurukula system of Training is therefore a humble and systematic attempt in reviving the age old GURUGRIHAVASA for wholesome education, Attention to physical culture, devotion to duty, obedience to teachers, hospitality to guests, zest for life, love for the nation, and above all, humility and faith in the presence of God etc. are the values sought to be inculcated. All steps are taken to ensure the required atmosphere for the ideal life training.

Vivekananda College, Tiruvedakam West, Madurai District-625 234 is an aided college established in 1971 and offers UG and PG courses. This College is affiliated to the Madurai Kamaraj University, Madurai. The College was reaccredited with 'A' grade (CGPA 3.57 out of 4.00) by NAAC IN March 2010.

VISION AND MISSION

Our Vision: To raise an army of neo-graduates steeped in the hoary culture of the motherland and dedicated to serving her as potential leaders in the manifold spheres of national effort.

Our Mission: A harmonious enrichment of physical, emotional and intellectual facets of a student's personality to bring out his inherent PERFECTION.

OBJECTIVES OF THE INSTITUTION

1. To inculate spiritual, ethical, moral and social values in all disciplines of study.
2. Simultaneous education of the Hand, Heart and Head. Only a sound body can hold a sound mind.
3. Provide opportunities for all round development of the students and excellence in higher education, research and extension in different disciplines.
4. Disseminate the findings of research to the community to facilitate its development.
5. To provide society citizens of sterling character.
6. To cater to the needs of the educationally backward people – the most backward, scheduled caste and tribe.

GURUKULA ADMINISTRATIVE SET UP

Secretary	**Swami Niyamananda Maharaj**
Principal	**Dr. B. Ramamoorthy**
Vice-Principal & NAAC Coordinator	**Dr. S. Raja**
Academic Affairs	**Dr. M. Ganesan**
Controller of Examinations	**Dr. E. Jayakumar**
IQAC Coordinator	**Dr. S.Raja**
IGNOU Coordinator	**Sri. V. Parthasarathy**
ICT Coordinator	**Dr. N.Nagendran**
Grievence Cell Coordinator	**Dr. T. Kaliappan**
Director, Certificate Courses	**Dr. N. Nattuthurai**
Sessional Examination	**Sri. P.Muthukumaran, HOD of Maths**
	Sri. P.Natarajan
	Sri. G.Sanjeevi
	Sri. C.Rajan
	Sri. P.Madasamy

I Eligibility For Admission

Admission to B.Sc. – Zoology Programme is open to candidates with +2 pass with Maths, Physics, Chemistry, Biology, Botany and Zoology as major subjects.

For B.Sc.- Zoology course offered in the college, a pass in the Higher Secondary Examination conducted by the Government of Tamil Nadu or an examination accepted as equivalent there to by the Syndicate of the MKU, subject to such conditions as may be prescribed therefore.

II Duration

The course is for a period of three years. Each academic year shall comprise of two semesters viz. Odd and Even semesters. Odd semesters shall be from June to November and Even Semesters shall be from December to April. There shall be not less than 90 working days which shall comprise 450 teaching clock hours for each semester (Exclusive of the days for the conduct of university end-semester examinations) for each semester.

III CBCS System

All Programmes offered in the college are run on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

IV Semesters:

An academic year is divided into two semesters. In each semester, courses are offered in 15 teaching weeks. Each week has 30 working hours spread over 6 days a week.

V Credits:

The term 'Credit' refers to the weightage given to a course, usually in relation to the instructional hours assigned to it. The total minimum credits,

required for completing the B.Sc., Programme is 140. The details of credits for individual components and individual courses are given in the above table.

***VI Course*:**

Each Course is to be designed variously under lectures / laboratory / seminar / practical training / assignments to meet effective teaching and learning needs.

VII Examinations:

i). There shall be examinations at the end of each semester, for odd semesters in the month of October / November; for even semesters in April/May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course{s) in the subsequent examinations to be held in October / November or April/May.

ii). A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed or belated joining or on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after the completion of the programme.

VIII Condonation

Students must have 75% of attendance in each paper for appearing the examination. Students who have 65% to 74% of attendance shall apply for condonation in the prescribed form with the prescribed fee. Students who have 50% to 64% of attendance shall apply for condonation in prescribed form with the prescribed fee along with the Medical Certificate. Students who have below 50% of attendance are not eligible to appear for the examination. They shall compensate the shortage after the completion of the programme.

IX Question Paper Pattern

Time: 3 Hours

Maximum Marks: 75

SECTION-A (10 X 1 =10 Marks)

Answer All Questions

(1-5) Multiple Choice

(6-10) Short Answer Questions

Two questions from each unit

SECTION-B (5 X 7 = 35 Marks)

Answer All Questions

(11-15) Questions shall be in the format of either (a) or (b)

One question from each unit

SECTION-C (3 X 10 = 30 Marks)

Answer any THREE Questions

(16-20) One question from each unit.

X Evaluation:

Performance of the students are evaluated objectively. Evaluation is done both internally and externally. They will be assessed continuously through Internal Assessment System and finally through summative (end) semester examination. To assess internally, there will be three examinations conducted centrally with a

duration of two hours for each paper. In addition to continuous evaluation, the summative semester examination, which will be a written examination of three hours duration, would also form an integral component of the evaluation. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 25 : 75.

The pattern of internal valuation shall be:

Test: 20 Marks (the average of best two tests out of three tests)

Assignment: 5 marks

Total: 25 marks.

In respect of practical papers, the ratio of marks to be allotted to internal assessment and to summative (end) semester examination is 40 : 60. The internal marks will be calculated on the basis of marks secured at the model examination and marks awarded for the preparation of practical note book. The external marks will be calculated on the basis of the marks awarded by the internal examiner and the external examiner at the summative semester examination.

XI Passing Minimum:

There is no passing minimum for Internal Assessment. The passing minimum for external Examinations shall be 27 out of 75 marks and passing minimum for a paper is 40%.

XII Classification of Students:

Candidates who have secured not less than 40% of marks in each paper shall be declared to have passed in that paper. Candidates who obtain 40% and above but below 50% shall be declared to have passed in Third Class. Candidates who obtain 50% and above but below 60% of the aggregate marks in Part-III shall be declared to have passed in Second Class and those who obtain 60% of marks and above shall be placed in the First Class. Candidates who obtain 75% and above shall be declared to have passed in Distinction provided he has not re-appeared for any paper during the course of the study.

XIII Failed Candidates:

A candidate who has arrears in any paper in a semester examination will be permitted to proceed to the next semester classes. A candidate who has arrears may appear again in these failed papers at the November/April examinations. The internal assessment marks already obtained by him shall be carried over for the subsequent appearance also.

XIV Improvement of Internal Marks:

The student desirous of improving the internal assessment marks may request the Head of the Department. After obtaining permission from the Staff Council Meeting by the Head, the student may write improvement examinations in consultation with the course teacher. The marks obtained (when it is more than the previous marks) will be submitted to the Controller of Examinations for further adoption.

XV Study Tour

Students are expected to participate in the field visit and the study tours organized by the department. Though study tour/field trip carries no credit, it is compulsory for the students to attend whereby the students can get an opportunity to gain practical knowledge. As such, observational visit to selected social welfare organizations, industries, trade centres, exhibitions, places of historical importance and the like will be considered as extra-curricular activities.

Post Graduate and Research Department of Zoology

The Department of Zoology, Institutional Member of International Society for Zoological Sciences (ISZS), Beijing, China since 2009 was started on **21st June 1971** to teach biology for pre-university students. **B.Sc. Zoology Degree course** was started during the academic year 1973 – 74 and **M.Sc. Zoology** Post-graduate course in the year 1987 – 1988 and **M.Phil. Course** in 2007 – 2008. In the year 2009 the Madurai Kamaraj University recognized the Department as **Research Center in Zoology** for pursuing PhD. B.Sc. Zoology and M.Sc. Zoology are renamed and the syllabus is modified in tune with the syllabus proposed by the Tamil Nadu State Higher Education during the year 2008-2009. The change in name was approved by the committee formed by Madurai Kamaraj University. Now the Department has collaborations and academic interactions with industries, national and international universities/institutes. The Department had the unique distinction of having eminent teachers ever since its inception. Prof. A. Mani, Dr. R. Sugumaran, Prof K. Chandran and Prof. S. Srinivasan have served as the Heads of the Department from 1974-2012. In tune with the legacy, at present the Department has an exceptional feature of having well experienced teachers with high teaching potential. Now there are nine faculty members headed by Dr.P.Rajendran, among whom five have obtained their doctoral titles and others are pursuing their research work for their doctoral degree.

Vision

- Unravel hidden research potentials & Entrepreneurial avenues in Zoology
- Bring a behavioral change in subject knowledge, scientific aptitude and instrumental skills to attract students with best caliber
- Raise students to international standards

Mission

- Strategic plans for translating goals and objectives by curriculum design, good teaching methods and evaluation
- Academic and research collaborations
- Bio track-A forum to update knowledge
- Hands on training at Bio industries

Objectives

- Motivate scientific aptitude and skill development to pursue higher studies with excellence in research
- Bio-based industrial hands on training to develop entrepreneurial skills for self-employment
- Dissemination of research findings and cater the needs of the society

Department Highlights

- ❖ Academic and research collaborations with **International Universities**
- ❖ HOD of Zoology **Dr.P,Rajendran -** Joint Secretary of **International Shalihotra Committe** affiliated and recognized by International Bourgelat Committee, **France-**2014

- Department accreditation - **VetAgro Sup Campus Vétérinaire,** 1, avenue Bourgelat , 69280 Marcy l'Etoile, France for the World Veterinary Year Celebrations 2011
- Corporate member-**International Society of Zoological Sciences (ISZS), China-**2009
- Research project with **Ryukyus University, Okinawa, Japan- 2006-07**
- The **Department of Biotechnology**, New Delhi and **Tamil Nadu State Council for Science and Technology** have recognized the department to conduct Research Projects
- **The Indian Academy of Sciences,** Bangalore, **Indian National Science Academy**, New Delhi and the **National Academy of Sciences,** Allahabad, had conducted **Lecture- workshop** for Academicians, Students and Research Scholars.-2008
- **UGC** sponsored **Refresher course on Rural Biotechnology** besides organizing many Symposia/ Workshop at the regional level every year.
- The Madurai Kamaraj, Karpagam, Bharathiar, Mother Theresa and the Manonmaniam Sundaranar Universities have recognized the department to conduct **Research programmes** under the guidance of the faculties.
- The principal areas of research- Sericulture, Vermiculture, Microbial bioremediation, Biodiversity, Toxicology and Bio-control of Insect pests.
- More than **50 research papers** in reputed National and International journals.Written books in Microbiology, Microbial bioremediation, Biophysics, Biochemistry and Research Methodology in leading National publishing companies.
- International Science organization **Science Advisory Board,** Wilson Boulevard, Suite 250. Arlington, VA 22201 and National organization, **ENVIS,** Madras University has recognized our faculties as their members.
- Our faculties are recognized as International and National **resource persons** in their respective fields.
- **The Tamil Nadu State Government** has recognized the faculties of the Department by conferring **State Government Award.**
- **Under Graduate and Post Graduate students** of the Department have received **Best Paper Presentation Award** for Scientific Paper presentations in National Seminars.
- Faculties have received **several awards** from recognized scientific bodies and organizations

Department of Zoology
TIME TABLE

SEMESTER-I

DAY /PERIOD	I	II	III	IV	V
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					

SEMESTER-II

DAY /PERIOD	I	II	III	IV	V
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					

SEMESTER-III

DAY /PERIOD	I	II	III	IV	V
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					

SEMESTER-IV

DAY /PERIOD	I	II	III	IV	V
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					

SEMESTER-V

DAY /PERIOD	I	II	III	IV	V
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					

SEMESTER-VI

DAY /PERIOD	I	II	III	IV	V
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
SATURDAY					

SCHEME OF EXAMINIATION
(For those who join in June 2015 and After)

FIRST SEMESTER

Part	Study Component	Subject Code	Title Of The Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT11	Tamil: Ikkalak Kavithaiyum Urainadaium	6	3	25	75	100
	Sanskrit	P1LS11	Fundamental Grammar & History of Sanskrit Literature – I					
II	English	P2LE11	Communicative English Spoken English – I	5 1	2	25	75	100
III	Core	09CT11	Invertebrates – I	4	4	25	75	100
	Core	09CT12	Invertebrates – II	4	4	25	75	100
	Core	09CP13	Practical –I	2		-	-	-
	Allied	07AT01	Allied Paper Inorganic, Organic and Physical Chemistry-I	4	4	25	75	100
	Allied		Allied: Practical-I: Volumetric Estimation	2	-	-	-	-
IV	Non Major	09NE11	Human Anatomy	2	2	25	75	100
			TOTAL	**30**	**19**			

SECOND SEMESTER

Part	Study Component	Subject Code	Title Of The Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT21	Tamil: Ikala Ilakkiyamum Makkal Thagavaliyalum.	6	3	25	75	100
	Sanskrit	P1LS21	Poetry, Grammar & History of Sanskrit Literature – II					
II	English	P2LE21	Functional English	5	2	25	75	100
	English	P2LE22	Spoken English-I	1	1	100	--	100
III	Core	09CT21	Chordates-I	4	4	25	75	100
	Core	09CT22	Chordates-II	4	4	25	75	100
	Core	09CP23	Practical – I	2	4	40	60	100
	Allied	07AT02	Allied paper-II Inorganic, Organic and Physical Chemistry-II	4	4	25	75	100
	Allied	07APO3	Allied :Practical –I	2	1	40	60	100
IV	Non Major	09NE21	Food and Nutrition	2	2	25	75	100
			TOTAL	**30**	**25**			

THIRD SEMESTER

Part	Study Component	Subject Code	Title Of The Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT31	Kappiyamum Pakthi Ilakiyamum Nadakamum	6	3	25	75	100
	Sanskrit	P1LS31	Prose, Poetics & History of Sanskrit Literature-II					
II	English	P2LE31	English through Drama & Poetry Spoken English – II	4 1	2	25	75	100
III	Core	09CT31	Cell Biology	4	4	25	75	100
	Core	09CT32	Genetics	5	5	25	75	100
	Core	09CP33	Practical-II	2	-	-	-	-
	Allied	08AT01	Allied paper-I : Plant Diversity	4	4	25	75	100
	Allied		Allied: Practical	-	-	-	-	-
IV	Skill Based	09SB31	Public Health and Hygiene	2	2	25	75	100
			TOTAL	**30**	**20**			

FOURTH SEMESTER

Part	Study Component	Subject Code	Title Of The Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
I	Tamil	P1LT41	Sanga Ilakkiyamum Neethi Ilakkiyamum	6	3	25	75	100
	Sanskrit	P1LS41	Drama and History of Sanskrit Literature – IV					
II	English	P2LE41	English through classiscs	4	2	25	75	100
	English	P2LE42	Spoken English – II	1	1	100	--	100
III	Core	09CT41	Developmental Biology	4	4	25	75	100
	Core	09CT42	Physiology	5	5	25	75	100
	Core	09CP43	Practical II	2	4	40	60	100
	Allied	08AT02	Taxonomy of Angiosperms & Plant Physiology	4	4	25	75	100
	Allied	08CP03	Allied : Practical-II	2	2	40	60	100
IV	Skill Based	09SB41	Clinical Lab Technology	2	2	25	75	100
			TOTAL	**30**	**27**			

FIFTH SEMESTER

Part	Study Component	Subject Code	Title Of The Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
II	English	P2LE51	English for Career Development	1	1	100	--	100
III	Core	09CT51	Biochemistry & Biophysics	7	5	25	75	100
	Core	09CT52	Biotechnology	7	5	25	75	100
	Core		Practical III	4	-	-	-	-
	Elective	09EP51	Biostatistics, Computer Appl & Bioinformatics	7	5	25	75	100
IV	Skill Based	09SB51	Sericulture	2	2	25	75	100
	ES	ESUG51	Environmental Studies	2	2	25	75	100
			TOTAL	**30**	**20**			

SIXTH SEMESTER

Part	Study Component	Subject Code	Title Of The Paper	Hours	Credit	Sessional Marks	Summative Marks	Total
II	English	P2LE61	English For Professional Excellence	1	1	100	--	100
III	Core	09CT61	Evolution	5	5	25	75	100
	Core	09CT62	Microbiology and Immuology	5	5	25	75	100
	Core	09CP63	Practical III	2+2	4	40	60	100
	Elective	09EP61	Dairy Farming	3	3	25	75	100
	Elective	09EP62	Environmental Biology	4	2	25	75	100
IV	Skill Based	09SB61	Fish culture	2	2	25	75	100
	Skill Based	09SB62	Vermitechnology	2	2	25	75	100
	Skill Based	09SB63	Zoology for Competitive Examination	2	2	25	75	100
	VE	VEUG61	Value Education	2	2	25	75	100
V	EA	EAUG61	Extension Activities		1	--	100	100
			TOTAL	**30**	**29**			

Total Number of Hours : 180
Total Number of Credits : 140

FACULTY MEMBERS

Dr. P. RAJENDRAN, M.Sc., M.Phil., Ph.D.,
Head, Associate Professor of Zoology

Dr. N. NATTUTHURAI, M.Sc., Ph.D.,
Associate Professor of Zoology

Dr. M. SHUNMUGAVELU, M.Sc., M.Phil., Ph.D., FAZ., FZSI., FRES(London)
Associate Professor of Zoology

Dr. E. JAYAKUMAR, M.Sc., Ph.D.,
Associate Professor of Zoology

Sri V. PARTHASARATHY, M.Sc., M.Phil., M.A., B.L.,
Associate Professor of Zoology

Dr. G. PONRAJ, M.Sc., M.Phil., Ph.D.,
Associate Professor of Zoology

Sri R. MUTHUPPANDI, M.Sc., M.Phil.,
Assistant Professor of Zoology

Dr. K. RAMESH KUMAR, M.Sc., M.Phil., B.Ed., Ph.D.,
Assistant professor of Zoology

Dr. N.M. PAVUNRAJ, M.Sc., Ph.D.,
Assistant professor of Zoology

Dr. T. RAMESH, M.Sc., Ph.D., (FDP Substitute Teacher)
Assistant professor of Zoology

Sri K. KAMATCHI, M.Sc., M.Phil.,
Assistant professor of Zoology

முதல் பருவம்

(2015-2016ஆம் கல்வியாண்டு முதல் முதற்பருவத்தில் சேரும் மாணவர்களுக்குரிய பாடத்திட்டம்)

PART-I: Language Tamil Subject		
Subject Title: **இக்காலக் கவிதையும் உரைநடையும் - தாள்:1**		
Subject Code: **P1LT11**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative marks: **75**	Total Marks: **100**

அலகு: 1 தமிழ்ச் செய்யுள்: மரபுக்கவிதைகள்

1. பாரதியார் கவிதைகள்
   1. தமிழ் (நான்கு பாடல்கள்)
   2. அறிவே தெய்வம் (10 கண்ணிகள்)

2/ பாரதிதாசன் கவிதைகள்
   1. சஞ்சீவி பர்வதத்தின் சாரல்

3/ நாமக்கல் கவிஞர் வெ.இராமலிங்கம் பிள்ளை
   1. குருதேவர் இராமகிருஷ்ணர் (3 பாடல்கள்)

4/ கவிமணி தேசிய விநாயகம் பிள்ளை
   1. கோவில் வழிபாடு

5/ அரசஞ்சண்முகனார்
   1. மதுரை ஸ்ரீமீனாட்சியம்மைத் திருவடிப்பத்து (முதல் ஐந்து பாடல்கள்)

அலகு: 2 தமிழ்ச்செய்யுள்: புதுக்கவிதைகள்

6. அன்னை – கவிஞர் கண்ணதாசன்
7. கிழக்கு விழிக்கும் நேரம் - கவிஞர் வைரமுத்து (கொடிமரத்தின் வேர்கள்)
8. அவர்கள் வருகிறார்கள் - மு.மேத்தா – (சுதந்திர தாகம்)
9. புதுக்கவிதைகள் - க.நா.சுப்ரமண்யம் - கவிதை
10/ நாம் இருக்கும் நாடு – வாக்கு வரம் தரும் தெய்வம் -தமிழன்பன்
11 தீர்த்தக்கரையினிலே – ஒலிபெருக்கி – முருகு சுந்தரம்
12 ஹைக்கூ கவிதைகள் - க.ராமச்சந்திரன்

அலகு: 3 தமிழ் உரை நடை இலக்கியம் - சுவாமி சித்பவானந்தரின் சிந்தனைகள்

அலகு: 4 தமிழ் இலக்கணம் - எழுத்து

1. முதல் எழுததுக்கள்
2. சார்பெழுத்துக்கள்
3. மொழி முதல் எழுத்துக்கள்
4. மொழி இறுதி எழுத்துக்கள்
5. வல்லெழுத்து மிகும் இடங்கள், வல்லெழுத்து மிகா இடங்கள்

அலகு: 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும்

அ) 1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
   2. மரபுக்கவிதையின் தோற்றறும் வளர்ச்சியும்

ஆ) மரபுப்பிழை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல் - பிழையற்ற தொடரைத் தேர்ந்ததெடுத்தல் - ஒருமை பன்மை மயக்கம் – ஒரு எழுத்து ஒரு மொழிக்குரிய பொருள் - ஒலி வேறுபாடுகளும் பொருள் வேறுபாடுகளும் - பொருத்தமான பொருள் - பொருத்தமான தொடர்

பாடநூல் - தமிழ் செய்யுள் தொகுப்பு

சுவாமி சித்பவானந்தரின் சிந்தனைகள். – தமிழ்த்துறை வெளியீடு
தமிழ்ச் செய்யுட் தொகுப்பு – தமிழ்த்துறை வெளியீடு

பார்வை நூல்:

தமிழ் இலக்கிய வரலாறு – **பாக்யமேரி**
தமிழ் இலக்கிய வரலாறு – **எம்.ஆர்.அடைக்கலசாமி**

SEMESTER – I
(For those who join in June 2015 and after)

PART - I Sanskrit Paper I		
Subject Title **: Fundamental Grammar & History of Sanskrit Literature – I**		
Subject Code: **P1LS11**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

FUNDAMENTAL GRAMMER & HISTORY OF SANSKRIT LITERATURE -I
Following portions for Grammar:

Declension of the following nouns and pronouns:

a) Akarantha
   Akarantha Mascular, Akarantha Famine & Akarantha Neuter.
b) Asmad and Yusmad Sabdas

Conjugation of the following verbs in present, past & future tense
Bhava, Pada, Vada, Gacha, Vasa, Dris (Pas) Krida, Dhava.
History of Sanskrit Literature:

a) Vedas and Puranas
b) Itihasa
c) Court Epics – Mahakavyas

Translation:

a) From Sanskrit to English:
   Passages exercises 2, 3 and 4 from the prescribed texts.
b) From English to Sanskrit:
   Passages exercises 1, 2 and 3 from the prescribed texts.

The prescribed text: "SAHITHYA RASA KANAH"
(Published by A.M.G. Publications, Madurai – 625 016)
Sanskrita Sri Patamala Book 1: Publication: Sanskrit Educational Society,
Madras – 18.
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016)

SEMESTER – I
(For those who join in June 2015 and after)

PART II – Paper I		
Subject Title **: Communicative English**		
Subject Code:**P2LE11**	Hours per week: **5**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives: Total number of hours per semester: **75 Hrs**

- *To develop listening and speaking skills*
- *To increase the vocabulary of students*
- *To improve reading skills*
- *To develop competency in grammar*
- *To develop continuous writing*

Unit – I - Listening, Speaking and Reading Components **15 Hrs**

1. Rabindranath Tagore – Cabuliwallah
2. Khushwant Singh – Karma
3. R.K. Narayan – Sweets for Angels
4. Premchand – The Golden Watch

Unit – II

- Sentences, Clauses, and Phrases
- Parts of Speech
- Nouns
- Pronouns
- Determiners
- Articles
- Adjectives
- Verbs
- Adverbs
- Some Common Adjectives and Adverbs

Book: ***A Textbook of English Grammar and Usage*** **by K.V.Joseph** (Page. No.1-184) Second Edition (2012), TATA McGraw Hill Education Private Limited, New Delhi.

Unit – III Composition **15 Hrs**

- Letter writing – Formal Letters & Informal Letters
- Descriptive Writing – General topics (Paragraph)

Unit – IV - Extensive Reading: Short Stories **15 Hrs**

- Young Naren - by Brahamachari Amal. [From "A Simple life of Swami Vivekananda" Advaita Ashrama, Kolkata.
- A Story of Initiation - by Sri Aurobindo Society. From "Stories and Anecdotes from the Mother" Pondicherry.
- Glory At Twilight - Bhabani Bhattacharya
- The Martyr's Corner- R.K. Narayan

Unit – V - Translation **15 Hrs**

Translation of Sentences and Stories from Tamil to English / English to Tamil (Passages will be supplied)

SEMESTER – I

(For those who Join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Invertebrates-I**		
Sub Code: **09CT11**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks:**100**

Objectives

- *Acquire knowledge on general characteristics and classification of Invertebrates*
- *Study organization of various organs and organ systems*

UNIT I: Phylum Protozoa

General Characters of the phylum and classification up to class level

Type study : Paramecium

General topics : a) Locomotion in protozoa b) Nutrition in protozoa c) Etiology and life cycle of protozoan parasites of man (Entamoeba, Plasmodium and Trypanosoma)

UNIT II: Phylum Porifera

General characters of the phylum and classification up to class level

Type study : Ascon sponge

General topics : a) Canal system in sponges b) Spicules of sponges. c) Reproduction in sponges

UNIT III: Phylum -Coelenterata

General characters of the phylum and classification up to class level

Type study : Obelia

General topics : a) Polymorphism in hydrozoa b) Coral reefs c) Ctenophora Structure and affinities

UNIT IV: Phylum Platyhelminthes

General characters of the phylum and classification upto class level.

Type study : *Fasciola hepatica*

General topics : a) Origin of metazoa b) Origin of bilateria

UNIT V: Phylum Aschelminthes

General characters of the phylum and classification up to class level

Type study : Ascaris

General Topics : a) Helminthes parasites - Enterobius and Wucheraria - Disease and control
b) Parasites adaptations in Helminthes.

Text Book

Jordan, E.I. and Verma, P.S. 2014 – Invertebrate Zoology, Chand& Co Limited, New Delhi.

References:

- Pechenik, Jan A 2014 – Biology of the Invertebrates, Tata Mcgraw – Hill Pub. Company Ltd., New Delhi
- Vasantika Kashyap, 2013, Life of Invertebrates, Second Revised Edition, Vikas Pub. House Pvt. Ltd., New Delhi
- Kotpal, R.L. 2012. Modern Text Book of Zoology, Invertebrates (Animal diversity – I), Rastogi Publications, Meerut
- Barnes, R.D. 2006,Invertebrate Zoology, IV Edition, Holf Saunders International edition
- Ekambaranatha Ayyar and Ananthakrishnan, T.N. 2005, A manual of Zoology, volume I, Invertebrate, Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai.

SEMESTER – I

(For those who Join in June 2015 and After)

Part – III : Core Subject Theory		
Subject Title : Invertebrates-II		
Sub Code: 09CT12	**Hours per week: 4**	**Credit: 4**
Sessional Marks: 25	**Summative Marks: 75**	**Total Marks:100**

Objectives

- *Understand basic aspects of invertebrate biology with their salient features*
- *Study of animal organization, comparative anatomy and functional morphology*

UNIT I: Phylum Annelida

General characters and classification up to class level with examples.

Type study : Nereis

General topics : a) Origin of coelom and metamerism
b) Adaptive radiation in polychaetes

UNIT II: Phylum Arthropoda

General characters and classification up to class level with examples.

Type study : Prawn

General topics : a) Peripatus - structure and affinities
b) Larval forms of crustacea.

UNIT III

External characters of Scorpion, Centipedes and Millipedes

General topics : a) Social Life of Insects
b) Economic Important of Insects

UNIT IV: Phylum Mollusca

General characters and classification upto class level with examples

Type study : Pila

General topics : a) Torsion in gastropods
b) Cephalopods as advanced Molluscs

UNIT V Phylum Echinodermata

General characters and classification up to class level with examples.

Type of study : Star fish

General topic : a) Larval forms of echinoderm b) Affinities of echinoderm.

Text Book

Jordan, E.I. & Verma, P.S. 2011, Invertebrate Zoology, Chand & Company Ltd, New Delhi.

Reference

- Kotpal , R.L, 2011. Invertebrates, Rastogi Publications
- Kotpal, R.L. 2004. Modern Text Book of Zoology, Invertebrates (Animal diversity – I), Rastogi Publications, Meerut.
- Pechenik, Jan. A 2000, Biology of the Invertebrates, Tata Mcgraw – Hill Pub. Co. Ltd., New Delhi.
- Meglitsch Paul. A 1972. Invertebrate Zoology, Second Edition, Oxford University Press, London.
- Barrington, E.J.W. 1967 – Invertebrate Structure and Function. The English Language Book, Society, London.

SEMESTER – I

(For those who join in June 2015 and after)

PART III – Allied Course Theory		
Subject Title **: Inorganic, Organic and Physical Chemistry**		
Subject Code:07AT01	Hours per week:4	Credit:4
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

To enable the students

- *To become familiar in to the basic Principles Of Titrimetry*
- *To gain basic knowledge about Organic basic principles*
- *To have gain the basic concept of intermediates*
- *To be familiar with catalysis*

UNIT I: GENERAL PRINCIPLES OF TITRIMETRY 12 Hrs

Concept of Molecular weight, Formula weight, Equivalent weight – Concentrations of solutions – Molarity, Normality, Weight percentage. Principle of Titrimetry – Primary and secondary standards – Preparing standard solutions – Standardising the secondary standard solutions.

UNIT II: ORGANIC BASIC PRINCIPLES I 12 Hrs

Empirical formula – molecular formula – structural formula – Calculation of Empirical Formula and Molecular Formula from percentage composition. Isomerism – Structural isomerism – Chain isomerism – Position isomerism – Functional isomerism – Metamerism – Stereoisomerism.

UNIT III: ORGANIC BASIC PRINCIPLES II 12 Hrs

Nucleophiles – Electrophiles: Definition, types and examples. Types of reactions: Substitution – Addition – Elimination – Rearrangement and Polymerization – illustration with examples. Resonance and tautomerism.

UNIT IV: ORGANIC INTERMEDIATES 12 Hrs

Nature of valency of carbon in organic compounds – Tetrahedral arrangement of valency of carbon – bond breaking and bond forming in organic reactions – Homolytic cleavage – Heterolytic cleavage – Definition, types and examples of carbocation, carbanion and free radical.

UNIT V: CATALYSIS AND PHOTOCHEMISTRY 12 Hrs

Definition – different types of catalysis – acid base catalysis – surface catalytic reactions – definition and examples – auto catalyst –catalytic poisoning – promoters.

Definition of photochemical reactions – comparison of thermal and photochemical reactions – Chemiluminescence – Bioluminescence – Photosynthesis – Radioactivity – Applications of radioactive isotopes in biology and medicine.

TEXT BOOK

1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester – I & II.

REFFERENCE

1.Advanced Organic Chemistry by Bahl & Arun Bahl, S.Chand & Company Ltd, NewDelhi, 2012 Edition.
2.Text book of Inorganic Chemistry by P.L.Soni, Mohan Katyal,Sultan Chand & Sons, NewDelhi, 2010 Edition..
3. Essentials of Physical chemistry Arun Bahl, B.S.Bhal & G.D.Tuli, S.Chand Publishing Company, New Delhi, 2010 Edition.

SEMESTER – I

(For those who Join in June 2015 and After)

Part – IV : Non-Major Elective		
Subject Title : HUMAN ANATOMY		
Subject Code: 09NE11	**Hours per week: 2**	**Credit: 2**
Sessional Marks: 25	**Summative Marks: 75**	**Total Marks: 100**

2hrs/week-30 hrs

Objectives

- *Study of various human tissues and skeletal systems*
- *Understand structure and functions of selected organs and organ systems*
- *Highlights human reproductive system*

Unit –I

Types of Tissues, Exoskeleton – Skin and hair
Endoskeleton- Skull, fore limb and hind limb

Unit –II

Structure of Tooth and alimentary canal
Structure of Kidney and Nephron

Unit-III

Structure of lungs
Structure of heart, blood and blood groups

Unit-IV

Structure of brain
Structure of eye and ear

Unit-V

Endocrine glands and their secretions
Male and female reproductive system

Text book

Best and Taylor – 1965.The living body – Chapman & Hall, London

Reference Book:

Marieb, M. 2006. Human Anatomy & Physiology, Dorling Kindersley (India) Pvt. Ltd., Delhi.

P.S. Verma and V. K. Agarwal 1985. Animal physiology, S. Chand & Company, New Dlhi.

இரண்டாம் பருவம் - பாடத்திட்டம்

(2015-2016ஆம் கல்வியாண்டு இரண்டாம் முதற்பருவத்தில் சேரும் மாணவர்களுக்குரிய பாடத்திட்டம்)

PART-I: Language Tamil Subject		
Subject Title: **இக்கால கதை இலக்கியமும் மக்கள் தகவலியலும் - தாள்:2**		
Subject Code: **P1LT21**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative marks: **75**	Total Marks: **100**

அலகு: 1 தமிழ்ச் சிறுகதை இலக்கியம் - சிறுகதைகள் பத்து

அலகு: 2 தமிழ் நாவல் இலக்கியம் - துணிந்தவன்

அலகு: 3 மக்கள் தகவலியல் - பாடப்பகுதிகள்

1. இதழியல் வளர்ச்சி வரலாறு
2. செய்தித்தாளின் அடிப்படை வரலாறு
3. இந்திய இதழியல் - தொடக்க காலம்
4. 19ஆம் நூற்றாண்டில் இந்திய இதழியல்
5. இந்திய விடுதலை இயக்கமும் இதழ்களும்
6. இதழ்கள் தொடங்குவதற்குரிய வழிமுறைகள்
7. செய்தித்தாள் நிர்வாக அமைப்பு

அலகு: 4 தமிழ் இலக்கணம் - சொல்

1. நான்கு வகைச் சொற்கள்
2. வினா – விடை வகைகள்
3. வேற்றுமைகள்
4. தொகைகள் - வேற்றுமைத் தொகை, வினைத்தொகை, பண்புத்தொகை. உவமைத்தொகை. உம்மைத்தொகை. அன்மொழித்தொகை

அலகு: 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்

அ) 1. சிறுகதையின் தோற்றமும் வளர்ச்சியும்

2. புதின இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்

ஆ) தொடரும் தொடர்பும் அறிதல் - பிரித்து எழுதுதல் - பொருந்தாச் சொல்லைக் கண்டறிதல் – வழுவுச்சொற்களை நீக்கிய தொடரைக் குறிப்பிடுதல்- சொற்களை அகர வரிசைப்படுத்தல்- வேர்ச்சொல்லைத் தேர்வு செய்தல் - எவ்வகை வாக்கியம் எனக் கண்டு எழுதுதல் - சொற்களை ஒழுங்குபடுத்திச் சொற்றொடர் ஆக்குதல் - ஆங்கிலச்சொல்லுக்கு நிகரான தமிழ்ச் சொல் அறிதல்.

பாடநூல்:

1.சிறுகதைகள் பத்து – தொகுப்பாசிரியர். முனைவர். ஆ.ஜோசப்சார்லி - ஆ.தாஸ் நியு செஞ்சுரி புக் ஷவுஸ்(பி.லிட்). சென்னை – 98.

2.நாவல் - துணிந்தவன் - வல்லிக்கண்ணன்-பாவை பப்ளிகேஷன்ஸ். சென்னை -14.

3.இதலியல் கலை – டாக்டா.மா.பா.குருசாமி

4.தமிழ் இலக்கிய வரலாறு – **பாக்யமேரி**

பார்வை நூல்:

1. மக்கள் தகவல் தொடர்பியல் அறிமுகம் - டாக்டர் கி. இராசா.
2. இதழியல் - ச.ஈஸ்வரன்
3. இதழியல் - டாக்டர் இரா.கோதண்டபாணி
4. இதழியல் ஓர் அறிமுகம் - டாக்டர் அந்தோணி இராசு.
5. தமிழ் இலக்கிய வரலாறு – **எம்.ஆர்.அடைக்கலசாமி**

SEMESTER – II : PAPER – II
(For those who join in June 2015 and after)

PART – I Sanskrit Paper II		
Subject Title **: Poetry Grammar & History of Sanskrit Literature – II**		
Subject Code:**P1LS21**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

POETRY

Selected portions from the : KALIVIDAMBANAM &
SABHARANJANASATAKAM
Published by Sadguna Publications, Cidambaram

Kalividambanam

Unit I : Scholars and Teachers Verse No.1-10

Unit II : Astrologers & Physicians V.14-30

Unit III : Relatives & Pseudo monks Vv.41-50, 84-93.

Sabharanjanasatakam

Unit IV : Wisdom and it's acquisition Vv.1-12

Unit V : Donor and Donation and Values of Human Vv.31-42, 77-91.

LYRICS & CHAMPU KAVYAS –
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016 Page No. 51 – 60, 42 – 45)

SEMESTER – II
(For those who join in June 2015 onwards)

PART II – Paper I		
Subject Title **: Functional English**		
Subject Code:**P2LE21**	Hours per week: **5**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives: Total number of hours per semester: **75 Hrs**

- *To develop listening, speaking and reading skills*
- *To develop Information and Communication Technology (ICT) skills*
- *To develop presentation skills*
- *To develop competency in grammar*

Unit – I Listening, Speaking and Reading Components 15 Hrs

Prose

1. My Visions for India - A.P.J. Abdul Kalam
2. Mahatma Gandhi - V.S.Srinivasa Sastri
3. Computers and Common Sense - Roger Hunt & John Shelly
4. The Golden Age of Cricket - Neville Cardus
5. On Keyhole Morals - A.G. Gardiner

Unit – II Language Study 15 Hrs

- Tenses and Their Uses
- Concord or Agreement
- Conditional Sentences
- Active and Passive Voice
- Preposition

Book: ***A Textbook of English Grammar and Usage*** **by K.V.Joseph**
Second Edition (2012), TATA McGraw Hill Education Private Limited, New Delhi.

Unit – III Composition 15 Hrs

- Letter writing – Informal Letters
- Hints Development
- Descriptive Writing

Unit – IV Extensive Reading: Short Stories 15 Hrs

Extensive Reading

1. Upper Division Love - Manohar Malgonkar
2. The Tiger in the Tunnel - Ruskin Bond
3. A Devoted Son - Anitha Desai
4. *The Lost Child* - *Mulk Raj Anand*
5. Tree Speaks - C. Rajagopalachari

Unit – V Translation 15 Hrs

- Translation of Sentences and Stories from Tamil to English/English to Tamil (Passages will be supplied)

SEMESTER – II
(For those who join in June 2015 and After)

Part – III : Core Subject Theory		
Subject Title : Chordates-I		
Sub Code: 09CT21	**Hours per week: 4**	**Credit: 4**
Sessional Marks: 25	**Summative Marks: 75**	**Total Marks:100**

Objectives:

- *Acquire knowledge on general features, classification and evolution of chordates.*
- *Study of organs and organ systems to understand their functional aspects*

Unit I: Protochordata

General characters and classification with examples – Amphioxus - Detailed study, General characters of Balanoglossus and Ascidian. Affinities of Balanoglossus, Retrogressive Metamorphosis in Ascidian

UNIT II: Vertebrata

General characters and classification upto classes with examples Agnatha – salient features of Petromyzon External characters of Scoliodon, Mullet, Frog, Calotes, Pigeon and Rabbit

UNIT III:

Comparative anatomy in Vertebrates - Integumentary system, Digestive system and Respiratory system

UNIT IV

Comparative anatomy in Vertebrates - Circulatory system, Nervous system and Receptor organs

UNIT V

Endoskeleton (Frog only) and Endocrine glands

Comparative anatomy of Urinogenital system

Text Book

Ekambaranatha Ayyar, M. and Ananthakrishnan, T.N. 1995 – A Manual of Zoology Part II (Chordata) S. Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai.

References

- Gupta R.C and Girish Chopra, 2003 - Comparative Anatomy of Chordates – R.Chand& Co, New Delhi
- Jordan E.L, 2003 – Chordate zoology – S. Chand & Co, Chennai
- Kotpal, R.L. 2004 – Modern Text Book of Zoology Vertebrates, Second Edition, Rastogi Publications, Meerut.
- Harvey Pough F., Heifer, J.B. and McFarland, W.N. 1985 vertebrate life, Macmillan Pub. Co. New York.

SEMESTER – II

(For those who join in June 2015 and After)

Part – III : Core Subject Theory		
Subject Title : Chordates -II		
Sub Code: 09CT22	**Hours per week: 4**	**Credit: 4**
Sessional Marks: 25	**Summative Marks: 75**	**Total Marks:100**

Objectives

- *Basic understanding and the study of salient features*
- *Origin, organization, comparative anatomy and trace the evolution*

UNIT I

Origin and Phylogeny of Vertebrates, Amphibia, Reptilia and Birds

UNIT II

Parental care in fishes, Migration in fishes and Accessory respiratory organs in fishes

UNIT III

Parental care in Amphibia, Neoteny in Amphibia and Poisonous and non-poisonous snakes of South India

UNIT-IV

Flight adaptation and mechanism of flight in birds, Migration in birds and Flightless birds

UNIT V

Prototherians and Metatherians,Dentition in mammals, Aquatic mammals and Origin of mammals.

Text Book

- Jordan, E.L. and Verma, P.S. 2011. Chordate Zoology, S.Chand & Co Ltd

Reference books

- Kotpal, R.L. 2011. Vertebrates Rastogi Publications
- Gupta R.C and Girish Chopra, 2003 - Comparative Anatomy of Chordates – R.Chand & Co, New Delhi

- Newmann, 1981, The Phylum chordata, Biology of vertebrates and their kin, Satish Book Enterprises, Agra.

SEMESTER – II
(For those who join in June 2015 and After)

Part – III : Core Subject Practical -I		
Subject Title : Invertebrates & Chordates		
Sub Code: 09CP23	**Hours per week: 2**	**Credit: 1**
Sessional Marks: 40	**Summative Marks: 60**	**Total Marks:100**

Semester– I
Invertebrates

Objectives

- Visualize and assimilate morphological and anatomical features by dissection demonstration, preserved specimens, charts and models
- Field trip to observe animals at their habitat & understand their biodiversity
- Agricultural field visit to identify pests of economical importance
- Vermifarm and apiary visit to envisage entrepreneurial potentials

A. Demonstration

Cockroach- Dissection - Digestive system, Nervous systems & Reproductive system
Mounting -Mouth parts and Salivary glands
Earthworm-Dissection - Digestive and Nervous systems
Mounting - Body setae and Penial setae
House fly- Mounting -Mouthparts

B. Chart/Models

Pila - Digestive system and Nervous system
Freshwater mussel - Digestive system

C. Spotters

Protozoa *Amoeba*, *Plasmodium*, *Paramecium* Entire and conjugation.
Porifera Gemmules and Spicules.
Coelenterata *Obelia* Colony, Medusa, *Physalia*, Any One Coral, Sea Anemone.
Helminthes Liverfluke-Entire, *Taenia*(Entire and Scolex).
Nematoda *Ascaris* Male and Female.

Annelida	*Nereis*, Leech .
Arthropoda	*Zoea, Nauplius*, Millipede and Centipede
Mollusca	*Chiton*, Sepia, *Nautilus*, Octopus.
Echinodermata	Starfish, Sea urchin , Sea cucumber.

D. Field Visit Observation and identification of insect pests of agricultural crops.
Vist to Vermifarm and observación of Earthworm species
Visit to Apiary

SEMESTER – II
Chordates

Objectives

- Visualize and assimilate morphological and anatomical features by dissection demonstration, preserved specimens, charts and models
- Field trip to observe animals at their habitat & understand their biodiversity

A. Dissection and mounting

Fish – Dissection and observation of visceral organs
Shark- Mounting of Placoid Scales

B. Chart/Models

Frog - Arterial system and Venous system, brain and spinal nerves

C. Spotters

Amphioxus,Balanoglossus, Ascidian, Petromyzon

Narcine, Anabas, Echines, Hippocampus, Eel

Rhacophorus and *Alytes*

Krait, Cobra, Viper, *Typhlops, Enhydrina, Draco* and Chaemeleon

Beaks and feet in birds, Ant eater and Bat

Osteology of Rabbit – Skull, Typical Vertebra, Pectoral and pelvic girdle – Fore limb and Hind limb

D. Field visit

Rameshwaram, Kurusadai Island & Mandapam - Biodiversity study of marine animals.

SEMESTER – II

(For those who join in June 2015 and after)

PART III – Allied Course Theory – II		
Subject Title **: Inorganic, Organic and Physical Chemistry – I**		
Subject Code:07AT02	Hours per week: 4	Credit: 4
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

To enable the students

- *To learn the basic Principles Of Titrimetry*
- *To gain basic knowledge about pesticides*
- *To have gain the basic concept of amino acids*
- *To be basic concept of chemical bonding*
- *To know about the pollution and the effect.*

UNIT I: ACIDS AND BASES 12 Hrs

Definition of acids and bases- Arrhenius concept -Lowry-Bronsted and Lewis concept – Cady – Elsey concept – Lux Flood concept – Usinovich concept of acids and bases- P^H concept.

UNITII: PESTIDCIDES, ANDFUNGICIDES 12 Hrs

Pesticides: Definition – Classification – Organic and inorganic pesticides – Mechanism of action – Characteristics – Safe handling of pesticides – Impact of pesticides on soil, plants and environment –Fungicides: Definition – classification – mechanism of action – sulfur, copper, mercury compounds.

UNITIII: AMINOACIDS, PROTEINS AND VITAMINS 12 Hrs

1. Classification – (Gabriel Phthalimide synthesis) – properties of amino acids – polypeptides – proteins – classification.
2. Vitamins Classification and biological functions of vitamins A, B_6, B_{12}, C, D, E and K(Structural elucidation not required).

UNIT IV: CHEMICAL BONDING 12 Hrs

Ionic Bond – Lattice Energy – Born-Haber Cycle – Properties of Ionic Compounds - Covalent bond – polar covalent bond – characteristics of covalent bond – hydrogen bond – Metallic bond – Fajan's Rule.

UNIT V: POLLUTIONS 12 Hrs

Air pollution: Definition – Composition of air – Chemical reactions occurring in air due to sunlight– Sources of air pollution – Classification and effects of air pollutants – Effects of CFC – Ozone layer- Green house effect.

Water pollution: Types – sources –water – sewage – industrial effluents – inorganic pollutants- water pollution control – water treatment.

TEXT BOOK:

Ancillary chemistry K.Ratinamuthu (Study material will be provided)

REFFERENCE

1.Advanced Organic Chemistry by Bahl & Arun Bahl, S.Chand & Company Ltd, NewDelhi, 2012 Edition.

2.Text book of Inorganic Chemistry by P.L.Soni, Mohan Katyal,Sultan Chand & Sons, NewDelhi, 2010 Edition.

3. Essentials of Physical chemistry Arun Bahl, B.S.Bhal & G.D.Tuli, S.Chand Publishing Company, New Delhi, 2010 Edition.

SEMESTER – II

(For those who join in June 2015 and after)

Part – IV : Non-Major Elective		
Subject Title : **FOOD AND NUTRITION**		
Subject Code: **09NE21**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

2hrs/week- 30 hrs

Objectives

- *Reveal the types, source and importance of nutrients*
- *Expose disorders of malnutrition and food born diseases*
- *Inculcate importance of sanitation and hygiene for societal welfare*

Unit-I Food as a source of nutrients

Definition- functions of food- recommended daily allowances for nutrients- nutritive value of foods- Balanced diet.

Unit-II Nutrients

Carbohydrates, Proteins Fats, Minerals and Vitamins.

Unit-III Disorders of Malnutrition

Kwashiorkor – Marasmus – Obesity – Anaemia -Epidemic dropsy and Deficiency diseases.

Unit-IV Food sanitation and Hygiene

Water- Food- food spoilage- Preservation- Control of Insects and Rodents

Unit-V Food Borne Diseases

Food poisoning-Poisoning organisms – Bacteria, Mold and Yeast.

Text book

Fundamentals of Foods and Nutrition – R. Mudambi and V.Rajagopal – Wiley Eastern Limited – New Delhi.

மூன்றாம் பருவம் - பாடத்திட்டம்
(2015-2016ஆம் கல்வியாண்டு இரண்டாம் முதற்பருவத்தில் சேரும் மாணவர்களுக்குரிய பாடத்திட்டம்)

PART-I: Language Tamil Subject		
Subject Title: **காப்பியமும் பக்தி இலக்கியமும் நாடகமும் - தாள்:3**		
Subject Code: **P1LT31**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative marks: **75**	Total Marks: **100**

அலகு: 1 தமிழ்க் காப்பிய இலக்கியம்

1.சிலப்பதிகாரம் - வழக்குரை காதை
2.மணிமேகலை – ஆபுத்திறன் திறம் அறிவித்த காதை
3.கம்பராமாயணம் - வாலி வதைப்படலம்
4.வில்லிப்புத்தூரர் பாரதம் - கண்ணன் தூதுச்சருக்கம்
5.கந்த பராணம் - அயனைச் சிறை நீக்கும் படலம்

அலகு: 2 தமிழ் பக்தி இலக்கியம்

1. இயேசு காவியம் - மலைப்பொலிவு – கண்ணதாசன்
2. பராபரக்கண்ணி – தாயுமானவர் - 10 பாடல்கள்
3. திருப்பாவை – ஆண்டாள் - 10 பாடல்கள்
4. தேவாரம் - திருஞானசம்பந்தர் (திருவேடகப் பதிகம்)
5. திருவாசகம் - மாணிக்கவாசகர் - பிடித்த பத்து
6. திருமந்திரம் - திருமூலர் - 10 பாடல்கள்

அலகு: 3 நாடகம்

வைகையில் வெள்ளம் வரும் - சேதுபதி

அலகு: 4 தமிழ் இலக்கணம்

1. அணிகள் - உவமை – உருவகம் - பிறிது மொழிதல் - தற்குறிப்பேற்றம் வஞ்சப்புகழ்ச்சி – சிலேடை – வேற்றுமை அணி
2. பா வகைகள் - நான்கு வகைப்பாக்கள்
3. வேற்றுமைகள்
4. கடிதம் வரைதல் - விண்ணப்பம் - புகார்க் கடிதம் - பாரட்டுக்கடிதம்

அலகு: 5தமிழ் இலக்கிய வரலாறும் படைப்பாற்றலும்

அ) 1. காப்பிய இலக்கிய வரலாறு
2. பக்தி இலக்கிய வரலாறு

ஆ) பத்திரிக்கைச் செய்தி எழுதுதல் - நேர்காணல் எழுதுதல் - துணுக்கள் எழுதுதல்

பாடநூல் :

1. தமிழ்ச் செய்யுட் தொகுப்பு – தமிழ்த்துறை வெளியீடு
2. நாடகம் - வைகையில் வெள்ளம் வரும் - சேதுபதி. பாவைபப்ளிகேஷன்ஸ்

பார்வை நூல்:

தமிழ் இலக்கிய வரலாறு – **பாக்யமேரி**

தமிழ் இலக்கிய வரலாறு – **எம்.ஆர்.அடைக்கலசாமி**

SEMESTER – III : PAPER – III
(For those who join in June 2015 and After)

PART – I Sanskrit Paper III		
Subject Title **: Prose ,Poetics & History of Sanskrit Literature – III**		
Subject Code: **P1LS31**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

PROSE

Following portions from the prescribed text: 'SAHITYA RASA KANA'

- Published by J.M. Publications, Madurai.

1. GURU BHAKTHI
2. MATANGA CHARITAM
3. SAMSARGAJAH DOSHAGUNAAH BHAVANTHI
4. AKARNA HRIDAYO GARDABAH
5. VASUDEVA DAUTHYAM

POETICS

ALAMKARAM (POETICS) FROM THE TEXT BOOK: SAHITYA

RASAKANA:-

UPAMA, ANANVAYA, UTPREKSHA, ATHISAYOKTHI, ULLEKHA,

VYATHIREKA, SAMASOKTHI, SLESHA, ARTHANITHARANYASA.

HISTORY OF LITERATURE

Prose Romance,

Historical Kavyas, Popular Tales.

A short history of Sanskrit Literature

(Published by A.M.G. Publications, Madurai – 625 016

Page No. 35 – 40, 40 – 44, 45 - 50)

SEMESTER – III
(For those who join in June 2015 onwards)

PART II – Paper I		
Subject Title **:**	**English through Drama and Poetry**	
Subject Code:**P2LE31**	Hours per week: **4**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

OBJECTIVES: **Total number of hours per semester: 60 hours**

- *To make students read and appreciate English Plays*
- *To make students appreciate English poetry*
- *To motivate students to face Competitive Examinations*
- *To develop continuous writing in English*
- *To make students read extensively*

Unit I – One Act Plays 15 Hrs

1. The First and the Last - John Galsworthy
2. Remember Caesar - G.Devoit
3. The Sheriff's Kitchen - Ronald Gow
4. The Boatswain's Mate - W.W.Jacobs and H.C. Sargent
5. The Pathfinder - Hermon Ould

Unit II – Poems 15 Hrs

1. Githanjali (Poem 50) - Rabindranath Tagore
2. The Earthen Goblet - Harinranath Chattopadhyaya
3. La Belle Dame Mercy - John Keats
4. Fidelity - William Wordsworth
5. Quality of Mercy - William Shakespeare
6. The Tiger and the Deer– Sri Aurobindo

Unit - III Objective English 10 Hrs

- Comprehension

- Spotting the Errors
- Sentence rearrangement
- Sentence Fillers
- Cloze test or Numbered Gaps

Text Book: *Objective English for Competitive Examinations* – Hari Mohan Prasad, Uma Rani Sinha, Tata McGraw Hill Education Private Limited, New Delhi. 2010, Fourth Edition

Unit – IV Composition 10 Hrs

- Dialogue Writing
- Paragraph Writing

Unit – V Extensive Reading 10 Hrs

Hayavadana – Girish Karnad, Oxford University Press

SEMESTER – III

(For those who join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Cell Biology**		
Subject Code: **09CT31**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Basic idea about animal cell, composition, organelles and their functions*
- *Introduction of microscopy and cytological methods*
- *Origin and properties of cancer cells*
- *Chemistry and functions of nucleic acids*

Unit – I 12 Hours

Microscopy: Principles of light and electron microscope. Cell as the basic unit of living organism – Cell theory – isolation of cellular components – Homogenisation – fractionation – Centrifugation – Fundamentals of fixation – Staining methods

Unit- II 12 Hours

Plasma Membrane: Ultra structure – Chemical composition and functions, Endoplasmic reticulum: Structure, types and functions Golgi complex: Structure, Composition and functions Lysosome: Structure, forms, functions and origin.

Unit- III 12 Hours

Mitochondria: Structure, Chemical composition – Functions – Kreb's cycle – Oxidative phosphorylation, Ribosome: Structure – Chemical composition – Functions and origin.

Unit- IV 12 Hours

Nucleus & Nucleolus: Structure and functions, Chromosome: Structure Giant Chromosomes Cell Cycle: Cell division – Mitosis & Meiosis - Cancer Cells – Cell aging.

Unit- V 12 Hours

Nucleic Acids: Molecular Structure of DNA & RNA – Types of RNA & DNA replication, Role of RNA and ribosome in protein synthesis, Regulation of protein synthesis (Lac Operon).

Text book

Cytology, Verma P.S. & Agarwal V.K. (2008) .S.Chand & Co. New Delhi

Reference Books

1. Cell and Molecular Biology, (2001) De Robertis E.D.P. & De Robertis E.M.F. CELLS- Principles of Molecular Structure and Functions- David M.Prescott (1988) Jones and Bartlett Publications
2. Cell Biology – Gerald Karp (1985) McGraw Hill Book Co.

SEMESTER – III
(For those who join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Genetics**		
Subject Code: **09CT32**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Mendelian concepts, application and modes of inheritance*
- *Interaction of genes and molecular events for chromosomal mapping*
- *Sex determination and role of environmental factors in inheritance*
- *Human genetics, pedigree analysis and counselling for communal welfare*

UNIT-I 15 hrs

Principles of Inheritance- Interaction of genes (Factor hypothesis)

a) Historical ideas- Mendel's work- Mendel's laws of inheritance- Mendelian ratio- Test cross- Back cross- Pleiotropism- Penetrance and expressivity.

b) Non-allelic interactions- Complementary genes, Epistasis, Supplementary genes, duplicate genes, Collaborator genes and Lethal genes.

UNIT- II 15 hrs

Polygenic inheritance and Multiple allelism

a) Definition- Mode of inheritance of Kernel colour in Wheat and Skin colour in Man- Difference between Polygenic and Mendelian inheritance; Multple allele

b) Definition- Mode of inheritance of Coat colour in Rabbit and ABO-blood groups in Man- Problems relating to inheritance of ABO- blood groups - Genetics of M-N blood group and Problems.

c) Genetic basis of Rh- Blood groups and their significance

UNIT-III 15 hrs

Linkage and Crossing-over

a) Definition- Linkage- Linkage groups- Kinds of Linkage- Detection of linkage- Significance.
b) Crossing- over- Significance and evidences of Crossing-over.
c) Chromosomal Mapping.

UNIT- IV 15 hrs

Sex determination and sex linkage

a) Mechanism of Sex determination- various theories- Role of hormone and environment in sex determination.
b) Sex linked inheritance in Man- Colour blindness, Haemophilia and Eye colour in Drosophila- inheritance of sex limited and sex influenced genes- holandric genes.

UNIT-V 15 hrs

Extra chromosomal inheritance

a) Inheritance of Shell coiling in Snail, Kappa particles in Paramecium and Sigma particles in Drosophila.
b) Inborn errors of Metabolism.
c) Human genetics
   (i) Role of Pedigree analysis (ii) Twin study (iii) Syndromes
   (iv) Genetic counselling (v) Eugenics, euthenics and euphenics.
d) Inbreeding- outbreeding- heterosis.

TEXT BOOK

Genetics – Verma P.S. & VK Agarwal (2013) S. Chand & Co, New Delhi.

REFERENCE BOOKS

1. Principles of Genetics- Sinnott, Dunn and Dobzhansky(1958),Mc.GrawHill Pub. Co.
2. Principles of Genetics- E.J. Gardner et al (1991),Wiley Eastern & Co
3. Human Genetics- E.A. Carlson, (1985) Mc.Graw Hill Pub. Co.
4. Genetics – S. Sambamurthy (2005) Narosa Publications, New Delhi.
5. Concepts of genetics, Williams S. Klug and Michael R. Cummings (2007) Dorling Kindersley (India) Pvt. Ltd.

SEMESTER – III
(For those who join in June 2015 and after)

PART – III : Allied Subject Theory		
Subject Title: **Plant Diversity**		
Subject Code: **08AT01**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *To understand the life history of cryptogams*
- *To understand the evolution of plants*
- *To learn to identify the different groups studied*

UNIT I: **ALGAE**

General characters – Structure and reproduction of the following.

a) Cyanophyceae - *Nostoc*

b) Chlorophyceae – *Oedogonium*

c) Phaeophyceae – *Sargassum*

UNIT II: **FUNGI**

General characters – Structure and reproduction of the following.

a) Ascomycetes – *Penicillium*

b) Basidiomycetes – *Puccinia*

c) Lichens – Nature of association – habit and habitat - classification and morphology of lichen thallus. (Reproduction need not be discussed)

UNIT III: BRYOPHYTES

General characters – structure and life cycle of *Funaria.*

UNIT IV: **PTERIODOPHYTES**

General characters – structure and life cycle of *Lycopodium*.

UNIT V: **GYMNOSPERMS**

General characters – structure and life cycle of *Cycas.*

Text Books:

1. An introduction to Embryophyta –Pteridophytes - N.S. Parihar, Surjeet Publications, Delhi, 2012 Ed.
2. Introduction to Mycology - C.J.Alexopoulos, Willey Eastern Pvt. Ltd, 2013 Ed.
3. Botany for Degree Students Gymnosperms - P.C. Vashishta, S.Chand & Company Ltd, Delhi, 2014 Ed.

Reference Books:

1. Morphology of Gymnosperms – Coulter, M. Jhon, Surjeet Publications, Delhi, 2014 Ed.
2. Botany for Degree Students Algae – P.C. Vashishta, S.Chand & Company Ltd, Delhi, 2014 Ed.
3. An introduction to Embryophyta –Bryophytes - N.S. Parihar, Surjeet Publications, Delhi, 2013 Ed.

SEMESTER – III
(For those who join in June 2015 and after)

Part – IV : Skill Based Subject		
Subject Title : **Public Health and Hygiene**		
Subject Code: **09SB31**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- *Inculcate the importance of public health and hygiene*
- *Consciousness on importance, source and quality of water*
- *Awareness on certain important human diseases and their preventive measures*
- *Focus on health planning and health programme*

UNIT I:

Scope of Public Health and Hygiene – Concepts of Health and Disease –. Nutrition and Health: Classification of foods – Nutritional deficiencies – Vitamin deficiencies – Balanced diet – Nutritional requirements of special groups.

UNIT II:

Environment and Health: Water-sources,– Water quality standards.– Solid waste and excreta disposal – Sewage treatment.

UNIT III:

Communicable diseases: 1. Respiratory infections: Measles, Rubela, Mumps, Diptheria 2. Intestinal infections: Poliomyletis, Cholera, Typhoid, Amoebiasis 3. Arthropod infections: Malaria, Filariasis, Dengue 4. Zoonosis: Rabies, Plague, Japanese encephalitis 5. Surface infections: Tetanus, Leprosy, STD and AIDS.

UNIT IV:

Non-Communicable Diseases: Coronary Heart Disease – Hypertension – Diabetes – Obesity – Blindness – Stroke. Occupational Health Hazards: Physical, Chemical, Mechanical, Biological and Psychological. Mental health: Causes of mental ill-health-alcoholism and Drug dependence.

UNIT V:

Health Education: Health planning in India – Health programmes in India – WHO – Non-governmental Voluntary Health Organizations. First aid and Nursing: Methods – Dressing – care — Preparations.

Text books:

- Park and Park, 1995. Text Book of Preventive and Social Medicine.
- M/s. Banarsidas Bhanot Publishers, Jabalpur.
- Verma S. 1998. Medical Zoology, Rastogi Publications, New Delhi.

Reference Book:

- C. Gopalan, 1985, Nutritive values of Indian foods, ICMR, New Delhi
- Rajvir Bhawar, 2008. Text Book of Public Health and Community Medicines, Published by Armed Forces Medical College, Pune.

நான்காம் பருவம் - பாடத்திட்டம்

(2015-2016ஆம் கல்வியாண்டு முதல் இரண்டாம் முதற்பருவத்தில் சேரும் மாணவர்களுக்குரிய பாடத்திட்டம்)

PART-I: Language Tamil Subject		
Subject Title: **சங்க இலக்கியமும் நீதி இலக்கியமும் - தாள்:4**		
Subject Code: **P1LT41**	Hours per week: **6**	Credit: **3**
Sessional Marks: **25**	Summative marks: **75**	Total Marks: **100**

அலகு: 1 தமிழ்ச் சங்க இலக்கியம்- பத்துப்பாட்டு

1. பத்துப்பாட்டு – முல்லைப்பாட்டு தமிழ்ச் செய்யுள் தொகுப்பு –தமிழ்த் துறை வெளியீடு

அலகு: 2 தமிழ்ச் சங்க இலக்கியம் - எட்டுத்தொகை

1. நற்றிணை
2. குறுந்தொகை
3. கலித்தொகை
4. அகநானூறு
5. புறநானூறு
6. பரிபாடல்

அலகு: 3 தமிழ் நீதி இலக்கியம்

1. திருக்குறள் : செய்நன்றியறிதல் - அதிகாரம் -11
   காலமறிதல் - அதிகாரம் - 49
   குறிப்பறிதல் - அதிகாரம் 71
2. பழமொழி நானூறு – கல்வி அதிகாரம்
3. நாலடியார் - கல்வி அதிகாரம்

அலகு: 4 தமிழ் இலக்கணம் - பொருள்

1. அகப்பொருள் - அகத்திணைகள்
2. புறப்பொருள் -புறத்திணைகள்
3. உள்ளுறை இறைச்சி

அலகு: 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்

அ) 1. சங்க இலக்கிய வரலாறு

2. நீதி இலக்கிய வரலாறு

ஆ) புத்தகமதிப்பரை –தமிழ்த் திரைப்பட விமர்சனம்.

பாட நூல்:

1. தமிழ்ச் செய்யுள் தொகுப்பு –தமிழ்த் துறை வெளியீடு
2. தமிழ்ச் செய்யுள் தொகுப்பு – தமிழ்த்துறை வெளியீடு

பார்வை நூல்:

தமிழ் இலக்கிய வரலாறு – **பாக்யமேரி**

தமிழ் இலக்கிய வரலாறு – **எம்.ஆர்.அடைக்கலசாமி**

SEMESTER – IV: PAPER – IV
(For those who join in June 2015 and after)

PART - I Sanskrit Paper IV		
Subject Title **: Drama And History of Sanskrit Literature – IV**		
Subject Code: **P1LS41**	Hours per week: **4**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

60 hours to Drama, 30 hours to Spoken Sanskrit.

DRAMA

Following portions from the prescribed text: 'SAHITYA RASA KANA'

- Published by J.M. Publications, Madurai.

Unit I, II, III

1. Karnabharam of Bhasa

Unit IV

History of Drama Literature

A short history of Sanskrit Literature

(Published by A.M.G. Publications, Madurai – 625 016 Page No. 59 – 75)

Unit V

30 HOURS OF ORAL TRAINING DEVELOPING THE COMMUNICATION SKILLS THROUGH THE SANSKRIT LANGUAGE.

SEMESTER – IV
(For those who join in June 2015 onwards)

PART II – Paper I		
Subject Title **: English through Classics**		
Subject Code:**P2LE41**	Hours per week: **4**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

OBJECTIVES: **Total number of hours per semester: 60 hours**

- To motivate students to read and understand English prose
- To make students appreciate English poetry
- To enable students to face Competitive Examinations in English
- To develop continuous writing of the students
- To make students read extensively.

Unit I - Prose

1. Building Self Confidence (Personality - by Norman Vincent Peale Development) From, English for Enrichment, Edited by Prof. K. Chellappan.
2. Sport- A Modern Hunting Ritual - by Desmond Morris (Essay), From, English for Enrichment, Edited by Prof. K. Chellappan.
3. The Soft Thunder of Lumbini - by Hugh and Colleen, (A travelogue Feature in a Newspaper) From, English for Enrichment, Edited by Prof. K. Chellappan.
4. She is Dancing Back in Life - by Oeborach Cowley (A True Life Story)

From, English for Enrichment, Edited by Prof. K. Chellappan.

5. Within Without - Rabindranath Tagore.

Unit II – Poems

1. Kali the Mother	Swami Vivekananda
2. Lochinvar	Walter Scott
3. Yossouf	James Russell Lowell
4. The Daffodils	William Wordsworth
5. Much Madness	Emily Dickinson
6. The Woman Who is ……(XCII)	Kabir Das
7. Stopping by Woods on a Snowy Evening	Robert Frost

Unit III - Objective English

- Sentence Completion
- Synonyms
- Antonyms
- Idioms and Phrases
- Substitution

Text Book: *Objective English for Competitive Examinations* – Hari Mohan Prasad, Uma Rani SInha, Tata McGraw Hill Education Private Limited, New Delhi. 2010, Fourth Edition

Unit IV - Composition

- Descriptive writing - Topics on Personal Experience
- Resume Preparation
- SMS and E-Mail Preparation and sending.

Unit V Extensive Reading: Four Scenes from Shakespeare's plays.

1. **The Merchant of Venice.** Act IV – Scene I – Portia's Speech.
2. **Julius Caesar.** Act III – Scene II – Mark Antony and Brutus Speech.
3. **Twelfth Night.** Act V – Scene I – Before Olivia's House.
4. **Othello.** Act V – Scene II – A Bedchamber in the Castle.

SEMESTER – IV
(For those who join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Developmental Biology**		
Subject Code: **09CT41**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives:

- *Introduce basic aspects animal and human development*
- *Understand certain important process involved in embryonic development*

Unit-I

a) Historical reviews-Theory of pre formation, Theory of Epigenesis, Baer's law and Biogenetic law

b) Gametogenesis- spermatogenesis, Oogenesis

c) Types of eggs -structure of spermatozoa and ovum in mammals.

Unit-II

a) Fertilization: Acrosomal reaction, cortical reaction, Physiological and biochemical changes, significance-parthenogenesis.

b) Planes and types of cleavage patterns.

c) Fate maps in Amphioxus, Frog and Chick.

Unit-III

a) Blastulation and Gastrulation in Amphioxus, Frog and Chick.

b) Organogenesis: Derivatives of Ecto, Meso and Endoderm-Development of Brain, Eye, Heart and Kidney.

c) Foetal membranes in Chick

Unit-IV

a) Human reproduction; Menstrual cycle-Menopause, pregnancy-Parturition-lactation-hormonal control -Types and Functions of Placenta.

b) Amphibian metamorphosis: Anatomical and Biochemical changes, role of

hormones in metamorphosis, Insect metamorphosis.

c) Regeneration: Definition –mechanism and types- factors controlling regeneration

Unit-V

a) Gradient theory- Organizer- Concept, Spemann's experiment, Mechanism of Induction- Nuclear transplantation experiments.

b**)** Differentiation- Types, processes, competence- Nucleo cytoplasmic interaction

c) Human welfare and Embryology- Birth control, Infertility, Test tube Baby and Teratogenesis.

TEXTBOOK

- Verma, S and Agarwal, V.K, 2005, Chordate Embryology, S. Chand & Co, New Delhi.

REFERENCE BOOKS

- Balinsky, B.I, 1981, An Introduction to Embryology, Holt Saunders, New York.
- Berrill, N.J, 1986, Developmental Biology, McGraw Hill, New Delhi.

SEMESTER – IV

(For those who join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Physiology**		
Subject Code: **09CT42**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Per unit 15 hrs / week

Objectives

- *Organization of various organ system and their functioning mechanisms*
- *Study of animal behaviour and introduction of Biological clocks*

UNIT- I

a) Definition and brief history of Physiology - the fields and branches of physiology.Nutrition and types - Food- composition, classification - the physiologicalrole of major nutrient and minerals;Vitamins-chemical nature of vitamins, classification and their role in animal life.

b) Digestion and absorption of carbohydrate, protein and lipids in man.

UNIT- II

a) Circulation- types of circulatory system, circulatory media found in animals, types of heart, origin and conduction of heart beat, composition of blood, general functions of blood, blood clotting mechanisms, blood transfusion, blood volume and blood pressure.

b) Respiration –- Respiratory pigments, transport of respiratory gases-Oxygen dissociation curve, respiratory quotient.

UNIT- III

a) Excretion- major excretory substances- classification of animals based on excretory products, excretion and water conservation, structure of human kidney, nephron and its ultra structure, mechanism of urine formation and excretion – hormonal control.

b) Osmoregulation–definition,Osmoregulators,osmoconformers,stenohaline and euryhaline organisms, Osmoregulation in fishes and crustaceans - Thermoregulation–Suspendedanimation–Hibernation,Aestivation, Diapause.

UNIT- IV

a) Nervous system- Central Nervous system and Autonomous Nervous system physiological role of sympathetic and para-sympathetic Nervous system- Ultra structure of a typical neuron, concept of synapse- nerve impulse conduction- neuro muscular junction- reflex action- reflex arc.

b) Muscular system-ultrastructure of skeletal fibres-general properties of muscle fibre during muscle contraction.

UNIT- V

a) Receptors- different types of receptors- structure and functioning of phonoreceptor (Human ear) and photoreceptor (Human eye)

b) Endocrine system- structure, hormones and role of pituitary gland, thyroid gland, Para-thyroid gland, adrenal gland and Islets of Langerhans. Chronobiology-biological rhythms, and biological clock.

TEXT BOOKS

- Essentials of Animal Physiology – S.C Rastogi ,2002, Wiley Easernt Ltd. New Delhi.
- Animal physiology- A.Mariakuttikan & N. Arumugam 2006,Saras Pub,Nagercoil.

REFERENCE BOOKS

- General & comparative Animal physiology – William S. Hoar 2004. Prentice-Hall
- Animal physiology - Kunt Schmidt, 2000-Eastern Economy Ed.
- Comparative Animal physiology - C.L Prosser and F.A.Brown 1965,W.B.Saunder’s Co
- Animal physiology and related Biochemistry – R.C. Dalela Verma,1995, Jai Prakash Nath and Co.

SEMESTER – IV
(For those who join in June 2015 and after)

Part III : Core Subject Practical II Subject Title : **Cell Biology, Genetics, Developmental biology & Physiology**		
Subject Code: **09CP43**	Hours per week: **2**	Credit: **4**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

Semester –III
Cell Biology & Genetics

Cell biology

Objectives

- Observation of different cell types
- Histological techniques for the preparation of permanent slides

1. Study of Cell types – Observation of prepared slides
2. Study of oral epithelium in human and Onion peeling
3. Mitosis – Study of stages in Onion root tip meristem
4. Meiosis – Study of stages of spermatogenesis in grass hopper testis –squash
5. Micro technique- Preparation of permanent slides (Demonstration only).
6. Identification of the genetic material(chromosome)by simple staining – Giant chromosome in Chironomous larva
7. Spotters- Watson and Crick model of DNA, DNA Replication, Lac Operon, Clover leaf model of RNA and Coding dictionary

Genetics

Objectives

- Verification of Mendelian principles using colour beads
  1. A survey of simple Mendelian traits in man (Class population)
  2. Use of beads and models to illustrate Monohybrid , Dihybrid and Test cross
  3. Distribution of tasters and non tasters in the class population (PTC tasting)
  4. Polygenic inheritance of quantitative traits – observations and graphical representations may be made using height and weight of the students.
  5. Genetic basis and significance of Gynandromorphism, Shell coiling in Limnaea, Klinefelters, Down and Turner's Syndromes and Colour blindness and Hypertrichosis.
  6. Fraternal, Identical and Siamese twins
  7. Drosophila culture and identification of various stages.

SEMESTER –IV
Developmental Biology & Physiology

Developmental Biology

Objectives

- Observation of embryonic and developmental stages of animals
- Train the students to mount embryonic stages
- Study the role of hormones in developmental biology

1. Study of structure of egg of an insect, frog and Chick.
2. Temporary mounting of Chick blastoderm.
3. Effect of Thyroxin in tadpoles of Frog (Group study)
4. **Spotters** a) Observation of Cleavage, Blastula and Gastrula of Frog (Slides), Whole mount of 24 hours and 48 hours chick embryo (Slides)
5. Placental types – Observation

Physiology

Objectives

- Observe the physiological activities of animals
- Test the products of physiological activities of animals

1. Effect of temperature on the opercular movement of fish.
2. Study of oxygen consumption by a fish
3. Test for the detection of excretory products (Ammonia, Urea and Uric acid).
4. Study of blood corpuscles- Preparation of blood smear and counting of blood corpuscles using haemocytometer.

5. A study on ECG strip and report
6. Effect of activities on blood pressure in Man.

SEMESTER – IV
(For those who join in June 2015 and after)

PART – III : Allied Subject Theory		
Subject Title: **TAXONOMY OF ANGIOSPERMS & PLANT PHYSIOLOGY**		
Subject Code: **08AT02**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *To understand the life history of angiosperms*
- *To understand the mechanism of water movement in plants*
- *To know the various kinds of hormones involved in plants growth*

UNIT I:

Natural classification – Benthem and Hooker's classification.

UNIT II: Studying the following families:

Annonaceae, Caesalpiniaceae, Asclepiadaceae, Lamiaceae, Euphurbiaceae, Poaceae.

UNIT III: Plants and water relations

Osmosis – water potential concept – Plasmolysis – Mechanism of Absorption of water and transpiration Guttation.

UNIT IV: Photosynthesis

Structure of chloroplast – Light reaction – Dark reaction – C_3 and C_4 cycles only.

UNIT V: Growth and development

a) Growth hormones – Auxins, Gibberellins and cytokinins.
b) Physiology of flowering – Photoperiodism and Vernalization.

Text Books:

1. Taxonomy of Angiosperms- B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. Plant Physiology – Ray Noggle .G, MJP Publishers, Chennai, 2010 Ed.
3. Plant Taxonomy – OP. Sharma, McGraw Hill Education, India, Delhi 2010 Ed.

Reference Books:

1. Plant Physiology – Suraj Mandal, Campus Books, New Delhi, 2014 Ed.
2. Practical Taxonomy of Angiosperms – R.K. Singha, Inter. Publishing House, Delhi, 2013 Ed.
3. Plant Physiology - Jain, V.K, S.Chand & Company Ltd, Delhi, 2013 Ed.

SEMESTER – IV

(For those who join in June 2015 and after)

PART – III : Allied Subject Practical		
Subject Title: **Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms, Taxonomy And Plant Physiology**		
Subject Code:**08CP03**	Hours per week: **2**	Credit: **2**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

1. Make suitable micropreparations of types prescribed in Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperm.
2. Identifying, observing and sketching the floral parts of the plants belonging to the families prescribed in the syllabus.
3. Demonstrating the following physiology experiments
    1. Four leaf experiment
    2. Foliar Transpiration
    3. Ganong's Light screen
    4. Ganong's Potometer
    5. Mohl's half leaf experiment
    6. Evolution of O_2 during photosynthesis
    7. Arc Auxanometer
    8. Clinostat
    9. Phototropism
    10. Kuhne's fermentation vessel

SEMESTER – IV
(For those who join in June 2015 and after)

Part – IV : Skill Based Subject		
Subject Title : **Clinical Lab Technology**		
Subject Code: **09SB41**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Principles, applications and working mechanisms of biomedical instruments*
- *Importance of blood grouping*
- *Functions of ECG and EEG*
- *Examination of semen and stools*

UNIT I BIOMEDICAL DIAGNOSTIC LABORATORY-1:

Laboratory bio safety – general plan and organization –biomedical waste management, Applications of autoclave, centrifuge, microscope.

UNIT II BIOMEDICAL DIAGNOSTIC LABORATORY -2

Electrophoresis, Chromatography, Colorimeter, Ultra Sound scan, X-ray, Doppler scan, CT scan, MRI scan.

UNIT III HEMATOLOGICAL TECHNIQUES 1:

Blood – composition - counting of blood cells – blood smear – staining- ABO and Rh Blood grouping – Transfusion strategies.–

UNIT IV HEMATOLOGICAL TECHNIQUES 2

Haemoglobin estimation - Haemoglobinometer, Haemocytometer, ECG, EEG – ESR — Blood bank.

UNIT V BIOMEDICAL STANDARDS AND DISORDERS:

Lipid profile, enzyme profile, urine profile, semen analysis, stool examination; anaemia, diabetes, jaundice, bleeding disorders, CHD, Arthritis.

Text Book

- Medical Laboratory Technology - Volume I, II & III –L. Mukherjee, 1989 – McGraw Hill Publ. Co.

SEMESTER – V
(For those who join in June 2015 and After)

PART II – Paper I		
Subject Title **: English for Career Development**		
Subject Code:**P2LE51 / P2CE51**	Hours per week: 1	Credit: 1
Sessional Marks: **100**		Total Marks: **100**

Total number of hours: 15 hours

Objectives:

- *To make students face Competitive Examinations with confidence*
- *To train students in writing book reviews*
- *To make them write reports, resolutions, minutes*
- *To make them prepare agenda for meeting.*
- *To make students read books on Personality Development*

Unit I

- Comprehension

Unit II

- Spotting the Errors
- Sentence Improvement
- Voice
- Preposition
- Cloze Test or Numbered Gaps

Text Book:

Objective English for Competitive Examinations, Hari Mohan Prasad Uma Rani Sinha, Tata McGraw Hill Education Private Limited, New Delhi.

Unit III

- Book Reviews

Unit IV

- Report-Writing
- Preparation of Agenda, Resolutions, Minutes

Unit V

Extensive Reading – Self study – How to win Friends and Influence People – Dale Carnagie, Vermilian, London

SEMESTER – V
(For those who join in June 2015 and after)

Part – III Core Subject Theory		
Subject Title : **Biochemistry & Biophysics**		
Subject Code: **09CT51**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

5 hrs per week / Total 60 hrs

Objectives

To enable students to

- understand the structure and functions of the biomolecules
- study the properties and mechanism of enzyme action
- to understand the application of laws of thermodynamics

UNIT-I 12 hrs

a. Acids, Bases, Dissociation constant, indicators, p^H, Buffers, Electrolytes, isotopes,isomerism. Biologically important chemical bonds and their importance.

b. Classification, structure and properties of Carbohydrates, Lipids, Protein and Amino acids.

UNIT-II 12 hrs

a. Structure and function of cholesterol, biosynthesis of cholesterol.

b. Enzymes and Co enzymes: Classification and properties of enzymes-factors affecting enzyme action-Theories of enzyme action-Mechanism of enzyme action. Role of Coenzymes-isoenzymes.

UNIT-III 12 hrs

1. Metabolism of carbohydrates (Glycolysis, Glycogenesis, Glyconeogenesis and Glycogenolysis)
2. Metabolism of Protein (deamination, transamination, transdeamination and urea synthesis)
3. Metabolism of Lipid (β-oxidation, biosynthesis of glycerol)

UNIT-IV 12 hrs

1. Biological oxidation: Definition. The respiratory chain-oxidative phosphorylation- production of ATP and energy budget in the metabolism of major nutrients.
2. High energy compounds-definition-biologically important high energy compounds.

UNIT-V 12 hrs

1. Colloids –introduction. Types of colloidal solution-general properties of colloidal solution, Brownian movement, Osmotic pressure, dialysis, Donnan membrane equilibrium. Surface tension, Adsorption, hydrotrophy, diffusion (passive and active), transport across the cell membrane, pinocytosis, transport of ions.
2. Thermodynamics-definitions of different terms, Free energy, heat energy, enthalpy, entropy, exothermic and endothermic reactions. Bioelectricity - definition and measurement-action potential-membrane potential, Redox potential.

TEXT BOOKS

- Fundamentals of Biochemistry - A.C. Deb (2003) New central book agency, Kolkatta
- Biochemistry - N. Arumugam et. al (2006), Saras Publications, Nagarkoil.

REFERENCE BOOKS

- Subramanian, M.A., 2005. Biophysics- Principles and Techniques,M.J.P. Publication, Chennai.
- Fundamentals of Biochemistry - Ambika Shanmugam (2003), Madras Medical College, Chennai
- Biochemistry - Lehninger (2008), Kalyani Publications, New Delhi
- Biophysics - R.N. Roy (2006), Kolkatta
- Elementary biophysics – Salil Bose (1982), Jyothi books, Madurai.

SEMESTER – V
(For those who join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Biotechnology**		
Subject Code: **09CT52**	Hours per week: **7**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

5 hrs per week 60 hrs

Objectives

- Introduction of Biotechnology, tools and techniques t
- Introducing scope and application aspects of Biotechnology

Unit: I Introduction and Molecular Tools

Definition – Scope and importance- Biotechnology as an interdisciplinary pursuit - Intellectual Property Right (IPR) and Ethics in biotechnology

Enzymes – Restriction endonucleases (Type I, II & III), DNA-ligase, Reverse transcriptase, DNA polymerase, Terminal transferase - Linkers and Adaptors **Vectors** – pBR322, Ti plasmid, SV40 - Basic ideas about Phagemid, Cosmid, Bacterial Artificial Chromosome (BAC), Yeast Artificial Chromosome (YAC), Transposons as vectors, Shuttle and Expression vectors.

Unit-II Recombinant DNA Technology

Gene cloning in Prokaryotes - DNA-gene library, genomic library - cDNA library-Integration of DNA fragments into vector - Transfer of rDNA into bacterial cell- Screening of recombinants - Selection of recombinants - DNA- sequencing

Unit: III Techniques

Molecular techniques- Agarose Gel Electrophoresis – RFLP, RAPD, Polymerase Chain Reaction (PCR) – Blotting Techniques- Molecular probes and Hybridization- DNA finger Printing- Microarray

Animal Cell culture techniques: Basic aspects of Animal cell, tissue and organ culture - Immobilized cell culture - Insect cell culture-Whole embryo culture

Plant cell culture techniques: *In vitro* culture technique – Introduction for plant cell, tissue and organ culture

Unit-IV Applied Biotechnology

Animal-Transgenic animals-Sheep& Fish- Animal bioreactor and molecular farming - Products from animal cell culture - Tissue plasminogen activator (tPA), blood factor VIII, Erythropoietin (EPO)

Plant-Disease resistant plant production-Production of stress resistant plants – Insect resistant transgenic plants

Microbes-Biofertilizers, Biopesticides, Primary and secondary metabolites-Ethanol production- Single cell protein (SCP) - Biogas production- Biohydrogen- Mushroom culture

Unit - V Biotechnology in Medicine and Environment

Medicine: Recombinant vaccines - Improved contraceptives & Vaccines to control fertility-Antibiotic production- Penicillin., Monoclonal antibody production and its applications- DNA probes in diagnosis of diseases- Production of Human peptide hormones and insulin- Gene therapy

Environment: Genetically Modified Organisms (GMOs) for the management of environmental wastes - Bioremediation – i*n situ* and *ex situ* process- Microbial degradation of Xenobiotics – Biomining and Ore leaching.

Text Book

- Dubey R.C. (2012) A text book of Biotechnology, S .Chand and Company Ltd., New Delhi

Reference Books

- Das H.K (2007) Text Books of Biotechnology,Wiley Precise text books.
- Channarayappa, (2006) Molecular BiotechnologyPrinciples and practices, University Press.
- Satyanarayana U. (2008) Biotechnology, Books and Allied, Kolkatta
- Lohar S. (2005) Biotechnology Praksh MJP publications Chennai.

SEMESTER – V
(For those who join in June 2015 and after)

Part – III : Elective Subject Theory		
Subject Title : **Biostatistics, Computer Application & Bioinformatics**		
Subject Code: **09EP51**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

5 Hrs/ week 60 hrs

Objectives

- *Role of statistical applications in the study of biology*
- *Application of statistical tools and problems solving*
- *Basic computer programmes and internet*
- *Basics of bioinformatics to study genomics and proteomics*

UNIT- I 12 hrs

Scope of Biostatistics- Types of Data- Importance of data collection - its classification and Frequency distribution.

Representation of data- Diagrammatic and graphical methods – Bar (Simple, Composite and Percentage) Pie, Histogram and Frequency curve.

UNIT – II 12 hrs

Measures of Central tendency- calculation of Mean, (Arithmatic, Geomatric, Harmonic) Median and Mode- Their merits and demerits. Measures of Dispersion – Calculation of range, Quartile deviation, mean deviation, standard deviation, variance and co-efficient of variation

UNIT-III 12 hrs

Calculation of gene frequency in a Mendelian population- Chi- square analysis - Probability- Theorem and calculation – Students t- test

UNIT IV Introduction to computers. 12 hrs

History, Classifications of computer-main frame, mini, micro and super computer. Number systems -Decimal to binary . Popular software packages-Star, MS word, power point, MS Excel. Web and multimedia-Web browsers, E-mail, creating ID, management of mail.

UNIT V -Bioinformatics. 12 hrs

History and concepts of Bioinformatics.

Biological databases; Types of databases.

Genomics and proteomics

Basic and functional genomics - gene alignment, BLAST, Tools in BLAST. Multiple sequence alignment, CLUSTAL W- phylogenetic analysis-SwissProt- Expasy- Proteomic tools.

TEXT BOOKS

- Statistical methods for biologists- S.Palanichamy and S.Manoharan,2003Paramount Pub, Palani
- Bioinformatics for Beginners- Dr. K. Mani, N. Vijayaraj,2002. Kalaikathir Achagam, Kovai

REFERENCE BOOKS

- An Introduction to Biostatistics, 2004, S.Sundar Rao and J.Richard, Prentice Hall of India Private Ltd, New Delhi
- Introductory Practical Biostatistics, B.N.Misra *et al.*,1983,Naya Prakash, Kolkatta
- Bioinformatics- D.R Westhead, J.H. Parish and R.M. Twyman 2003.Viva Books, Pvt.Ltd, New Delhi.
- Bioinformatics, Lohar,P.S 2009, MJP Publishers, Chennai
- Fundamental concept of Bioinformatics- Dan E. Krane & Michael L. Raymer, 2003. Pearson.Edu. New Delhi.
- Recent advances in Bioinformatics-IrfarA.Khan. Atiya Khanum,2002, Ukaz. Pub. Hyderabad.
- Computer applications – Ms Office 2000 for everyone, Sanjay Saxena,Vikas Publishing house Pvt.Ltd, New Delhi.

SEMESTER – V
(For those who join in June 2015 and after)

Part – IV : Skilled Based Subject		
Subject Title : **Sericulture**		
Subject Code: **09SB51**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Total: 24 Hours

Objectives

- *Understand sericulture as a cottage industry and exposure to silkworm rearing*
- *Mulberry cultivation and pathology*
- *Awareness creation to make them an entrepreneur*

UNIT I (4 hours)

History of Sericulture – Sericulture as cottage industry - Types of Silk worms – Mulberry and Non-mulberry– Economic importance of silk and its by products

UNIT II (6 hours)

Mulberry cultivation – Methods of propagation – Irrigation – Manuring - Diseases and Pests of Mulberry – Control measures.

UNIT III: (6 hours)

Life cycle of *Bombyx mori* – Voltinism - Silk gland – Rearing House and appliances – Rearing methods- Pathology of silk worm and control.

UNIT IV: (4 hours)

Characteristics of Cocoons – Stiffling – Process of Silk reeling

UNIT V: (4 hours)

Identification of silk worm larvae, pupa and Imago, Morphology of silk gland, DFL, Rearing appliances and Chandrika

Text Books

- An Introduction to Sericulture, 2006,G. Ganga of J. Sulochana Chetty, Oxford & IBH, Publishing Company, NewDelhi

Reference books

- Principles of Sericulture, 1996, H.Aruga, Oxford & IBH, Publishing Company, New Delhi

SEMESTER – V
(For those who join in June 2015 and after)

Part – IV : Common Subject Theory		
Subject Title : **Environmental studies**		
Subject Code: **ESUG51**	Hours per week: **2**	Credit: 2
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

2hrs/week 24hrs

Objectives

- *Disseminate information of Environment of national and international issues*
- *Environmental consciousness creation among the students*
- *Facilitation of environmental leadership among students*

Unit-I 5 hrs

Introduction – Nature, scope and importance of Environmental studies – Natural Resources and conservation – forest, water and energy.

Unit-II 5 hrs

Ecosystem – concept – structure and function, energy flow, food chain, food web and ecological pyramids

Unit-III 5hrs

Biodiversity – definition, types – values – India, a mega diversity zone – Hotspots – Endangered and endemic species – threat to biodiversity and conservation

Unit-IV 5 hrs

Environmental pollution – Air pollution- causes and effect – Ozone depletion – Global warming – acid rain – Water pollution – Noise pollution – Solid waste management – Nuclear hazard

Unit-V 4hrs

Human population and the environment – Population growth – variation among nations – effects of population explosion – family welfare programme – environment and human health.

Text books

Environment studies – R.Murugesan (2009), Milleneum Pub. Madurai-16

SEMESTER – VI

(For those who join in June 2015 and after)

PART II – Paper I		
Subject Title **: English for Professional Excellence**		
Subject Code:**P2LE61, P2CE61**	Hours per week: 1	Credit: 1
Sessional Marks: **100**		Total Marks: **100**

Total number of hours: 15 hours

Objectives:

- *To make students face Competitive Examinations with confidence*
- *To prepare students to face interviews*
- *To make students familiar with books and authors in English literature*
- *To make students prepare resume*
- *To motivate students to participate in Group Discussion*
- *To make students read books on Personality Development*

Unit – I

- Sentence Completion
- Sentence Fillers
- Synonym
- Antonym
- Idioms and Phrases
- Substitution

Unit – II

- Sentence Arrangement
- Jumbled sentences
- Paragraph Reconstruction
- Analogy

Text Book

Objective English for Competitive Examinations, Hari Mohan Prasad Uma Rani Sinha, Tata McGraw Hill Education Private Limited, New Delhi.

Unit III

- Interview Skills – mock – interview.
- Debate, Group Disscussion, Resume Writing

Unit IV

- Books and authors in English literature

SEMESTER – VI

(For those who join in June 2015 and after)

Part – III Core Subject Theory		
Subject Title : **Evolution**		
Subject Code: **09CT61**	Hours per week: **5**	Credit: **5**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

5 hrs per week / Total 60 hrs

Objectives

- *Origin of life, natural selection, modern synthetic theory and their significances*
- *Focus on species concept and distribution of animals*
- *Fossil evidences of man and horse*

Unit – I 12 hrs

a) Origin of Life: Oparin-Haldane Theory, Evidences for Evolution from Morphology and comparative anatomy, Embryology, Physiology and Biochemistry.

b) Lamarckism and Neo-Lamarckism

Unit – II 12 hrs

a) Darwinism: Natural selection, Neo-Darwinism – Types of selection-Experimental evidences.

b) Modern synthetic theory- Hardy-Weinberg's Law – Behaviour of genes in natural population. Genetic Drift – Evolutionary Significance.

Unit - III 12hrs

a) Species Concept – Sub Species and Sibling Species, Allopatric and Sympatric Speciation, Isolating Mechanism – Types and Examples

b) Distribution of Animals – Barriers – Continental Drift Hypothesis, Extinction – Types and causes. Mimicry and colouration.

Unit – IV 12 hrs

a) The Geological Records – Geological time scale– Survey of Geological periods

b) Fossils: methods of fossilisation -types-Methods of detection - Lead and Carbon Method.

Unit –V 12 hrs

a) Adaptive Radiation in Mammals.
b) Evolution of Man- Biological and cultural.
c) Evolution of horse- Orthogenesis.

Text Book

- Organic Evolution-Veerabala Rastogi,2005,Kedarnath Ramnath Pub.

Reference Books

- Evolution-Strickberger, 1994, ELBS Publishers.
- Introduction to evolution-P.A.Moody,1995, Kalyani Pub,New Delhi.
- Evolution –T.Dobzhansky *et al* 1990, Surjeet Pub.
- Life – origin, Evolution and adaptation, Chartto paothyay, 2002, Books and Allied P Ltd, Kolkata.

SEMESTER – VI
(For those who join in June 2015 and after)

Part – III : Core Subject Theory		
Subject Title : **Microbiology & Immunology**		
Subject Code: **09CT62**	Hours per week: **4**	Credit: **4**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

4hrs/week 48hrs

Objective

- ❖ To understand the basic principles and applications of microbiology and immunology

Unit I

History and scope of Microbiology: Classification of microorganisms- Structural features of Bacteria, Virus, Actinomycetes and Fungi: Reproduction of Viruses (T4 Phage and HIV)

Bacterial growth and nutritional requirements: Culture of Microorganisms – Types of culture media, Cultural characteristics of bacteria, Isolation and enumeration, methods and maintenance of culture; preservation of microbes, reproduction in Bacteria – Conjugation, Transformation and Transduction

Unit II

Food Microbiology: Fermented food, Food spoilage, Food poisoning, physical and chemical methods in food preservation.

Soil Microbiology: Common soil microbes; symbiotic and asymbiotic organisms; physiology of nitrogen fixation.

Water Microbiology: Coliform bacteria and MPN, Estimation of Total Plate Count, Index, Faecal Streptococci.

Unit III

Study of common bacterial and viral diseases of man – Causative organisms, mode of transmission, pathogenicity, symptoms and their preventive measures

Diseases of Gastro – Enteric System – Cholera, Typhoid. Respiratory System – Diphtheria, Tuberculosis. Nervous System – Leprosy, Polio and Rabies – Genital System – AIDS, Fungal Diseases

Unit IV

Immune system – Types of Immunity – Innate and acquired immunity: Passive and active

Lymphoid organs – Primary and secondary organs, GALT & BALT. Lymphocytes – Sub-Population of T&B Cells

Immunoglobulin – Types, structure and functions-Antigen-Antibody reactions – Vaccination principles – Vaccines – Preparations and immunization

Unit V

Immune Response – Acquired immune response – Humoral immunity and Cell Mediated Immunity – Complements – classical and alternate pathway – MHC and HLA – Structure and function.

Immune techniques – principles of precipitation – VDRL slide test, Double immuno diffusion and Immuno-electrophoresis – ELISA and Radio Immuno Assay.

Hypersensitivity, transplantation – grafting – immune deficiency-Types and diseases.

Text Books

- Pelczer M.J *et al.,* (2010) Microbiology, Mcgraw Hill Book Company, New Delhi
- Ananthnarayanan,& Jayaram Panicker, (2010) Text Book of Microbiology, Universities Press

Reference Books

- Gangal *et al.,* (2013), Text Book of Basic and Clinical Immunology University Press (India) Pvt, Ltd, Hyderabad
- Hannigan *et al.*, (2010) Immunology, Scion Pub ltd, UK
- Sharma, P.D. 1998. Microbiology, Rastogi Publications
- Meena Kumari S. 2005 Microbial Physiology, M.J.P. Publishers , Chennai
- Vijaya Ramesh, K. 2005, Environmental Microbiology, M.J.P. Publishers Chennai
- Kuby, T.(1994) Immunology, P.G. Publishing Pvt., Ltd., New Delhi

- Tizard I.R.(1995) Immunology – An Introduction IV ED. Saunders College Publications, Philadelphia

SEMESTER – VI
(For those who join in June 2015 and after)

Part – III : Core Subject Practical III		
Subject Title : **Bio-Series, Evolution, Environmental Biology, Microbiology & Immunology**		
Subject Code: **09CP63**	Hours per week: **2**	Credit: **6**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

SEMESTER – V
Bio-Series, Evolution, Environmental Biology, Microbiology & Immunology

Biochemistry &Biophysics
Objectives

- Experiments to observe certain physiological aspects
- Analysis of blood and water samples

1. Study of salivary amylase enzyme activity. Effect of temperature and p^H
2. Tests for albumen, Sugar and Urea in Urine.
3. Qualitative tests for carbohydrate, protein and lipid.
4. Study of p^H meter and measurement of p^H of various water samples.
5. Estimation of Ascorbic acid (Vitamin-C)
6. Analysis of Slide Preparation: Haemin and Uric acid crystals.

Biotechnology
Objectives

- Screen industrially important microbes
- Isolation of genomic and plasmid DNA
- Cell immobilization and demonstration of electrophoresis, PCR and blotting techniques.

1. Primary screening of industrially important microbes
2. Isolation of Genomic DNA
3. Isolation of Plasmid DNA
4. Demonstration of Agarose gel Electrophoresis
5. Immobilization of yeast cells
6. PCR demonstration
7. Spotters - Typical gene cloning experiment, Electrophoretic apparatus, Southern blotting, Northern blotting and DNA sequencing

SEMESTER – VI

Evolution, Environmental Biology, Microbiology & Immunology

Evolution

Objectives

- Finger print study and experiments with beads to understand evolutionary concepts
- Principles of natural selection and genetic drift in large and small population
- Evolutionary importance of chosen animals.

1. Variation in finger prints in Man.
2. Experiment with beads to illustrate gene pool concept & production of genotypes
3. Experiment to study natural selection in large population
4. Experiment to study principles of genetic drift in small population.
5. Spotters- Homologous and Analogous organs, Evolutionary importance of *Peripatus*, *Limulus* and *Nautilus*, Study of vestigial organs, Petrified fossils (Stone fossil)

Environmental biology

Objectives

- Observation of eco system
- Estimation of ecological parameters

1. Morphometric study of fresh water pond
2. Food web and Food chain
3. Identification of fresh water and marine plankton
4. Animal association

5. Estimation of dissolved oxygen in water samples
6. Measurement of soil temperature, pH and moisture

Microbiology

Objectives

- Introduction of basic techniques in microbiology
- Principles and uses of microbiological instruments

1. Cleaning of glass wares – Sterilising media and equipments
2. Preparation of media for Microbes.
3. Distribution of microbes in Nature- Soil, Water and in Air.
4. Cultural characterisation of Bacteria
5. Simple staining of bacteria
6. Differential staining of bacteria – Gram staining.
7. Microscopic examination of live bacterial population. Hanging drop technique
8. Spotters: Autoclave/ pressure cooker and Colony counter.

Immunology

Objectives

- Dissection & observation of lymphoid organs
- Introduction of basic techniques in Immunology

1. Dissection to show lymphoid organs in Chick.
2. Observation of spleen cells-Slide.
3. Bleeding and serum separation.
4. Demonstration of agglutination by blood group antigen.
5. Demonstration of R.B.C. and W.B.C. count.
6. Spotters : Various Lymphoid organs in chick and human

UG Summative Practical Examination
Model Question Paper pattern

Time:4 Hrs Maximum marks: 60

1. Major Practical – I	15
2. Major Practical – 2	15
3. Minor	10
4. Spotters - 4	10
5. Observation note book	10

SEMESTER – VI
(For those who join in June 2015 and after)

Part – III : Elective Subject Theory		
Subject Title : **Dairy Farming**		
Subject Code: **09EP61**	Hours per week: **3**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Knowledge on various dairy breeds of indigenous and exotic breeds.*
- *Skill development in milk processing and associated activities.*
- *Knowledge on various diseases of dairy animals.*
- *Prepare rural youth /self employment for accepting dairy farming as profit making.*
- *Create awareness about the breeds and opportunities and awareness in dairy farming*

UNIT I:

a. Scope of Dairy farming, Dairy breeds of India – both cows and buffaloes – Exotic cow breeds.
b. Systems of breeding – Hybrid vigour – grading up merits and demerits of inbreeding and outbreeding.

UNIT II:

Common cattle feed – their nutritive value – minerals, feed additives and silage preparation.

a. Feeding and management of pregnant cow and calf

UNIT III:

Viral diseases – rinderpest, Foot and mouth disease
Bacteiral diseases – Mastitis, Anthrax, Haemorrhagic – septicaemia

a. Metabolic diseases – Milk fever and bloot.

UNIT IV:

a. Milk – composition and Nutritive value, Colostrum and their importance
   Pasteurization of milk
   Techniques to detect milk adultration, Spoilage of milk
b. Preparation of Dahi, Butter and Ghee.
   Role of co-operative societies in milk production and Marketing.

UNIT V:

a. Housing and equipments for dairy cows.
b. Artificial insemination – Semen collection and storage

Text Books

- G.C. Banerjee 2012 - A Text book of Animal Husbandry – Oxford & IBH Publication, New Delhi.

Reference Book

- Outline of Dairy technology, 2008, Sukumar De, Oxford University Press

SEMESTER – VI
(For those who join in June 2015 and after)

Part – III : Elective Subject Theory		
Subject Title : **Environmental Biology**		
Subject Code: **09EP62**	Hours per week: **4**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- ❖ *Study of reciprocal relationships between organisms and their environment*
- ❖ *Significance of environmental degradation, biodiversity conservation, environmental legislation and education*

UNIT-I Ecological media and Abiotic factors 12 hrs

Introduction and scope - Soil profile and fauna: Water- properties, water problem in terrestrial habitat.

Light- light in relation to aquatic habitat, effect on organisms- Temperature-range, thermal stratification, tolerance, homeothermic, Poikilothermic animals, adaptations to extremes of temperature and effects on organisms.

UNIT-II Animal relationships and Ecosystem 12 hrs

Interspecific relationship- Symbiosis- Mutualism and Commensalism, Antibiosis, Parasitism, Predation and Competition- Intraspecific relationship- Colonisation, aggregation and social organization.

Ecosystem- Definition, components, Pond and forest as an ecosystem- trophic levels, Food chain and Food web- Ecological pyramids, energy flow and productivity, Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

UNIT-III Community and Population Ecology 12 hrs

Community- Definition, structure and characteristics- Ecotone, edge effect and ecological niche- community dynamics- ecological succession and climax community.

Population ecology- characteristics- Natality, Mortality, Dispersal, age pyramid, population estimation- Regulation and dynamics of population.

UNIT-IV Habitat ecology 12 hrs

Characteristics, Zonation and fauna and adaptations of fresh water, marine and estuary habitats. Terrestrial habitats- forests, deserts, caves, fauna and their adaptations.

UNIT-V Environmental pollution and Bio resource conservations 12 hrs

Environmental pollutants- Types- Air pollution- Sources, Effects and control measures- water pollution- Sources, Effects and control measures- Radioactive and Noise pollution. Natural Resources:Wild life - Conservation and management.

TEXT BOOKS

- Rastogi, V.B and Jayaraj, M.S, 1984. Animal Ecology and distribution of animals, Kedarnath, Ramnath, Meerut.
- Verma, P.S and Agarwal, V.K 2000. Environmental biology, S.Chand & Co, New Delhi.

REFERENCE BOOKS

1. Odum, E.P 1983. Basic Ecology, Saunder's College Publishing, New York.
2. Rana, S.V.S. 2009. Essentials of Ecology and Environmental science, Prentice- Hall of India, New Delhi.
3. Arora, M.P. 2011. Ecology, Himalaya Publishing house, New Delhi

SEMESTER – VI
(For those who join in June 2015 and after)

Part – IV : Skill Based Subject		
Subject Title : **Fish culture**		
Subject Code: **09SB61**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Impart the knowledge on common food fishes and enhancement of fish productivity*
- *Management and maintenance of fish pond and various types of fish culture*
- *Common fish diseases, treatment and control measures*

UNIT I: (5 hours)

Scope and importance of aquaculture – Physical and Chemical characteristic features of water bodies– Types of culture systems (Traditional, intensive, semi-intensive and extensive)

UNIT II: (5 hours)

Selection of cultivable species – Site selection for fish farming – construction of fish ponds – Types of fish ponds – Maintenance and management of ponds. Fish Feeds

UNIT III: (5 hours)

Types of culture – Monoculture, Monosex-culture and Poly culture – Integrated fish farming (paddy cum fish culture – Induced breeding

UNIT IV: (4hours)

Common fish diseases - Prevention and treatment

UNIT V: (5 hours)

Identification of common edible fishes
Fish food organisms
Ornamental fish culture

Text Books

- Fish Culture 1993 G. Santhanakumar, JJ publications

Reference books

1. An introduction to fishes 2011 S.Khanna, Silver line publications
2. Fish & Fisheries 2010 Pandey & Shukla, Rastogi PulicationsA manual of Fresh water Aqua culture 1997 R. Santhanam, Oxford and IBH Pub.

SEMESTER – VI
(For those who join in June 2015 and after)

Part – IV : Skill Based Subject		
Subject Title : **Vermi Technology**		
Subject Code: **09SB62**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Total: 24 Hours

Objectives

- *Role of vermitechnology for sustainable agriculture and environmental management*
- *Salient features of exotic and indigenous earthworm species*
- *Products from vermitechnology*

Unit I

Features of Exotic species and indigenous species for vermicomposting

Unit II

Rearing and culturing – Vermicompost Unit – vermibed preparation Precomposting - composting by earthworms – methods – management – harvesting of vermicast.

Unit III

Vermicast – characteristics – qualitative analysis - Vermiwash – characteristics – vermiwash unit - preparation, collection and analysis

Unit IV

Application of vermicomposting in Agriculture and horticulture – Economics of vermiculture

Unit V

Earthworms in pollution control and waste land development. Earthworms as food and medicinal importance - Role of KVIC and NABARD

Text book:

- **Vermiculture,** 2012 M.Seetha Lekshmy and R.Santhi, Saras Publication

Reference books

- Vermicomposting for sustainable agriculture (2003): BK Gupta – Agrobios

SEMESTER – VI
(For those who join in June 2015 and after)

Part – IV : Skill Based Subject		
Subject Title : **Zoology for Competitive Examination**		
Subject Code: **09SB63**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Total: 24 Hours

Objective

- To Prepare the students for Competitive examinations

UNIT I

a) Non - Chordata:- General organisation - Classification with diagnostic features up to classes. Protozoa:- Structure, reproduction and life history of Amoeba Paramecium, Trypanosoma, Plasmodium, Monocystis, Leishmania - locomotion, nutrition, economic importance. Porifera: Sponges canal system, skeleton, reproduction and economic importance. Coelenterata:- Diploblastic organization - life history of obelia and Aurelia, Metagenesis - Polymorphism in Hydrozoa Corals and Croal formation - relationships of Chidaria and Acnidaria. Helminthes:- Structure and life history of Planarai, Fasciola, Teania, Ascaris and Wucheraria - parasitic adaptations - Helminths in relation to man. Annelida:- Neries, earthworm and leech - Coelom and metamerism - modes of life in polychactes. Onychophora:- Structure, affinities and

distribution of Peripatus. Arthropoda:- Prawn, Scropion and Cockroach - Larval forms and parasitism in Crustacea - Mouth parts, vision, respiration and excretion Metamosphosis and social life in insets. Mollusca:- Freshwater mussel, pila, sepia - oyster culture and pearl formation. Echinodermata:- General organisation - Water vascular system Larval forms and affinites.

b) Prochordata:- Amphioxus, Balanoglossus - Ascidian retrogressive Metamorphosis, neoteny and affinities. Chordata:- General Organisation - Characters, Outline classification Up to class level. Pisces:- Locomotion, migration, respiration, economic importance structure and affinities of Dipnoi. Amphibia:- Origin of Amphibians - Parental care - South Indian amphibians. Reptiles:- Origin - Conquest of land - adaptations to live on land adaptive radiation - Temporal Vacuties - identification of poisonous and non-poisonous snakes - poison apparatus - south Indian examples. Birids:- Origin - fight adaptations - mechanism of flight - double respiration - migration - Flightless birds, their structure and distribution. Mammals:- Dentition, skin derivatives - distribution - adaptive radiation - Protothria and Metatheria, their Phylogenetic relationship - South Indian examples.

UNIT II

a) Cell and Molecular Biology:- Cellular Organelles - Structure and function - Plasma membrane, mitochondria, golgi bodies, endoplasmic reticulum and riboscomes - Nucloelus and nucleus - Chlorosplast - Cell division (Mitosis & meiosis) - Chromosomes - DNA structure and function, replication of DNA, Genetic code - RNA and protein synthesis. Gene expression - Recombinant DNA, Genetic cloning - Genetic engineering, its uses in agriculture, biology and medicine - Sex chromosomes and sex determination.

b) Genetics:- Laws of inheritance - Linkage, principle of gene mapping multiple alleles, blood groups - mutation (Natural and induced) Sex Linked and Sex Limited inheritance - Chromosome number and form ploidy - cytoplasmic inheritance - Karyotypes - Normal and abnormal genetic disorder - Bio-chemical genetics - regulation of gene expression in prokaryotes and Eukaryotes - population genetics - Eugenics. Mean, Median and standard deviation.

UNIT III

a) Bio Chemistry:- Structure of carbohydrates, amino acids, proteins lipids - Glycolysis and Kre'bs cycle - oxidation, reduction - oxidative phosphorylation - energy conservation and release, cyclic AMP, ATP

enzymes - mechanism Hormones, their classification biosynthesis and function. Physiology:- With reference to mammals, digestion, nutrition, balanced diet in man - assimilation, intermediary/metabolism. Composition of blood - Coagulation, Transport of oxygen, Carbondioxide, Blood pigments, Mechanism of respiration, Muscles, mechanism of muscle contration, Temperature regulation, Acid base balance and homestasis, Nerve impluses and conduction, neurotransmitters. Receptors, photo, phono and chemopreception. Nephron and urine formation, Endocrine glands, ovary and pituitary organs and their inter relationship, Physiology of reproduction in humans, Normal Zoology development in insects and pheromones. Bioluminescence, Biological rhythms, Physiology of immune response Antigens - Immunoglobulins, humoral and cell mediated immunity. T & B cells, mechanism of antibody formation - AIDS.

b) Development Biology:- Gametogenesis - fertilization - type of eggs - blastulation and gastrulation in Amphioxus, frog and chick morphogenetic movements - organizer potency, organogenesis with reference to hear, eye kideny brain - Formation and fate of extra embryonic membranes in chick. Placenta, types, functions, Regeneration - Aging and senescene - metamorphosis in Frog - Cancerous growth.

UNIT IV

a) Environmental Biology:- Biotic and abiotic factors, their role, Intra and interspectic association. Biogeochemical cycles. Ecosystem, concept and components - energy flow, food chain, food web, trophic levels. Ecological succession, Community structure - Stratification. Population and Population dynamic - Habitat, ecology, adaptations in marine fresh water and terrestrial habitats. Wild life, need for conservation management and methods of conservation. Sanctuaries with special reference to Tamil Nadu. Pollution - air, water and land - Perspective policy planning for the environment.

b) Evolution:- Origin of life - Evolutionary thought - Contributions of Lamarck Darwin and De Varies - present status of Darwinism and Lamrkism - modern synthetic concept - Hard Weinber Law - Polymorphism and mimicry in evolution. Specification, species concept - Isolation mechanisms and their role, role of hybridization in evolution. Fossils and Fossilization Origin and evolution of man - Culture evolution and Biochemical evolution.

UNIT V

a) Animal distribution: Zoogeographical distribution - Continental and island fauna - Continental drift - Discontinuous distribution adaptive radiation. Natural resources and their conservation. Alternative sources of energy.

b) Economic Zoology:- Parasitism and Commensalim - Protozoan Parasites and diseases, helminth parasites and diseases of man and domestic animals - Beneficial and destructive insects Insect pests on crops and stored products - Control methods. Sericulture, apiculture, poultry, pisciculture and induced breeding, Shell fisheries, Aquaculture practices in Tamil Nadu and their impact on the environment and on agriculture.

SEMESTER – VI
(For those who join in June 2015 and after)

PART – IV : Common Subject Theory		
Subject Title **: Value Education**		
Subject Code: **VEUG61**	Hours per week: **2**	Credit: **2**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

UNIT I - The heart of Education:

Introduction – Eternal Value – Integrated approach to value education - one for all and all for one – Responsibilities of a citizen – Habit Vs wisdom – purifying mind pollution – Respect for all Religions – Parents, teachers and fellow students – The need and benefit of exercise and meditation for students.

UNIT II The Value of Body and Life Energy

Introduction – what are the causes for paid, Disease and death? Three Basic needs for all living Beings – Personal Hygeine Five Factors of Balance in Life – The need and benefits of physical Exercise – The value and Base of Life energy – The value and Base of Bio-magnetism - You are your own best caretaker.

The Marvelous nature of mind

Introduction- Bio-magnetism – The base of the mind – characterisation of the Genetic Centre – metal frequency – practice for a creative mind - benefits of meditation.

UNIT III Analysis of Thought

Introduction – An Explosition on the nature of thought– six roots for thoughts – Introspection for analysis of thoughts-practical techniques for analysis of thoughts.

Benefits of Blessings

Effects of good vibrations – Make Blessing a Daily Habit

UNIT IV: Moralisation of Derive

Introduction – moralization of desire - Analyse your desires – Summary of practice.

Neutralision of Anger:

Introduction – meaning – characteristics of Anger – Anger is a Destructive emotion – Anger spoils our relationship with others – Some common misconception about anger – will power and method success through awareness – method of neutralisation of anger.

UNIT V: Eradication of Worries

Worry is a mental disease – Nature's Law of cause and effect – factors beyond our control – How to deal with problems – analyse your problem and eradicate worry

Harmonious Relationships

Introduction – Three angles of life – The value of harmony in personal relations – Love and Compassion – pleasant face and loving words – appreciation and gratitude to parents and teachers – Bringing needed reforms in educational institutions – Why should we serve others? Brotherhood – A scientific Basis for Universal Brotherhood protection of the environment – non-violence and the five fold moral culture.

Text Book: Value Education for Health, Happiness and Harmony

(Based on the Philosophy and Teachings of Swami Vethanthiri Maharisi)

Published By: Brain Trust, Aliyar A Wing of World Community Service Centre

SEMESTER – VI

(For those who join in June 2015 and after)

PART – V : Common Subject Theory		
Subject Title **: Extension Activities**		
Subject Code: **EAUG61**	Hours per week:	Credit: **1**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

UNIT-I: Community Development-I

Definition – structure and composition – community based issues – need for awareness – Developmental Programmes.

UNIT – II: Community Development–II

Rural Scenario – need of the Community – need for the community service – role of youth in community building – communal harmony – literacy – Educational Recreation.

UNIT – III: Volunteer Empowerment

Women's Emancipation – formation of Youth Clubs – Self-Help Groups – Youth and Development.

UNIT – IV: Social Analysis:

Social issues – cultural invasion – media infiltration – human rights Education/Consumer Awareness – Adolescents Reproductive – HIV/AIDS/STD – Social harmony/National integration – Blood Donation.

UNIT – V: Introduction to NSS:

Basic Concepts – profile – aims – objectives – symbol – Motto – structure – Regular activities – Special Camping Programme – Adventure Programme – National Days and Celebrations.(Applicable to NSS Students)

(OR)

NCC - Origin – Organisation – Ministry of Defence – Armed forces – commands – Defence establishments in Tamil Nadu Civil Defence – Aid to civil authorities – Disaster management – Leadership – Man management – Adventure activities – Social service

Reference: National Service Scheme Manual (Revised), Ministry of Human Resources Development, government of India.

B.Sc. Chemistry and B.Sc. Botany (Ancillary Zoology)
(For those who join in June 2015 and after)

Part – III : Allied Subject Theory		
Subject Title : **Animal Organisation**		
Subject Code: **09AT01**	Hours per week: **4**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Fundamental course that provides basic understanding of biology of invertebrate and chordate.*
- *Study of salient features of invertebrates and chordates*

Unit-I

1. Principles of taxonomy – Binomial nomenclature - Animal Organisation – body types – protozoa – metazoa – types of coelom – types of symmetry

2. Outline classification of Invertebrates and the salient features of the Phyla with examples. Outline classification of Chordates upto classes giving exampls

Unit – II

1. Feeding and digestion in Amoeba, Hydra and Frog.
2. Respiration in Amoeba, Cockroach, Gills in Fish and Lungs in bird.

Unit – III

1. Circulatory system in Paramecium, Earthworm and Calotes.
2. Locomotion in Amoeba, Paramecium and Earthworm: Flight mechanism in Pigeon.

Unit – IV

1. Nervous system of Earthworm: Human brain.
2. Receptors – photoreceptors of Euglena, insects and man. Human ear.

Unit – V

1. Excretion in Amoeba, Earthworm and Man.
2. Reproductive system of Rabbit.

Text books

- A Text Book of Invertebrates –2014. Nair *et al.*, Saras Publications.
- A Text Book of Chordates – 2014. Thangamani, *et.a.l.*, Saras Publications

Reference Books

- Chordate Zoology 2011 Jordan & Verma, S.Chand & Co Ltd
- Invertebrates 2011 R.L.Kotpal, Rastogi Publications
- Vertebrates 2011 R.L.Kotpal, Rastogi Publications

B.Sc. Chemistry and B.Sc. Botany (Ancillary Zoology)
(For those who join in June 2015 and after)

Part – III : Allied Subject Theory		
Subject Title : **Biology and Human welfare**		
Subject Code: **09AT02**	Hours per week: **4**	Credit: **3**
Sessional Marks: **25**	Summative Marks: **75**	Total Marks: **100**

Objectives

- *Knowledge on viral, bacterial fungal, protozoan and helminthes disease and their control.*
- *Entrepreneurial avenues in Sericulture, Fish culture, Vermiculture, Mushroom and Apiculture.*

Unit I

Structure of a typical virus – Viral diseases – Chicken pox, Polio, Rabies, Mumps, Influenza, and AIDS.

Unit-II

Structure of typical Bacteria – Bacterial diseases – Cholera, Tuberculosis and Tetanus.

Unit III

Fungal diseases – Ringworm and Black piedra. Protozoan diseases – Amoebic dysentery and Malaria.

Helminth parasites – Ancylostoma, Wucheraria, Ascaris and Tapeworm,

Unit IV

Sericulture – Scope – Silkworm biology –Life cycle – common diseases and control- Silkworm rearing methods.

Fish culture – Scope and Importance – Types of culture – Identification of common edible fishes - Induced breeding - common diseases and control – maintenance of fish pond.

Vermiculture – Features of exotic and indigenous species – rearing and culturing – Characteristics of Vermicast and Vermiwash – Economics of vermiculture

Unit V

Biogas production – characteristic features of biogas – production of biogas – uses Mushroom culture – nutritive and medicinal value – Morphology of Indian oyster mushroom – cultivation of paddy straw mushroom - Advantages

Apiculture – biology of honey bees – bee hive – honey extraction – medicinal value – bee wax and bee venom

Text Book:

Text Book of Microbiology 2004, Ananthanarayanan, Orient Longman.

Reference Books

- Text Book of Preventive and Social Medicines 2011 Park, M/s Banarsidas Bhanot Publications.
- Vermicomposting for sustainable agriculture 2005 Gupta, Agrobios.
- Handbook on Mushrooms 1988 Nita Bahi, Oxford and IBH.
- An Introduction to Sericulture 1997 Ganga shetty, Oxford and IBH.

B.Sc. Chemistry and B.Sc. Botany (Ancillary Zoology)
(For those who join in June 2015 and after)

Part – III : Allied Subject Practical		
Subject Title : **PRACTICAL-I**		
Subject Code: **09AP03**	Hours per week: **2**	Credit: **1**
Sessional Marks: **40**	Summative Marks: **60**	Total Marks: **100**

Objectives

- *Identification of all classes of invertebrates and vertebrates.*
- *Unrevealing anatomical features of invertebrate and chordate*
- *Exposure to applied zoology to make them self-employable*

1. Observation of the following -Spotters

- Paramoecium conjugation
- Obelia (entire)
- Hydra (entire)
- Taenia (entire)
- Scolex of Taenia

- Ascaris male and female
- Neries (entire)
- Penaeus
- Pila (entire) and shell of Fresh water mussel)
- Starfish (entire)
- Amphioxus, Balanoglossus, Scoliodon
- Cobra, Viper, Pigeon
- Skull of Pigeon dorsal and ventral view
- Pectoral girdle of pigeon
- Fore and hind limb of Frog
- Synsacrum of bird

2. Simple staining of Bacteria from milk and sewage water.
3. Mounting of mouth parts of Mosquito, Housefly and Honey bee.
4. Identification of Ascaris (male & female) and Tapeworm.
5. Identification of egg, larva, pupa and adult of silk moth.
6. Dissection to show silk glands.
7. Common appliances used in silkworm rearing and apiculture.
8. Visit to Biogas production, Mushroom culture and Fish culture centres.

DEPARTMENT OF ZOOLOGY
CERTIFICATE COURSE IN PHOTOGRAPHY

UNIT-I: HISTORY AND SCOPE OF PHOTOGRAPHY

a) History of Photography-Conventional and Digital

b) Scope of Photography

Photography as an art - Scope in commercial field - Social functions - Industrial field - Scientific field-Political field

UNIT-II: PRINCIPLE OF PHOTOGRAPHY

a) Properties of light

Dispersion – Reflection – Transmission – Absorption

b) Controlling of light

Pin hole – Lenses

c) Image formation

Direct image – Inverted image

d) Recording of an image.

e) Studio lights

UNIT-III: FOCUS ON CAMERA

a) Types of Camera

Box type, TLR, SLR, Professional, Miniature, Subminiature, Underwater, Space, Cine, Video and Digital SLR.

b) Basic Components of a Camera:

Lens, Shutter, diaphragm, viewfinder, film chamber etc.

c) Accessories of a Camera:

Lenshood, Lens cap, Tripod stand, Cable release, Lux meter, Flash unit, Camera case and Tripod Panoramic views.

d) Working mechanism of TLR and SLR Cameras.

UNIT-IV: STUDY OF LENS FILMS AND FILTERS

a) Lens:

Concept, focal length, Compound lens and Standard lens, Wide angle lens, Telephoto lens and Zoom lens and their application.

b) Films:

Classification – Contrast, Resolving Power, Slow, Medium and Fast films.

c) Filters:

Types and application.

UNIT-V: EXPOSURE TECHNIQUE

a) Composition

b) Exposure – Lighting Condition – aperture setting – Judging the distance – Shutter speed selection – Exposure on moving objects – Dept of field – use of flash – Silhouette.

UNIT-VI:

a) Digital Photography

b) Basic Principles & Parts of a Digital Camera

c) Operation of Digital Camera

d) Loading the pictures on to a computer-Memory Card and Reader.

e) Copying the pictures on a CD

f) Printing the pictures in different ways.

PRACTICALS:

1. Demonstration of various parts of a Camera.
2. Demonstration of various types of a Camera.
3. Demonstration of Inverted image formation.
4. Observation of various types of lenses.
5. Observation of accessories used for a camera.
6. Composing technique.
7. Demonstration of Photoshop an digital creative technique.

DEPARTMENT OF ZOOLOGY

CERTIFICATE COURSE IN VIDEOGRAPHY

UNIT-I:

History and Scope

UNIT-II:

Basic Techniques of Camera work – Camcorder functions – Aperture and exposure – Depth of field – Focusing – Framing – Panning – Tilting – the Zoom lens – handheld Camera work – using a tripod – recording sound – colour and contrast – basic lighting.

UNIT-III:

Controls and functions in a video camera – M3000 play back – playback via T.V.Set.

UNIT-IV:

Preparations: Using the Battery pack – setting the clock – setting the view finder – Inductions in the view finder – warning and alarm indicators – inserting the video tape – Using the on-screen display – others.

UNIT-V:

Shooting: Holding the Movie Camera for shooting – shooting steps – checking the recorded scene – camera search – shooting with clean edits – shooting a still picture – shooting with strobe effect – shooting with zoom function –shooting with fade function – Tracer function – shooting backlit scenes – iris adjustment – shooting in the dark – shooting with the macro function shooting fast moving subjects.

UNIT-VI:

Dubbing and editing: Dubbing – Insert editing – Audio dubbing.

UNIT-VII:

Mixing:

a) Features of a mixing unit – precautions – Major operating controls and their function – system connections – operating procedure – mix/wipe effect – digital effect – super imposing effect and back colour – Fade control – Audio mixer.
b) Character generator and pattern maker. Features and use.
c) Chromo key functions.

UNIT-VIII:

Trouble shooting and service: symptoms – Cause – Action in power source, shooting and play back.

UN IT-IX:

Cautions: Video head clogging – condensation forms inside the video camera – cautions for use of video camera – cautions for surroundings – cautions for connections – cautions for storage and transportation – after use – cautions for the battery pack – cautions for storing the battery – cautions for the AC. Adaptor.

UNIT-X:

Standard and optional – Accessories of a video camera.

UNIT-XI:

Video Coverage: Children – informal parties – Family outings – special occasions – wedding and ceremonies – Travel videos – sports and action – nature – adventure activities.

UNIT-XII:

Making documentaries: Writing a commentary – Demonstration videos – promoting a cause – Business Videography – Advertisement movies – Science pictures – Drama and video film – production script.

UNIT-XIII:

Video Profession: Video Library – Video Theatre – Video studio – Editing Theatre – Video Tape industry – Video and Law.

PRACTICALS:

1. Study of controls and functions in video camera M 3000
2. Preparation for shooting
3. Shooting practice – Panning Tilting and Zooming
4. White Balance
5. Shooting with different functions – Mix/wipe effect, digital effect, superimposing and fade control.
6. Recording of Date and Time
7. Editing and Audio Dubbing
8. Trouble shooting and remedies
9. Character generation and pattern making (demonstration only)
10. Operation of mixing unit – demonstration only
11. Video coverage – Video making for an advertisement
12. Video coverage of a live programme – Each student is expected to produce a video coverage.
13. Script writing for a given subject.

DEPARTMENT OF ZOOLOGY

CERTIFICATE COURSE IN GANDHIAN THOUGHT
PART I-MAHATMA GANDHI'S LIFE

1. The Beginnings of a Mahatma: The Early Life of Gandhi: Settings and Tradition, Home, School, and Other Influences – Early Marriage – His London Life: The Light begins To Shine.

2. The South African Laboratory And The Making of the mahatma: A fateful journey and transmation – From a barrister to a Peace maker-working for the oppressed and the vivtims – Religious guest – Discovery of sarvodays – From family life to Community Life – Ashram experiments – Self-control – Living With Nature: Bread Labour Nature Cure And Simple Life – Beginning of Constructive work – discovery of sathyagraha – experiments in education.

3. The Indian Phase I: Under Standing India – Shantiniketan to Sabarmathi – micro Level Satyagraha for the welfare of the peasants and workers: champaran,

Ahamedabad and kheda satygrahas – Birth of khadi – Rowlatt Bills – Khilafat Movement –Noncooperation movement.

4. The Indian phase II: Growth of constructive work civil disobedience,salt satyagraha, Round table conferences, Constructive work further veoles – Individual satyagraha & Quit India movement – Quenching the communal Fire and shanti esna experiments – The supreme sacrifice and beyond.

PART II – MAHATMA GANDHI'S AGE

5. The British expansion in India and the early Indian Resistance – 1857 Revolt – Birth of Indian National Congress-Moderate(Gopalakrishna Gokale) Extrimists (Bank Gangadhar Tilak) and Violent fighters (Bhahavat singh,V,V,S,IYER)
6. Ruin of Indian Economy - Growth of poverty and famines In India – Alternative to British exploitation (Khadi & Village Industries) – colonial education policy and crisis in Indian education - National education movements.
7. Forerunners of ghandhi: Raja ram Mohan Roy, Dayanandha saraswadhi, Ramakrishna and Vivekananda, Ramalinga Vallalar, Raukin,Thoreau and Leo Tolstoy.
8. Contemporaies of Ghandah Tagore,jawharlal Nehru,Subas Chandra Bose, B.R Ambedkar, E,V,Ramasamy, C.Raja Gopalachari, K.Kamaraj, Khan Abdul Kaffar Khan,Jinnah, C.F.Andrews, Roman Rolland, Kasthuribai Gandhi.
9. The Global Sense: Growth of Ideas of equality, Liberty, fraternity and democracy – Growth of War, Violence, colonialism. Imperialism, totalitarianism and fundamentalism and seeking alternatives – Gandhi evolves a new way.

Books Recommended:

M.K.gandhi : An autobiographyor story to the story of my experiments with Truth. : Satyagraph in South Africas

B.R.Nanda : Mahatma Gandhi-A Biography

Louis Fisdrer: Life of Mahatma Gandhi.

DEPARTMENT OF ZOOLOGY

CERTIFICATE COURSE IN GANDHIAN THOUGHT

PAPER II – SARVODAYA AND NONVIOLENCE – 40942

PART I – SARVODAYA

1. Sarvodaya: It meaning and development significance of Antyodaya.
2. Economics Dimension: Removal of mass poverty and providing full and meaningful employment: Khadi and village industries – Appropriate Science and Technology – Self – reliance and self-sufficiency – bread labor – Simple living – Swadeshi – need based and not greed base – people oriented, Eco – friendly, Sustainable development – Decentralization – Nonviolent and Peace Economy.
3. Political Dimension: Nonviolent and good governance at all levels – Gram Swaraj: Autonomous community life and local self government –

participatory and partyless and accountability – Rights, duties and responsibilities – means and ends – Towards a Global ethic and Community.

4. Social Dimension: Individual, family, community – Liberation of the weaker sections: Uplift of women, removal of untouchability and discriminations Communal unity and pluralism – prohibition, Sanitation and hygiene.
5. Sarvodaya in Practice: Concept of Dhana (Vinoba Bhave), Jeevan Dhani and Total Revolution (Jeyaprakash Narayan), Sarvaodaya sangh and other Ghandhi Institution (K.Arunachalam and Ramachandran), ASEFA (S.Loganathan), Shanthi Sena Movement (m.Aram and N.Radhakrishnan), Gandhi Ashrams and Museums (G.Ramachandran, Soundaram, K.Muniyandi & S.Pandiyan), Environmental Movement (Sundarlal Babukuna and Metha Patkar), Struggle for Justice (S.Jaganathan & P.V.Rajagopal).

PART II – NONVIOLENCE

6. Meaning of nonviolence; Non Killing – Removing all forms of direct and indirect (Structural) violence, preventing accidents and calamities, disarmament and Nonkilling in the Non human context – Love enlightened self interest, mercy, compassion, altruism, sacrifice, forgiving, sharing reverence for all life – Love of god: Bhakti Nonviolent Action: Nonviolent Life Style construction work to build up a Nonviolent order, peaceful resolution of conflicts Nonviolent Direct Action (sathyagraha) for peace and justice Nonviolent politics and economics, etc – Nonviolent ethics and values: truth: Quest for holistic Knowledge and awareness and implementing it.
7. Contributions to Nonviolence by Mahavira, Buddha, Upanishad and Gita, Socrates, Jesuschrist, Thiruvalluvar, Prophet Mohammad, Leo tolosty, Ramalinga Vallalar, Martin Luther King, Dalailama, Aung Sung Suki, Mairead Corregan, Desmand Tutu.

8. Peaceful resolution of Conflicts: Skills for Counselling, Negotiations, Meditation and arbitration reforming the Judicial System place of Therapies, Healing Techniques and Transformation Practices.
9. Nonviolence Direct Action: Methods and Dinamics of sathyagraha Alternative Defense policy: Civilian Defense and Shanthi Sena.

Book Recommended:

M.K.Gandhi	:	Sarvodaya (Edited by Bharata Kumarappa)
Gobinath Dhavan	:	Political Philosophy of Mahatma Gandhi
Viswanath Prasad	:	Political Philosophy of Mahatma Gandhi
Varma	:	Gandhi & Sarvodaya
Jhon	:	Unto this Last
Richard B.Gregg	:	Power of Nonviolence
P.R.Diwakar	:	Sage and Satyagraha
M.K.Gandhi	:	Non-Violence in War Peace