KARNATAKA STATE OPEN UNIVERSITY

PROGRAMME GUIDE

M.Sc in Environmental Science

DEPARTMENT OF POST GRADUATE STUDIES
AND RESEARCH IN ENVIRONMENTAL SCIENCE

Mukthagangothri, Mysore – 570 006

VICE CHANCELLOR'S MESSAGE

Dear Learner,

The family of KSOU welcomes you to pursue the academic programmes you have chosen to achieve not only academic excellence but also to fulfill the desire of your career. The University, established by the Act of State Legislature has created wonderful academic ambience. The programmes offered by the University have been recognized by University Grants Commission. Therefore, the degrees are valid for employment opportunities across the country. The 'core values' of the University are derived from its vision 'Higher Education to Everyone, Everywhere'. The ultimate touchstone of quality higher education is the motto of the University. Today, higher education stands at the crossroads of keeping pace with the emerging needs of the country.

The University has adopted a school concept in its functioning. The school of science headed by a Director offers academic programmes in basic and applied sciences. It combines an inter disciplinary and professional approach to pedagogy and research. The University believes that rigors of the contemporary world require competent quality human resources to create knowledge based society. The academic activities of B.Sc. programmes are initiated through well-established department/s led by the Chairperson/s. Well-qualified teaching faculty with equally dedicated non-academic team is an asset to the University, which is always, committed for the welfare of the students.

The University functions in a 3-tier system of student support service, namely Headquarters, Regional Centres and Learners Support Centres spread all over Karnataka. The learners can undergo teaching-learning process in the notified Regional Centres/Learner Support Centres. The University has adopted a mechanism to deliver Self Learning Material by print, limited audio visual and Counseling/Personal Contact Programme. As a learner, you will have greater opportunity to gain knowledge and skill through those mechanisms. The academic counselors will play a strategic role and supports you from the enrollment of the programme till you accomplish the goal. A proper blending of the knowledge and skill will be imparted so that you will be transformed as a good citizen to contribute to the development of society and the country.

The UGC in its Public Notice dated: 23.02.2018 stated that the Degree/Diploma/Certificate Programme awarded through distance mode are at par with corresponding Degree/ Diploma/ Certificate Programme obtained through conventional universities. The degrees acquired through distance education are recognized for the purpose of employment in State/Central Government, MNCs, Private Sector etc. and also for pursuing higher education in other educational institutes. Therefore, you have greater opportunity of pursuing Higher Education without any kind of fear about your career.

I am sure you will enjoy good experience with services rendered by the university through its Regional centres and Learner Support Centres, besides Headquarters. I wish you all the best in your academic endeavors.

Prof. Vidyashankar S

MESSAGE FROM DEAN (ACADEMIC)

Dear learner,

As you know education imparts knowledge and skills which empowers all to build civilized society. Higher education policy which was once a priority sector is no longer maintaining the same, due to General Agreements and Trade in Services (GATS). The education policy of the government provides a greater opportunity to accelerate Gross Enrolment Ratio (GER).

Higher education is imparted both by conventional system and ODL system. The former education has inbuilt rigidity where ODL enjoy flexibility. Presently the GER in higher education around is 27%, thanks to the role played by ODL system. The ODL system operates under access, flexibility and success.

The Karnataka State Open University, which came up in 1996 under the Act of state legislation 1992 play a stupendous role in imparting quality education. As one of the premier institution in ODL system of the country, the university strive hard to empower various dis-advantaged sections of the society like, house wives, economically and culturally backward, tribal, senior citizens, working groups, differently abled, professionals, technocrat, jail inmates etc., The University cater to the needs of students ranging from the age of 18 years to 80 years.

The programmes offered by KSOU are strictly in conformity with quality and standards set by regulatory bodies UGC/AICTE etc., The Karnataka State Open University was established on 1st June 1996 vide Government Notification No. EDI/ UOV/ 95 dated 12th February 1996-KSOU Act 1992, keeping in view the educational needs of our country, in general, and the state in particular. The University has a long and rich experience in the field of Distance Education as the erstwhile Institute of Correspondence Course and Continuing Education. University Grants Commission (UGC) New-Delhi vide order No: F.No 14-5/2018 (DEB-I) Dated : 14th August 2018 for the period from 2018-19 to 2022-23. The KSOU operates on dictum quality first and students foremost. Further the university is highly committed to provide need based education to the door steps of the students.

The KSOU has students' support services which work in 3 tiers - head office; regional centres and study centres within the jurisdiction of state. The admissions, counseling and the examinations are conducted in different places, hence, education at the door steps.

The dedicated staffs in various department and state of the art student support services create a conducive environment for teaching learning. The university put in places all possible efforts to keep the learners happy from the stage of enrolment till they get employed. I am confident that, as a learner in the university, you will enjoy good experience in the system.

I wish you all the best in your academic endeavors.

Truly yours,

Dean (Academic)

Department of Studies and Research in Environmental Science

1. Chairman's message

Dear Learner,

The Department of Environmental Science extends a warm welcome to you to study two years M.Sc. in Environmental Science programme. The Department of Environmental Science established in 2006 and launched three certificate courses viz., Solid Waste Management, Environmental Management and Environmental Technology funded by Commonwealth of Learning, Vancouver, Canada. M.Sc. in Environmental Science programme was launched in 2011. Environmental Science as a subject has grown leaps and bounds widening its horizons and opening new frontiers of knowledge. The scope of environmental science as a subject is immense due to the conservation and wise management of resources are the need of the time in view of global environmental problems like environmental pollution, global warming, climate change, solid waste management.

M.Sc. Environmental Science programme will help in achieving the objectives of government programs like Swatch Bharath and non-government organizations programs in environmental science sector. The WTO, international relations between the countries and liberalization, privatization and globalization have created conducive atmosphere in the country to establish numerous industries. At the same time a plethora of job opportunities have been emanated for the formal graduates / post-graduates in the relevant fields that bridges the gap between "World of Knowledge and World of Work".

This program is offered in the open and distance mode so that all aspired target sections are benefited to gain knowledge, skills and attitudes in environmental science and allied disciplines. The goal of the program is to save the environment from destruction and all of its dependents from extinction. A career in environmental science is needful option and trained environmental scientists are in demand in a vast range of industries and institutes. M.Sc. Environmental Science provides job opportunities in industries, ministries, judiciary, research organizations, universities, colleges, multinational companies, administration and NGOs, etc. Present Program is designed to meet the national and international requirements of environmental monitoring, management, environmental impact assessment, ISO certification,

environmental legislations, hazards, risk management, air/water/soil pollution management, nano-science application, biodiversity conservation, natural resource management, energy resource conservation, recycling of waste materials, social issues of the environment, environmental protection and policies for sustainable development of the society.

The university has a state of art library; you are advised to avail the facility to enrich your knowledge. The department has made a very sincere effort to give you exhaustive study material wherever required in order to augment to advise a certain suggested reading. I am confident that the end of the two years, you will feel that you an asset in the society, as you acquire requisite skills, knowledge and attitude. The faculty members of the department wish you all the very best.

Dr.J.S. Chandrashekar
Chairman
Department of Studies and
Research in Environmental Science

2. About the Department

Introduction

The Department of Studies in Environmental Science is established in 2006 and launched three certificate courses viz., Solid Waste Management, Environmental Management and Environmental Technology funded by Commonwealth of Learning, Vancouver, Canada. The Department launched M.Sc. in Environmental Science programme in 2011. The department industry interface bridges the gap between the expectations and the reality in so far as knowledge and skills. The illustrious academicians with magnificent treasury of knowledge have tailored the programmes in the department. The faculty members who have acquired the skill in respect of contemporary issues have contribute their mite to make the programme highly meaningful in the competitive arena.

The **Department of Environmental Science** comes under the ambit of **School of Sciences**. The various programmes offered by the Department include M.Sc. in Environmental Science.

Vision:

To develop knowledge of Environmental Science among learners through innovative, engaged and relevant teaching thereby transforming individuals and communities.

Mission:

- To impart the knowledge and skill to the learners and thereby increase his/her professionalism.
- To create effective human resources by employing the Information, Communication and Technology.
- To enhance the capacity of the learners to realize their individual, corporate and social responsibility.
- To train the learners though Information and Communication Technology
- To impart education such that the learner inculcates moral, civil and ethical values.
- To provide education to embrace the philosophy of learn, earn and return.
- To provide education at affordable cost to the masses.

Faculty Details

a. Department of Environmental Science

Sl. No.	Name of the Faculty	Designation	Qualification	Specialization	Experience in Years	Mobile Number
1	Dr. J.S.Chandrashekar	Assistant Professor & Chairperson	M.Sc. M.Phil Ph.D.	Ecology	10	9663061978
2	Dr. T. S. Harsha	Assistant Professor	M.Sc. Ph.D.	Environmental Microbiology	14	550
3	Dr. H.R. Meena Kumari	Assistant Professor (Contract Basis)				
4	Dr. Priyadarshini N.R	Assistant Professor (Contract Basis)				
5	Dr. Gireesha .J	Assistant Professor (Contract Basis)				

3. **Programmes offered:** M.Sc. in Environmental Science

4. **Objectives**

- To provide professional skills to the learners in the key areas of in environmental science.
- To ensure wide access to the learners' knowledge and understand scientific processes of environmental science to tackle local and global environmental issues.
- To enable innovative and transformative research in environmental sciences.
- To tackle environmental issues like global warming, climate change, solid waste management etc. with multidimensional approach.
- To fulfil the objectives of government programs like Swatch Bharath.
- To train learners with latest knowledge, skills and attitude to become experts in the field of environmental science and to get employment.

5. **Programme details**

5.1 Syllabus along with paper code, title of the course and credits: Annexure-I

5.2 Detail Syllabus (Block and Unit wise): Annexure-II

5.3 Duration of the course: Two years (Four semesters)

5.4 Medium of Instruction: Medium of Instruction is English.

5.5 Mode of Instruction: Print material, E-content, PCP/Counseling.

6. **Any other information:** - Nil-

M.Sc. Environmental Science (CBCS mode)

Sem	Course Code	Course Title	Credits	Counseling/PCP Hours	Max. Marks			Minimum Passing marks		Duration of Exam (hours)
					Internal Assessment	Term end exam	Total Marks	Internal Assessment	Term end exam	
I Semester	ESHC 1.1	Fundamentals of Environmental Science	4	12	20	80	100	08	32	3
	ESHC 1.2	Environmental Chemistry	4	12	20	80	100	08	32	3
	ESHC 1.3	Practical I	4	120	20	80	100	08	32	3
	ESSC 1.1	Environmental Geology	3	09	20	80	100	08	32	3
	ESSC 1.2	Surface & Groundwater Hydrology	3	09	20	80	100	08	32	3
	ESSC 1.3	Environmental Microbiology	3	09	20	80	100	08	32	3
	ESSC 1.4	Environmental Toxicology	3	09	20	80	100	08	32	3
	ESOEL-1	Basics of Environmental Science	2	06	10	40	50	04	16	$1^{1/2}$
		Total	20	168	110	440	550	44	176	-
II Semester										
	ESHC 2.1	Solid Waste Management	4	12	20	80	100	08	32	3
	ESHC 2.2	Environmental Pollution and its	4	12	20	80	100	08	32	3
	ESHC 2.3	Practical II	4	120	20	80	100	08	32	3
	ESSC 2.1	Environmental Laws and Legislations in India	3	09	20	80	100	08	32	3
	ESSC 2.2	Environmental Management Systems and Life Cycle Analysis	3	09	20	80	100	08	32	3
	ESSC 2.3	Wildlife Management	3	09	20	80	100	08	32	3
	ESSC 2.4	Marine and Wetland Ecosystem Management	3	09	20	80	100	08	32	3
	ESOEL-2	Advances in Environmental Science	2	06	10	40	50	04	16	$1^{1/2}$
			20	168	110	440	550	44	176	-

Sem	Course Code	Course Title	Credits	Counseling/PCP Hours	Max. Marks			Minimum Passing marks		tion of Exam (hours)
					Internal Assessment	Term end exam	Total Marks	Internal Assessment	Term end exam	
III Semester	ESHC 3.1	Water and Wastewater Treatment	4	12	20	80	100	08	32	3
	ESHC 3.2	Environmental Impact Assessment	4	12	20	80	100	08	32	3
	ESHC 3.3	Practical III	4	120	20	80	100	08	32	3
	ESSC 3.1	Remote Sensing and GIS	3	09	20	80	100	08	32	3
	ESSC 3.2	Environmental Statistics and Computer Applications	3	09	20	80	100	08	32	3
	ESSC 3.3	Occupational Safety and Health	3	09	20	80	100	08	32	3
	ESSC 3.4	Industrial Safety and Disaster Management	3	09	20	80	100	08	32	3
	ESSEC-T	Environmental Auditing - Theory	2	06	10	40	50	04	16	$1^{1/2}$
		Total	20	168	110	440	550	44	176	-
IV Semester										
	ESHC 4.1	Biodiversity and Conservation	4	12	20	80	100	08	32	3
	ESHC 4.2	Dissertation	8	240	50	150	200	20	60	3
	ESSC 4.1	Environmental Biotechnology	3	09	20	80	100	08	32	3
	ESSC 4.2	Bioremediation	3	09	20	80	100	08	32	3
	ESSC 4.3	Environmental Economics and Sustainable Development	3	09	20	80	100	08	32	3
	ESSC 4.4	Climate Change and Green Technology	3	09	20	80	100	08	32	3
	ESSEC-P	Environmental Auditing - Practical	2	06	10	40	50	04	16	$1^{1/2}$
		Total	20	276	120	430	550	48	172	-
		Grand Total	80	780	450	1750	2200	180	700	

Interdisciplinary Electives

SL No	Department	Sub Code	I Semester	Sub Code	II Semester
1	KANNADA	ELK-01	ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಇತಿಹಾಸ	ELK-02	ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಇತಿಹಾಸ
2	ENGLISH	ELE-01	Indian Literature -I	ELE-02	Indian Literature -II
3	HINDI	ELH-01	Vyavaharik Hindi Vyakaran	ELH-02	Hindi Cinema
4	TELUGU	ELT-01	Tilak	ELT-02	Telugu Samskruthi – Samaajam
5	HISTORY	ELHS-01	Ancient World Civilisations (Egypt, Mesopotamia, Greek, Roman, Inca, Chinese)	ELHS-02	Social Reform Movement in India
6	ECONOMICS	ELEC-01	Economic Policies of India Since 1991	ELEC-02	Institutions for International Development
7	POLITICAL SCIENCE	ELP-01	Local Government in India.	ELP-02	Indian Constitution
8	PUBLIC ADMINISTRATION	ELPA-01	Indian Polity-1	ELPA-02	Indian Polity-2
9	SOCIOLOGY	ELS-01	Invitation to Sociology	ELS-02	Study of Indian Society
10	JOURNALISM AND MASS COMMUNICATION	ELJ-01	Aspects of Journalism and Mass Communication - I	ELJ-02	Aspects of Journalism and Mass Communication - II
11	ANCIENT HISTORY AND ARCHEOLOGY	ELA-01	World heritage sites of India	ELA-02	Cultural History of Hoysalas
12	EDUCATION	ELED-01	Foundations of Education	ELED-02	Higher Education
13	COMMERCE	ELC –01	Personal Financial Planning	ELC –02	Entrepreneurship Development
14	MANAGEMENT	ELM –01	Disaster Management	ELM –02	E-Commerce
15	BIOCHEMISTRY	ELMBC –01	Basics of Bioinorganic and Biophysical chemistry for Biology graduates.	ELMBC –02	Basic Bioorganic chemistry for Biology graduates.
16	BIOTECHNOLOGY	ELMBT –01	Biotechnology Principles and	ELMBT –02	Fundamentals of Biotechnology

			applications		
17	CHEMISTRY	ELMC –01	Open Elective I	ELMC –02	Open Elective II
18	CLINICAL NUTRITION AND DIETETICS	ELMCND –01	Healthy lifestyles and nutrition	ELMCND–02	Nutraceuticals and health foods
19	COMPUTER SCIENCE	ELMCS –01	Mobile App Development	ELMCS –02	E-Commerce
20	ENVIRONMENTAL SCIENCE	ELMES –01	Basics of Environmental Science	ELMES –02	Advances in Environmental Science
21	GEOGRAPHY	ELMG –01	Introduction to Physical Geography	ELMG –02	Geography of Karnataka
22	MATHEMATICS	ELMM –01	Fundamentals of Mathematics	ELMM –02	Combinatorics and Graph Theory
23	MICROBIOLOGY	ELMMB –01	Microbial World and Microbial Diversity	ELMMB –02	Microbes in Sustainable Agriculture and Development
24	PHYSICS	ELMP –01	Mechanics	ELMP –02	Waves and Optics
25	PSYCHOLOGY	ELMPSY –01	Introduction to Psychology	ELMPSY –02	Psychology in Everyday Life
26	INFORMATION TECHNOLOGY	ELMIT –01	Green Computing	ELMIT –02	E-Commerce
27	BOTANY (NEW)	ELMBOT –01	Plant-Microbe Interactions	ELMBOT – 02	Plant Diversity and Human Welfare
28	ZOOLOGY (NEW)	ELMZ –01	Parasites Vectors & communicable diseases	ELMZ–02	Essential of Reproductive Health
29	FOOD AND NUTRITION SCIENCES	ELMFNS –01	Food Psychology	ELMFNS –02	Nutritional Management in Disaster Conditions

Note:

A. I and II Semester Open elective (Interdisciplinary Electives) syllabus are attached in Annexure – I and Annexure - II respectively.

B. The Students may contact respective department chairperson in case of any queries regarding open elective course. The contact details available in the university website.

Detailed Syllabus for M.Sc. in Environmental Science

I Semester

ESHC 1.1: Fundamentals of Environmental Science

Block I: Introduction to Environmental Science

Unit 1: Introduction to Environmental Science: Definition, General Perspectives; multidisciplinary facets of environment. Principles and Scope of Environmental Science. Evolution of environment. Earth's Atmosphere - Troposphere, stratosphere, mesospehere; thermosphere; ionosphere; Energy transfer in atmosphere; radiation; conduction; convection.

Unit 2: Hydrosphere: Importance of water; distribution and sources; properties of water; water budget; consumption use of water; water cycle; water pollution – point and non-point sources.

Unit 3: Lithosphere: Internal structure of earth – crust, mantle, core. Minerals – sources and types. Rocks – types; rock cycle. Soil – formation, classification criteria and types, soil profile.

Unit 4: Biosphere: Components of biosphere; Biome and aquatic life zones; interacting components of natural and social environment.

Block II: Environmental Disturbances

Unit 5: Environmental Disturbances: Natural disasters – volcanoes, earthquakes, floods, fires, erosion. Manmade disturbances – air, water, soil and sound pollution. Monitoring and management of natural disasters.

Unit 6: Human Ecology and Environment: Introduction, definition of human ecology, disciplines associated with human ecology; human interaction with the environment; environmental ethics.

Unit 7: Drivers of Environmental Changes: Introduction, Primary (historical) drivers of environmental changes; population increase; technological innovation; explosion in energy use and economic integration;

Unit 8: Drivers of environmental degradation: Population explosion; affluence; technology; poverty; market structure; policy and political failure; economic growth; forces of globalization.

Block III. Ecosystem Dynamics

Unit 9: Ecosystems: Definition, biotic and abiotic factors; Producers, consumers and detritivores. food chain, foodweb; trophic levels. Aquatic (lentic, lotic and all other wetlands), aerial and terrestrial ecosystems (forest, grassland and estuary ecosystems). Matter and energy flow in ecosystems. Ecological pyramids – numbers, energy, biomass.

Unit 10: Factors affecting Ecosystems: Homeostasis, Limiting factors, Liebig's law of minimum, Shelford's law of Tolerance. First and second law of thermodynamics and its application.

Unit 11: Ecotone: Definition, habitat, Ecological Niche, Edge effect, Ecotype, Ecophene and Ecological indicators.

Unit No. Ecological succession – primary and secondary; hydrosere, xerosere, psammosere. succession process. Climax concept.

Unit 12: Population dynamics: Definition, structure, population density, Natality, Mortality, immigration, emigration. Growth pattern and growth models. Fluctuation and equilibrium, Biotic potential, population dispersion – various influencing factors.

Block IV. Ecological Resources

Unit 13: Energy Resources: Introduction, Classification, Renewable and Nonrenewable sources, Importance of Renewable and Nonrenewable sources.

Unit 14: Forest Resources: Introduction, types of forests – natural, engineered forest ecosystem. Effect of Deforestation.

Unit 15: Water Resources: Introduction, Distribution of water in earth. Types – freshwater - surface and GW; marine, estuarine and wetlands.

References

Bill Freedman, 1995. Environmental Ecology: The Ecological effects of pollution, disturbance and other stresses. Adademic Press, London.

J.S. Singh, S.P. Singh and S.R. Gupta, 2014. Ecology, Environmental Science and Conservation. S. Chand and Co. Ltd., New Delhi.

P. D. Sharma, 2012. Ecology and Environment. Rastogi Publications.

SC Santra, 2011. Environmental Science, NCBA publication, New Delhi.

General Ecology – Kumar H.D et. al, Vikas publishing house Pvt. Ltd. New Delhi (1995)

Fundamental Ecology, Odum E.P.III Ed, Saunders, (1971)

Ecology – Culvinvux P, John Wiley and Sons, (1986)

Ecology and Environment – P.D.Sharma, Rastogi Publications, Meerut India

Ecology – Krebs J, II ed, Harper international

The Ecology of Tropical lakes and Rivers Payne A.I. John Wiley (1986)

Concepts of Ecology – Kormondy-Prentice Hall

Cell biology and evolution. P.S.Verma and Agarwal I ed. Chand and company, New Delhi (1974)

ESHC 1.2: Environmental Chemistry

Block -1 Fundamentals of Environmental Chemistry

Unit 1: **Introduction to Environmental Chemistry**: Scope and Importance, Stoichiometry, Gibb's energy, chemical potential, acid-base reactions.

Unit 2: **Chemical Kinetics:** Reaction kinetics. Electrochemistry and its applications. Types of reactions. Chemical equilibrium**:** Physical and chemical equilibrium – fundamentals and applications.

Unit 3: Chemical composition of air: Chemical Composition of atmospheric air, photochemical reactions, Composition and specific reactions of gases in troposphere and stratosphere, Primary and secondary pollutants/contaminants of air.

Unit 4: Chemical composition of water and soil: Elemental composition of earth and water. Composition of soil – acidic, sodic and alkaline; natural and contaminated soils. Composition of water and wastewater. Pollutants/contaminants in soil and water.

Block –II Environmental chemistry

Unit 5: **Chemistry of air, water and soil**. General chemistry of environmental attributes.

Unit 6: Environmental pollutants: Pollution specific parameters pertaining to water, wastewater and sludge. Estimation of grouped qualitative parameters colour, DO. Solids, BOD, COD, POC TOC, Nitrogen and Phosphorus. DOM and NOM.

Unit 7: Biogeochemical cycles: C, H, N, O, P, S cycles and their importance, sources and sinks.

Unit 8: **Chemistry of hazardous materials** – definition, classification, chemical interactions with soil and water environment. Reaction between various chemicals in waste and components of water/soil.

Block – III Colloidal chemistry, Colorimetry and Analytical Chemistry Applications

Unit 9: Colloidal Chemistry: Properties of colloids, colloidal dispersions, stability of Colloids.

Unit 10: Environmental applications of colloids: Removal of colloidal particles from contaminated water/waste stream.

Unit 11: Colorimetry: Introduction, Principles, Laws and applications - Lambert's and Beer's law.

Unit 12: Analytical Chemistry Applications: Applications of Analytical Chemistry – emission and absorption techniques.

Block – IV Instrumental methods

Unit 13: Analytical methods – Gravimetry, Titrimetry, colorimetry, fluorimetry and spectrometry.

Unit 14: Electrical methods: Principles and applications in potentiometry and conductometry.

Unit 15: Chromatographic methods: Principles and applications of GC and GCMS

Unit 16: Other instrumental methods: Principles and applications of Spectrometry, HPLC and Electrophoresis. EDS, FTIR, UV-VIS and IR Spectrophotometer, ICP-MS, AAS, Flame Photometer and Ionmeter. XRD. Microscopy- SEM, TEM, TGA, AFM.

References

Stanley Manahan, 2017. Environmental Chemistry. Tenth Edition, CRC Press, New Delhi.

Gary W. and Duffy Stephen J. Amazon.com: Environmental Chemistry: A global perspective. Oxford Publications.

A K De, 2018. Environmental Chemistry. New Age International Publisher, New Delhi

Gilbert M. Masters, 2015. Introduction to Environmental Engineering and Science. Pearson Publication, USA.

Sayer and McCarty..

Vogels …

ESHC 1.3: Practical I - Environmental Chemistry and Ecology & Environment 1.1

1. Water sampling

Identification of phytoplankton and zoo plankton

HC 1.3A Environmental Chemistry

Experiment No. 1: Sampling Techniques water and soil for physical, chemical and biological purpose

Experiment No. 2: Study of Water Quality Parameters - physical, chemical and biological

Experiment No. 3: Determination of Physical Parameters (Temperature, Colour, Odour, pH, Conductivity, Turbidity, etc.,)

Experiment No. 4: Determination of Chemical Parameters (DO, BOD, COD, CO_2 Phosphate, Alkalinity, Acidity, Hardness).

Experiment No. 5: Plankton Study

Experiment No. 6: Identification of Indicator Species (Phytoplankton & Zooplankton)

HC 1.3B:

Experiment No. 1: Study of plant community structure in a grassland ecosystem (Frequency, Density and Abundance).

Experiment No. 2: Study of Primary Production in a grassland ecosystem

Experiment No. 3: Study of tree community structure of a Forest Ecosystem (Frequency, Density and Abundance)

Experiment No. 4: Study of Relative Dominance in Forest Ecosystem.

Experiment No. 5: IUCN Red List of Threatened Species

Experiment No. 6: Study of National Parks of Karnataka

Experiment No. 7: Study of Wildlife Sanctuaries of Karnataka

ESSC 1.1: Environmental Geology

Block I: Environmental Geology

Unit 1: **Environmental Geology:** Definition, scope, sub disciplines and importance.

Unit 2: **Earth in the Solar system:** Earth in the solar system, origin and evolution of the earth, size, shape, mass, density and rotational parameters.

Unit 3: **Internal structure of Earth:** Constitution of the earth, core, mantle and crust; Convections in the earth's core and production of magnetic field; Composition of earth in comparison to other bodies in the solar system. Endogenic and Exogenic earth's processes, Concept of residential time.

Unit-4: Origin of Earth's layers: Origin of hydrosphere and atmosphere, biosphere; Origin of oceans, continents and mountains - orogenesis, Age of the earth; Radioactivity and its application in determining the age of the earth. Major events in the earth's history in geological timescale.

Block II: Geological Hazards

Unit 5: Earthquakes and Volcanoes: Earthquakes - Causes, geological effects and their measurement, distribution of earthquake belts; Volcanoes - Types, causes and geological effects, distribution of volcanic belts; Relationship of earthquakes with volcanic belts.

Unit 6: Plate tectonics: Plates and their margins, constructive margin, destructive margin, continental plate boundaries, ocean plate boundaries, causes of movement of the plates, paleo magnetism, seafloor spreading and hotspots. Geological features of India and Karnataka

Unit 7: Geological Hazards: Geological hazards and basic concepts of disaster management, Mitigation, Preparedness and emergency response activities.

Unit 8: Soils: Soil formation, soil profile, Weathering and erosion, soil management.

Block III: Rocks

Unit 9: Rocks: Definition, rock types, rock cycle, importance of rock cycle. Rocks types and water quality.

Unit 10: Igneous rocks – Forms**,** Extrusive and Intrusive; Concordant, discordant, Structures;

Unit 11: Sedimentary rocks - Weathering, transportation, lithification and diagenesis. Classification based on mode of formation- residual, mechanical, chemical and organic. Classification based on grain size - rudaceous, arenaceous, argillaceous. Depositional environment - terrestrial, laccustrine, fluvial and marine.

Unit 12: Metamorphic rocks – Agents of metamorphism, kinds of metamorphism–Contact (thermal), Regional (dynamothermal) and its grades, dynamic (cataclastic), plutonic, pneumatolytic. Structures -gneissose, schistose, granulose. Effects of thermal metamorphism on argillaceous sediments and calcareous sediments. Effects of regional metamorphism on argillaceous sediments and basic igneous rocks.

Block IV: Minerals and Applications of Environmental Geology

Unit-10: Minerals: Introduction, definition of mineral, history of mineralogy, branches of mineralogy. Physical mineralogy: Characters depending upon the state of aggregation, habit and form. Characteristics depending upon cohesion and elasticity: cleavage, fracture, hardness, tenacity.

Unit 14: Geochemical cycles of minerals: dispersion patterns, Geochemical anomalies-natural and anthropogenic. Use of minerals in water reclamation and soil remediation.

Unit 15: Geochemical factors influencing environmental health, properties of geological environment, geological energy potential.

Unit 16: Impacts of imbalance on important trace elements - Possible effects from geological elements, fundamental properties of geological environment. Isotopic applications in geochemical elements.

References

Dorothy Merritts, Kirsten Menking, Andrew DeWet, 2014. Environmental Geology - An Earth Systems Approach. H.E. Freeman Publications, London

Jon Erickson, Environmental Geology – Facing the Challenges of our Earth. Facts on File, Inc., New York.

Carla W. Montgomery · 1997. Environmental Geology. McGraw-Hill Higher Education, London.

Roy H. Williams, 2012. Earth Science – New Methods and Studies. Apple Academic Press, New York.

K.S. Valdiya, 2013. Environmental Geology – Ecology, Resource and Hazard Management. 2nd Edition. McGraw Hill Education (India) Private Limited, New Delhi.

Catherine Vanessa Anne Duke, Craig Denver Williams · 2007. Chemistry for Environmental and Earth Sciences. CRC Press, London.

ESSC 1.2: Surface and Groundwater Hydrology

Block I: Hydrology, Sources of water and its Characteristics.

Unit 1: Introduction to Hydrology, Development of hydrology, sources of water, hydrosphere, physical properties of water.

Unit 2: Distribution of water on earth: Introduction, various types of water demands, per capita demand, factors affecting on the water demand, variations in demand, design period, Total requirement of water for a region, population forecasting methods and simple problems.

Unit 3: Hydrological Cycle: water sources on the earth, water vapour, transpiration, cloud formation and seeding for artificial rain – various forms of rain- storms and rainfall. Energy associated with hydrologic cycle, oceanic thermal circulation, human influences on the changes in the rainfall, rain gauges, remote sensing to assess precipitation, intensity, prediction of rainfall and pattern.

Unit 4: Characteristics of water in various catchments: Characteristics of rainwater, groundwater, river water and sea water.

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Block II: Groundwater Hydrology

Unit 5: Groundwater: Introduction, occurrence of groundwater, the groundwater system.

Unit 6: Aquifers: Introduction, confined and unconfined, springs, Aquitard, the water table. Causes for groundwater depletion and recharge options. Permeable pavements for flood prevention and storage.

Unit 7: Groundwater flow: Introduction. Groundwater function, movement and topography. Use of tracers for groundwater movement and pollution studies.

Unit 8: Groundwater problems: Groundwater quality, groundwater pollution, saltwater intrusion, changes in ground water quality.

Block III: Water Management and River System

Unit 9: Watershed management: Best Management Practices.

Unit 10: Rain Water harvesting: Definition of rainwater harvesting, types of harvesting. Kinds of storage, benefits of rainwater harvesting.

Unit 11: Lentic and Lotic systems of India: Major lentic systems of urban India. Importance of natural drainage systems, urban drainage and its management. Deccan Plateau and Himalayan River systems. River continuum concept. Environmental factors influencing the water quality.

Unit 12: Water crisis management: Water requirement and availability for several uses. Water shortages in urban areas, Water crisis management, Policy and legal framework, Institutional framework.

Block IV: Integrated Water Resource Management

Unit 13: Water as a global issue: key challenges and needs – concept of Integrated water resources management (IWRM) within the broader context of development – Complexity of the IWRM process – Examining the key elements of IWRM process.

Unit 14: Economic view of water issues: economic characteristics of water good and services, Non-market monetary valuation methods, Water economic instruments, policy options for water conservation and sustainable use: Case studies. Pricing: distinction between values and charges – Private sector involvement in water resources management (PPP): objectives, options, processes, experiences through case studies, Links between PPP and IWRM. Water budget.

Unit 15: Water for food production: 'blue' versus 'green' water debate, Virtual water trade for achieving global water security, Irrigation efficiencies, irrigation methods and current water pricing. Irrigation: Water User's Association, Types and Levels of Operation and Organization in irrigation System, User roles in irrigation Management, Role of Community Organizer, The context of Participation.

Unit 16: Water Legal and Regulatory Settings: Basic notion of law and governance: principles of international and national law in the area of water management. River water disputes, Integrated river basin development.

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Thomas C. Winter, Geological Survey (U.S.), Judson William Harvey 1998. Ground Water and Surface Water: A Single Resource. US Geological Survey.

K.R. Ruston, 2003. Groundwater Hydrology – Conceptual and Computational Models. John Wiley and Sons Ltd., England.

Larry W. Mays, Mays · 2011. Ground and Surface Water Hydrology. Wiley Global Education, England.Water Resource Engineering (2nd Edition) (2011): Larry W.Mays, John Wiley and Sons, Inc.

Water Resources (2010): Shimon C Anisfeld, Island Press.

Water resource Engineering: Principle & Practice (2009): Satya N Challa Murthy, New Age International Publisher.

Principles of Water Resources: History, Development, Management, and Policy (3rd Edition) (2010): Thomas V Cech, John Wiley and Sons, Inc.

Hydrology & Water Resource Engineeering (2014): S. K. Garg, Khanna Publishers, Delhi

Water Supply Engineering, Vol.1 (25th Edition) (2014): S. K. Garg, Khanna Publishers, Delhi

Engineering Hydrology (2nd Edition) (2008): Jayaram Reddy, Laxmi publications Pvt. Ltd., New Delhi

Hydrology and Water Resource Engineering (5th Edition) (2000): R.K.Sharma & T.K. Sharma, Dhanapati Rai Publications.

Engineering Hydrology (3rd Edition) (2008): K Subramanya, Tata Mc GrawHill Publishing Company Ltd., New Delhi.

Weber. W.J, Ann Arbor 1974. Physico – Chemical Process for Water quality (1st Edition), John Wiley and Sons, Inc.

Applied Ground Water Hydrology and Well Hydraullics (2nd Edition) (2001): Michael Kasenow, Water Resource Publication, LLC.

Groundwater (1979) : Freeze, R.A. & Cherry, J., Prentice Hall Inc.

Analysis & Evaluation of Pumping Test Data (1991): Kruseman, G.P. and Deridder, N.A., ILRIPublication No. 47, The Netherlands.

Groundwater Hydrology (1980): Todd, D.K, John Wiley and Sons, Inc.

Water resource System (1st Edition) (2013): Sanjay Gupta, Vayu Education of India.

ESSC 1.3: Environmental Microbiology

Block I: Microorganisms in the environment

Unit 1: Introduction to Environmental Microbiology - Microbes in terrestrial (soil), aquatic, atmospheric and biological environments.

Unit 2: Microbes in Extreme Environment - Microbes of extreme environments, thermophiles, acidophiles, alkaliphiles, halophiles, barophiles and their significance.

Unit 3: Need for Microbiological studies - Microbial flora and fauna concern to Environmental scientists and engineers

Unit 4: Microbiology of Air - Significance of airspora, factors affecting airspora, Techniques of trapping air borne microorganisms.

Block II: Role of microorganisms in the environment

Unit 5: Water pollution - Sources, pollutants, ecological effects of pollution, microbes as biological indicators of water pollution.

Unit 6: Water borne diseases - Causes and remedies, testing techniques – plate count, MPN and MTFT - significance of each tests. Testing for coliform bacteria - Total coliform and *E. coli*; virus enumeration methods as applied for drinking water.

Unit 7: Waste water treatment - Domestic sewage and industrial effluents treatment.

Unit 8: Problems caused by microalgae and its control.

Block III: Significance of microbial activities in the environment - 1

Unit 9: Soil Microbiology - Interactions between microorganisms and their significance - Mutualism, commensalism, ammensalism, synergism, parasitism, predation, competition; Role of microorganism in carbon, nitrogen, phosphorous and sulphur cycles.

Unit 10: Composting - Fundamentals of composting process; composting technologies and their applications; Biogas production.

Unit 11: Bioconcentration and biomagnification and their effects.

Unit 12: Bioremediation - Concept, principal and mechanism of bioremediation - acclimatization, detoxification, transformation, degradation, mineralization, co-metaboilsm, metabolism, biostimulation, bioaugmentation.

Block IV: Significance of microbial activities in the environment - 2

Unit 13: *In situ* and *Ex situ* bioremediation technology; bioventing and biosparging; Factors affecting bioremediation; Restoration of ground water and oil spills.

Unit 14: Microbial degradation of pesticides and xenobiotics.

Unit 15: Bioleaching - Microbes in metal extraction; Removal of heavy metals from effluents.

Unit 16: Biofuel production - Types of biofuels; Microorganisms in biofuel production; Biofuel production process**;** Microbial fuel cells.

References

1. Agashe SN. Recent Trends in Aerobiology, Allergy and Immunology. Oxford and IBH pub. New Delhi.
2. Atlas RM and Bartha R. Microbial ecology - Fundamentals and Applications. Addison Wesley Longman (Pearson Education)
3. Atlas RM and Philp CJ (Eds). Bioremediation: Applied microbial solutions for real-world environmental cleanup. AMS Press.
4. Buckley RG. Environmental Microbiology. CBS Publishers & Distributors.
5. Dubey RC and Maheshwari WK. A Text book of Microbiology. S. Chand and Co. New Delhi.
6. Lesinger T. *et al.* Microbial degradation of xenobiotic and recalcitrant compounds. Academic Pres, New York.
7. Maria Csuros and Csaba Csuros. Microbiological examination of water and wastewater. CRC Press, Boca Raton.
8. Mohapathra, P.K. 2008. Text book of Environmental Microbiology. I.K. International Publishing House, New Delhi.
9. Nijaguna BT. Biogas technology. New Age Publication.
10. Patrick K. Jemba. Environmental Microbiology. Principles and Applications. Science publisher.
11. Raina M. Maier, Ian L. Pepper, Charles P. Gerba. Environmental Microbiology. Academic Press.
12. Ravi V. Durvasula and Subba Rao DV (Eds.). Extremophiles From Biology to Biotechnology. CRC Press.
13. Sharma PD. Environmental Microbiology. CBS Publishers & Distributors.
14. Shree N. Singh and Rudra D. Tripathi. Environmental bioremediation technologies. Springer

ESSC 1.4: Environmental Toxicology

Block — I

Unit 1: Introduction: Definition of toxicology and ecotoxicology; Scope; Historic and current need for ecotoxicology-Early history of toxicology/contamination of toxins and toxicants

Unit 2: Ecotoxicology-A Synthetic Science; Scope and basic division of eco-toxicology.

Unit 3: Basic concept of ecotoxicology: Ecologic principles and theory of chemical interactions with individuals, populations, communities, and ecosystems; Environmental toxicant and toxicity; environmental concentration of toxicants**.**

Unit 4: Movement of toxicant in ecosystem: Fate and exposure; single phase chemical behavior; transport of chemical in air, water, and soil; chemical transport between phases; chemical behavior and bioavailability.

Block — II

Unit 5: Basic Ecological problems of ecotoxicology: Relationship of linkages between responses at different ecological organization level; over time; over the property of toxicant/chemical; over the increasing organization level. General influence of toxicants on structural and functional characteristics of various levels of biological system of an ecosystem.

Unit 6: General aspects of fate and effects: Media and compartments; ecosystem types and toxicant entry pathways. Exposure; environmental fate of toxicants; bioavailability. Toxic effects: types of effects.

Unit 7. Uptake, Biotransformation, Detoxification, Elimination and Accumulation: Uptake of toxicants; biological magnification: Bio-concentration, Bioaccumulations and biotransformation. Detoxification process and accumulation.

Unit 8. Bioaccumulation of pesticides in aquatic and terrestrial organisms: Invertebrates, livestock and poultry, birds and human beings- milk, adipose tissue, blood, factors affecting the bioaccumulations. Various methods employed to measure bioaccumulation.

Block — III

Unit 9. Environmental contaminants: Definition. Sources- natural and anthropogenic. General chemical properties of contaminants; Background Chemistry and toxicity of persistent bio accumulative and Toxic compounds (PBT).

Unit 10. Classification of Environmental contaminants: Heavy metals (Eg. Pb, Cd, Hg etc.,); Persistent Bio-accumulative and Toxicants (Pesticides; dioxin and furans; flame retardants; Polychlorinated hydrocarbons; PCBs; PAH; Organotins) Radionuclides and trace elements — Classification criteria and types.

Unit 11. Acute and chronic toxicity. Definition. Factors influencing the toxicity: duration; dose and dosage, dose response relationships, interactions of toxicants, statistical concept of toxicity; margin of safety, toxicity curves.

Unit 12. Biochemical toxicology- Organic toxicant Detoxification, Biomarkers; Metallothionein, Stress Proteins, Oxidative Stress and Antioxidant Response, DNA Modification, Enzyme Dysfunction and Substrate Pool Shifts.

Block — IV

Unit 13. Toxicity measurement: Introduction, definitions on measurement parameters: physico-chemical parameters; fate parameters; effect parameters. Introduction to assessment of end point of toxicity at individual, population, community, and ecosystem levels.

Unit 14. Physico-chemical and Fate parameters: ionization (pK_a); Henry`s law constant (H_c); Vapour pressure, water solubility; Soil/water partition coefficient, Octonol /water coefficient, Oxidation rate. **Fate parameters:** persistence, mobility.

Unit 15. Biological parameters: Acute and chronic parameters of growth, development and reproduction. Biochemical, physiological, behavioural effects of a few toxicants like pesticides and heavy metals.

Unit 16. Statistical Evaluation of tests: Determination of lethal concentration/dose and EC values. Determination of NOEC or LOEC values. Brief account on biological parameters at system level, population, and community level. Structural and functional parameters of toxicity at ecosystem level. Tired procedures for fate and effect tests.

References:

1. Hodgson, E. 2004. Textbook of Modern Toxicology. John Wiley & Sons, Inc. New Jersy.
2. Klaassen, C. D. 2001. Ecotoxicology. 6th ed. McGraw Hill Publishing. Toronto.
3. Moriarty, F. 1999. Ecotoxicology, 3rd ed. Elsevier Pub
4. Peter Calow, 1993. Handbook of ecotoxicology, Blackwell Science, London
5. Williams, P.L., James, R.C. and Roberts, S. M. 2000. Principles of Toxicology-Environmental and Industrial applications. 2nd Ed. John Wiley & Sons, Inc.
6. Römbke, J and J.F. Moltmann 1996. Applied Ecotoxicology. CRC-Lewis Publisher

Annexure I

INTER- DISCIPLINARY COURSE
(Open Elective) for First Semester

ವಿಭಾಗ– ಕನ್ನಡ

ಪತ್ರಿಕೆ–೬: ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಇತಿಹಾಸ EL 1.1 (ಕ್ರೆಡಿಟ್–೩)

ಬ್ಲಾಕ್–೧೯: ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಮುಖ್ಯ ಘಟ್ಟಗಳು

ಘಟಕ–೭೩: ಆಧುನಿಕ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಹಿನ್ನೆಲೆ ಮತ್ತು ಪ್ರೇರಣೆಗಳು.

ಘಟಕ–೭೪: ನವೋದಯ ಪೂರ್ವ, ನವೋದಯ– ಬಿ.ಎಂ.ಶ್ರೀ., ಕುವೆಂಪು, ದ.ರಾ.ಬೇಂದ್ರೆ, ಶಿವರಾಮಕಾರಂತ, ಮಾಸ್ತಿವೆಂಕಟೇಶ್ ಅಯ್ಯಂಗಾರ್, ಕೆ.ಎಸ್. ನರಸಿಂಹಸ್ವಾಮಿ.

ಘಟಕ–೭೫: ಪ್ರಗತಿಶೀಲ ಮತ್ತು ನವ್ಯ: ಅನಕೃ, ಕಟ್ಟೀಮನಿ, ನಿರಂಜನ, ಚದುರಂಗ, ವಿ.ಕೃ. ಗೋಕಾಕ, ಅಡಿಗ, ಜಿ.ಎಸ್. ಶಿವರುದ್ರಪ್ಪ, ಶಾಂತಿನಾಥ ದೇಸಾಯಿ, ಅನಂತಮೂರ್ತಿ, ಯಶವಂತ ಚಿತ್ತಾಲ, ಲಂಕೇಶ್, ತೇಜಸ್ವಿ, ವೈದೇಹಿ, ವೀಣಾ ಶಾಂತೇಶ್ವರ, ವಿಜಯಾದಬ್ಬೆ.

ಘಟಕ–೭೬: ಬಂಡಾಯ ಮತ್ತು ದಲಿತ:

ಬರಗೂರು ರಾಮಚಂದ್ರಪ್ಪ, ಬಿ.ಟಿ. ಲಲಿತಾನಾಯಕ, ಸಾರಾ ಅಬೂಬಕ್ಕರ್, ದೇವನೂರು ಮಹಾದೇವ, ಸಿದ್ಧಲಿಂಗಯ್ಯ, ಅರವಿಂದ ಮಾಲಗತ್ತಿ, ಮೊಗಳ್ಳಿ ಗಣೇಶ.

ಬ್ಲಾಕ್–೨೦: ಆಧುನಿಕ ಕನ್ನಡ ಕಾವ್ಯ ಮತ್ತು ಸಾಹಿತ್ಯ ಪ್ರಕಾರಗಳು

ಘಟಕ–೭೭: ಕಾವ್ಯ ಪ್ರಕಾರಗಳು: ಭಾವಗೀತೆ, ಸುನೀತ, ಶೋಕಗೀತೆ, ಪ್ರಗಾಥ.

ಘಟಕ–೭೮: ಕಥನ ಕಾವ್ಯ, ಖಂಡ ಕಾವ್ಯ, ಮಹಾಕಾವ್ಯ.

ಘಟಕ–೭೯: ಸಾಹಿತ್ಯ ಪ್ರಕಾರಗಳು: ಕಥೆ, ಕಾದಂಬರಿ, ನಾಟಕ ಜೀವನ ಚರಿತ್ರೆ.

ಘಟಕ–೮೦: ಲಲಿತ ಪ್ರಬಂಧ, ಆತ್ಮಕತೆ, ಪ್ರವಾಸ ಸಾಹಿತ್ಯ, ಸಂಪಾದನೆ, ವಿಚಾರ ಸಾಹಿತ್ಯ, ವಿಜ್ಞಾನ ಸಾಹಿತ್ಯ

ಪರಾಮರ್ಶನ ಗ್ರಂಥಗಳು

೧. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ: ಎಲ್.ಎಸ್. ಶೇಷಗಿರಿರಾವ್, ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್, ಬೆಂಗಳೂರು, ೧೯೯೨

೨. ಯುಗಧರ್ಮ ಮತ್ತು ಸಾಹಿತ್ಯ ದರ್ಶನ: ಕೀರ್ತಿನಾಥ ಕುರ್ತಕೋಟಿ, ಮನೋಹರ ಗ್ರಂಥ ಮಾಲೆ, ಧಾರವಾಡ, ೧೯೯೧

೩. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಇತಿಹಾಸ: ರಂ.ಶ್ರೀ. ಮಗುಳಿ, ಗೀತಾ ಬುಕ್ ಹೌಸ್, ಮೈಸೂರು, ೨೦೧೮

೪. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಂಗಾತಿ: ಕೀರ್ತಿನಾಥ ಕುರ್ತಕೋಟಿ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಹಂಪಿ, ಹೊಸಪೇಟೆ, ೧೯೯೫

೫. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಂಗಾತಿ: (ಪ್ರ.ಸಂ) ಬರಗೂರು ರಾಮಚಂದ್ರಪ್ಪ, ಕರ್ನಾಟಕ ಸಾಹಿತ್ಯ ಅಕಾಡೆಮಿ, ೨೦೧೮

೬. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ: ತ.ಸು. ಶಾಮರಾಯ, ತಳುಕಿನ ವೆಂಕಣ್ಣಯ್ಯ ಸ್ಮಾರಕ ಗ್ರಂಥಮಾಲೆ, ಮೈಸೂರು, ೨೦೧೪

೭. ಹೊಸಗನ್ನಡ ಕಾವ್ಯ ಪ್ರಕಾರಗಳು: ಪ್ರಧಾನ ಸಂಪಾದಕರು, ಎ.ರಂಗಸ್ವಾಮಿ, ಲೇ. ಮ. ರಾಮಕೃಷ್ಣ, ಪ್ರಸಾರಂಗ, ಕರಾಮುವಿ, ಮೈಸೂರು, ೨೦೧೦

೮. ಆಧುನಿಕ ಸಾಹಿತ್ಯ ಪ್ರಕಾರಗಳು: ಪ್ರಧಾನ ಸಂಪಾದಕರು, ಎ. ರಂಗಸ್ವಾಮಿ, ಲೇ. ಡಾ. ಜಿ.ಆರ್. ತಿಪ್ಪೇಸ್ವಾಮಿ, ಪ್ರಸಾರಂಗ, ಕರಾಮುವಿ, ಮೈಸೂರು, ೨೦೧೦

DEPARTMENT - ENGLISH

EL-1.1: INTER- DISCIPLINARY COURSE-I (OPEN ELECTIVE)

INDIAN LITERATURE-I

OBJECTIVES

- To help to understand the contribution of Kalidasa to Sanskrit drama as a playwright
- To create an awareness of the importance of Shakuntala and Mrichhakatika as classical Indian texts
- To evaluate Lord Macaulay and Raja Ram Mohan Roy writers of English Prose.
- To introduce the role of Autobiographies in Indian writing in English

BLOCK –I

Kalidasa: Shakuntala
Shudraka: Mrichhakatika

BLOCK -II

Jawaharlal Nehru: An Autobiography
Ram Mohan Roy: Letter to Lord Amherst
Macaulay: Minutes on Indian Education
Vivekananda: Address to the Parliament of Religions

Suggested Reading:

- **M.K.Naik:** Critical Essays on Indian Writing in English. Sahitya Akademi, 1969.
- **Narasimhaiah. C.D:** The Swan and the Eagle. Indian Institute of Advanced Study, 1987.
- **Meenakshi Mukherjee:** The Twice Born Fiction. Heinemann Educational Publishers, 1972.

- **Chirantan Kulshrestha.** Contemporary Indian English Verse: An Evaluation. Arnold-Heinemann, 1981.

DEPARTMENT - HINDI

व्यावहारिक हिंदी एवं व्याकरण

वर्ण विचार

- वर्ण
- स्वर और उसका वर्गीकरण
- व्यंजन और उसका वर्गीकरण
- वर्णों का उच्चारण स्थान
- संधि
- समास

शब्द विचार

- शब्द के भेद
- अर्थ के आधार पर शब्द भेद
- व्युत्पत्ति के आधार पर शब्द भेद
- रचना के आधार पर शब्द भेद
- प्रयोग के आधार पर शब्द भेद
- विकारी और अविकारी शब्द भेद
- अव्यय
- संज्ञा और उसके भेद
- वचन- उसके भेद, वचन परिवर्तन के नियम
- लिंग- उसके भेद, लिंग परिवर्तन के नियम
- काल और उसके भेद
- कारक और विभक्ति- उसके प्रकार,
- सर्वनाम और उसके भेद
- विशेषण और उसके भेद
- क्रिया और उसके भेद
- क्रिया विशेषण और उसके भेद
- समुच्चय बोधक और उसके भेद

- संबंधबोधक और उसके भेद
- विस्मयादिबोधक और उसके भेद
- परसर्ग और उपसर्ग
- वाच्य और उसके प्रकार

वाक्य विचार

- वाक्य का अर्थ और परिभाषा
- वाक्य के प्रकार .... **आदि**

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DEPARTMENT - TELUGU

E. L. 1.1 Thilak Prathyeka Adhyayanam

Block - 1:Thilak Kavithvam - 1

Unit - 1:Amrutham Kurisina Raathri

Unit - 2:Thilak Padhya Kavithaa Vaibhavam

Unit - 3:Thilak Abhiruchulu - Alavaatlu

Unit - 4: Thapala bantrothu

Block - 2: Thilak Kavithvam

Unit - 1:Thilak Sahithya Parichayam - 1

Unit - 2: Thilak Sahithya Parichayam - 2

Unit - 3:Thilak vachana kavithaa Vaibhavam - 1

Unit - 4: Thilak Vachana Kavithaa Vaibhavam – 2

DEPARTMENT - HISTORY

ANCIENT WORLD CIVILIZATIONS

(Egypt, Mesopotamia, Greek, Roman, Inca, Chinese)

Objective: The course is aims to understand major world civilizations. It is to provide a global historical perspective of ancient world which special reference to Egypt, china, Greek, Roman, Inca civilizations.

Pedagogy: personal contact programmes, audio video programmes, online lectures Assignments, etc

Credits: 2.

Examination Duration: 11/2 hours and Maximum Marks:40

Course outcomes:

After completing this course the students should be able to

- Discuss the Egyptian and Mesopotamian civilizations.
- Analyse the political socio economic conditions of Greek Roman civilizations.
- Evaluate the Chinese contributions to ancient world.

Block – I

Unit-1

Egyptian Civilization: Importance of the Nile, Geographical importance, Gift of Nile, Political conditions.

Unit-2

Social, Economic and religious conditions, Literature and learning, arts and architecture.

Unit-3

Mesopotamian Civilization, Sumer and Babylonian, Hammurabi's code, Society and Culture, Economic conditions, art and literature, Assyrian Empire.

Unit - 4

Greek Civilization, Political Organizations, the city, State, Alexander the Great, Greek political theory, Religion, Philosophy, art and architecture, Characteristic of Hellenistic Civilization.

Block – II

Unit - 5

Roman Civilization, The Land and the people, the Government, Roman Republic, Roman Empire, Roman Republic, The Empire, The Patricians and Plebeians, Punic wars.

Unit – 6

Julius Caesar, his wars, fall Augustus Caesar, Social Economic Conditions, Roman art and architecture.

Unit - 7

Painting, Sculpture, Roman Law, Roman Religion, Philosophy, Roman literature, Decline of the Roman Empire.

Unit - 8

Inca Civilisation, Socio – economic Political conditions, Chinese Civilisation, Socio – economic Political conditions.

Suggested readings:

1. Breasted,J.H. : Ancient Times, A History of the early world.
2. Rostovzeff,M.S. : History of Ancient World
3. Schvider.H : The History of Civilization
4. Swain.J.E. : A History of World Civilization
5. Breasted.J.H. : History of Egypt
6. Jastorow.M : The Civilization of Babylonia and Austria
7. Bury.J.E. & OTHERS: The Hellenistic Age
8. Bailey.C : The Legacy of Rome and others
9. Abot.F.F.: Society and Politics of Ancient Rome

DEPARTMENT – ECONOMICS

EL1.1: Economic Policies of India Since 1991.

- **Objective:** To enable the Students to understand the economic policies of India in the era of new economic policy.
- **Pedagogy:** A Combination of Lectures, Group Discussion, Assignments.
- **Credits:** 2 ; Examination Duration: $1\frac{1}{2}$ and Maximum Marks: 50 (Internal Assessment Marks = 10 and Semester-end Examination =40)

Course Inputs

BLOCK – I: India's Economic Policies

UNIT : 1 Economic Policies in India Since 1991

Economic reforms in India – Economic Scenario in India during 1990-91 – Domestic Financial Crisis – Balance of Payment Crisis – Extent of External debt and debt Trap Problem.

UNIT : 2 Need for Reforms

Measures Taken – Devaluation – Privatization – Liberalization – Globalization.

UNIT : 3 Monetary Policy and Fiscal Policy

Narasimhan Committee on Banking and Financial Sector Reforms Since 1998 – Fiscal Reforms: Raja Chellaiah Committee and Tax Reform Policies – Fiscal Prudence and Policies.

UNIT : 4 Structural Adjustments and External Sector in India

Foreign Trade: Trends in Exports and Imports – Balance of Payment and its Crisis – Export Import Policy – In Defence of Import Substitution – Foreign Exchange Policy.

BLOCK : II FDI and the Role of State

UNIT : 5 Foreign Direct Investment (FDI)

Trends in FDI – FDI Policy – Its Impact on the Domestic Economy – Labour Migration: causes and Consequences on Indian Economy – Information and Communication Revolution and India.

UNIT : 6 Challenges to Development in India

Poverty – Unemployment – Poverty alleviation Programmes - urban Poverty and Problems – Income Inequality – Employment Generating Schemes.

UNIT: 7 The Role of State

Parallel Economy in India – Black Money – Corruption – Slams – Redefining the Role of the State and the Markets – Balance between Economic and Socio - Political Goals.

UNIT : 8 Administrative Reforms

Rights to Information – Measures Towards Good Governance – NITI Ayoga and aftermath – Digitalized India – Demonetization – GST – Make in India.

References:

1. Acharya Shankar, (2003) India's Economy: Some Issues and Answers, Academic Foundation, New Delhi.
2. Byres J Terence (Ed.,) (1999) The Indian Economy, Major Debates since Independence, OUP,New Delhi.
3. Datt Ruddar, (2002) Economic Reforms in India - A Critique, S.Chand and Co, New Delhi.
4. Kapila Uma (Ed) (2015) Indian Economy since Independence, Academic Foundations, New Delhi.

5. Kapila Uma, (2005) Understanding the Problem of Indian Economy, Academic Foundation, New Delhi.
6. Misra S.K. & V.K. Puri, (2011) Indian Economy-Its Development Experience**,** Himalaya Pub., House, Mumbai.
7. NCAER, Economic and Policy Reforms in India, NCAER, New Delhi.
8. Rangarajan C, (1998) Indian Economy- Essays on Money and Finance, UBSPD, New Delhi.
9. Sachs D.Jeffrey, A.Varshney & N Bajpai (Ed)(1999) India in the Era of Economic Reforms,OUP, New Delhi.
10. Vaidyanathan A, India's Economic Reforms and Development, OUP, New Delhi

DEPARTMENT - POLITICAL SCIENCE

(OEL-I) Local Government in India

Block-I

Unit:1 Meaning, Nature and Scope of Local Governments.

Unit:2 Evolution of Panchayat Raj Institution in India.

a) Constitute Assembly and Village Panchayat.
b) Balavanth Roy Mehta Committee Report
c) Ashok Mehta Committee Report.
d) G.V.K. Rao Committee Report.

Unit:3 Constitutional Amendments and Panchayat Raj Institutions:

a) Basis of Constitutional Amendment.
b) 73^{rd} and 74^{th} Constitutional Amendment.
c) Karnataka Panchayat Raj At of 1983.
d) Karnataka Panchayat Raj Act of 1993.

Unit:4 Zilla Panchayat: Structure, Functions and Sources of Revenue.

Block-II

Unit:5 Taluk Panchayat : Structure, Functions, Executive Officer, Powers and Functions.

Unit:6 Gram Panchayat: Gram Sabha, Ward Sabha: Structure, Functions and Sources of Revenue.

Unit:7 Panchayat Development Officer and Secretary: Powers and Functions.

Unit:8 Role of Panchayat Raj Institutions in Development (with Reference to Karnataka)

a) Panchayat Raj in Rural Development.
b) Social Change: Empowerment of the Weaker Sections.

References:

1. Verma B. M, Social justice and Panchayath Raj
2. Mutarib-M.A. and Others, Theory of Local Government,
3. Dr. Arjun darshankar, Panchayath Raj aani Nagari.
4. V. B. Patil, Pancayath Raj.
5. A.N. Kulkarni, Bharatiya Sthanik Swashasan,
6. Shantaram Bhosale, Bharatiya Sthanik Shasan,
7. Kikherji. S, Essays on Rural Development.
8. Balaramu. C. H. Administration of Anty Poverty Programmes.
9. 73rd Constitutional Amendment Act, Government of India, 1993.
10. Karnataka Panchayatraj Acts, 1985, 1995.

11. # DEPARTMENT – PUBLIC ADMINISTRATION

12. **INDIAN POLITY – I**

13. **BLOCK – 1**

14. UNIT – 1 Indian Constitution. .

15.

16. UNIT – 2 Preamble - Meaning and Importance.

17.

18. UNIT – 3 Fundamental Rights and Duties.

19.

20. UNIT – 4 Directive Principles of State Policy and Relation with Fundamental Rights.

21.

22. **BLOCK – 2**

23.

24. UNIT – 5 Indian Federalism and Parliamentary system of Government.

25.

26. UNIT – 6 Centre - State Relations. Legislative Administrative and Financial

27.

28. UNIT – 7 Union Executive - President Elections, Powers and Positions.

.

29.

30. UNIT – 8 Council of Ministers and Prime Ministers - Powers and Functions

DEPARTMENT - SOCIOLOGY

Invitation to Sociology

(02 Credits)

Course Description

This course introduces learners to the basic concepts of sociology. It is particularly designed to orient the learners from interdisciplinary background about the essence of sociology and intends to inculcate sociological imagination.

Course Objectives

- To introduce the learner to the basic concepts and processes of sociology
- to comprehend the structural and organizational aspects of society
- to examine the process of social change

Learning Outcomes and Competencies

After successfully completing the course, following outcomes and competencies are possible among the learners. Learner will have/can

- Conceptual precision and clarity about the basic sociological concepts
- Develop sociological imagination and apply to analyze the contemporary events
- explain major social processes of society
- analytical view about Indian social structure
- explicate major process of social change and can conceptualize the changing aspects of Indian society

Course Contents

Block-1 Basic Concepts and Processes

Unit-1 Emergence of Sociology-Factors and Early Thinkers-Sociological Imagination
Unit-2 Society, Community- Associations and Institutions- Culture and Socialization
Unit-3 Social System, Structure and Function
Unit-4 Social Processes-Cooperation, Competition, Conflict, Accommodation and Assimilation

Block-2 Social Organization and Social Change

Unit-5 Caste and Class System-Changes in Caste
Unit-6 Social Mobility and Types
Unit-7 Factors of Social Change

Unit-8 Process of Social Change in India (Sanskritization, Westernization, Modernization and Globalization)

References

1. Berger, Peter L. 1978. An Invitation to Sociology, Allen and Unwin, London. Davis, Kingsley. Human Society, Macmilan, New Delhi.
2. Dumont, Louis, 1988, Homo Hierarchicus. Oxford University Press. Giddens, Anthony. 2009. Sociology. Politi Press, Malden.
3. Inkles, Alex. 2002. What is Sociology, Prentice Hall India, New Delhi. Jayaram, N, 1990, Introductory Sociology, Macmilan, New Delhi.
4. Johnson Harry M., 2011: Sociology: A Systematic Introduction: Allied Publishers, New Delhi.
5. MacIver, R.M and C.H. Page. Society - Introduction to Sociology, Macmilan, New Delhi
6. Samuel, Koenig. 1957. Sociology: An Introduction to Science of Society, Barnes & Nobel Books, London.
7. Singh, Yogendra. 1993: Social Change in India: Crisis and Resilience, Har-Anand, New Delhi.

DEPARTMENT – ANCIENT HISTORY AND ARCHEOLOGY

AHA OE 1.1

World Heritage Sites of India

Block - 1	**Introduction**
Unit - 1	Nature - Scope - Criteria for incorporation of World Heritage sites
Unit - 2	Types of World Heritage sites in India
Block - 2	**Archaeological and Cave Heritage sites**
Unit - 3	Bimbetka - Sanchi- Nalanda – Champaner - Dholavira
Unit – 4	Ajanta – Ellora - Elephant
Block - 3	**North Indian World Heritage Sites**
Unit – 5	Bodh Gaya — Kajuraho–Konarak–Rani kivav– Jaipur,
Unit – 6	Agra Fort – Red Fort - FathepurSikri–Taj Mahal – Humayun's Tomb –

Ahamadabad, Qutub Minar

Block - 4 **South Indian World Heritages Sites**

Unit – 7 Mahabalipuram – Pattadakallu – Chola temples

Unit - 8 Monuments of Hampi – Churches and Convents of Old Goa – Ramappa Temple

References:

1. Marco Canneo, Jasmina: The world heritage sites of UNESCO – TheTreasure of Art
2. ASI: World Heritage Sites Series
3. Individual guide: Books on respective city Individual

DEPARTMENT - EDUCATION

IDC – 1 FOUNDATIONS OF EDUCATION

BLOCK-1 FOUNDATIONS OF EDUCATION – I

Unit-1 Philosophical Foundations
Unit-2 Basic Concepts of Philosophy
Unit-3 Psychology as a Science
Unit-4 Basic Concept in Psychology related to Education

BLOCK-2 FOUNDATIONS OF LEARNING – II

Unit-5 Sociological bases of Education
Unit-6 Educational Issues in Indian Society
Unit-7 Cultural and Historical Foundations
Unit-8 Political and Economic bases of Education

References:

1. Harison and Myers (1970), Education, Manpower and Economic Growth, McGrothill, Oxfords, IBH Publishing Co., New Delhi.
2. Kamala Bhatia & Baldev Bhatia, (1974) The Philosophical and Sociological Foundations of Education, Doaba House, New Delhi.
3. Bhatia B.D, (1974), 'Theory and Principles of Education, Doaba House, Delhi'.
4. Sorokim .P, (1947) 'Society, Culture and Personality', Harper and Brothers Publishers, New York.

DEPARTMENT – COMMERCE

EL1.1: Personal Financial Planning

Objective: To enable the Students to understand about the different Investment Avenues, Saving Schemes designed by various agencies particularly for the individuals.

Pedagogy: A Combination of Lectures, Group Discussion, Assignments.

Credits: 2

Examination Duration: $1\frac{1}{2}$ and Maximum Marks: 50

(**Internal Assessment Marks** = 10 and Semester-end Examination =40)

Course Inputs

Block I

- **Unit -1: Introduction to Financial Planning:** Introduction - The Process Financial Planning – Client Interactions – Time Value of Money Applications – Personal Financial Statements – Cash Flow ad Debt Management – Planning to Finance Education.
- **Unit -2: Financial Planning Process:** Introduction - Setting Goals – Informal Budget Preparation – Investment Opportunities – Financial Vs Physical Investments – Role of a Financial Planner.
- **Unit -3: Savings Plans:** Introduction - Setting Goals – Savings Instruments – Savings Plan – Tax Savings Schemes.
- **Unit -4: Investment Planning:** Introduction - Risk Return Analysis – Mutual Fund – Derivatives – Asset Allocation – Investment Strategies and Portfolio Construction and Management.

Block II

- **Unit -5: Risk Analysis and Insurance Planning:** Introduction - Risk Management and Insurance Decision in Personal Financial Planning – Various Insurance Policies and Strategies for General Insurance – Life Insurance – Motor Insurance – Medical Insurance.

- **Unit -6: Retirement Planning and Benefits:** Introduction - Retirement Need Analysis Techniques – Savings and Investment Plans for Retirement –Employee Provident Fund – Public Provident Fund – Superannuation Fund – Gratuity – Annuity Plans.
- **Unit -7: Tax Planning:** Introduction - Income-tax Computation for Individuals – Companies - Trust and other bodies – Statutory Provisions Pertaining to Capital Gains and Indexation – House Property – Deduction and Allowances.
- **Unit -8:Health Financing:** Introduction - Health Financing Models – Financing of Health in India – National Rural Health Mission – Challenges of Access to Health Care and Service Quality – Health Insurance Mechanism & Financial Protection.

Books Recommended for Reference

01. Khan M.Y, Financial Services, Tata MacGraw Hill.
02. Singhanar V.K, Students' Guide to Income Tax, Taxmann.
03. Ranganathan andMadhuamathi, Investment Analysis and Portfolio Management, Pearson Publications.
04. Gordon and Natarajan, Emerging Scenario of Financial Services, Himalaya Publishing House.
05. George Rejda, Principles of Risk Management and Insurance, Pearson.

DEPARTMENT - MANAGEMENT

COURSE: OE-1 : Disaster Management - Credit: 2

MBAS 459: DISASTER MANAGEMENT

Objectives	: The course aims at familiarizing the students with the concepts of disaster management, need for disaster management and its relevance.
Pedagogy	: Lectures, assignments, Industrial visits and practical exercises, discussions.

1. Understanding Disasters · Meaning, nature, characteristics and types of Disasters, Causes and effects, Disaster: A Global View, Disaster Profile of India, The Disaster Management cycle.
2. Geological and Mountain Area Disasters · Earthquakes · Volcanic Eruption · Landslides Snow Avalanches, Wind and Water Related Natural Disaster · Floods and Flash Floods · Droughts · Cyclones · Tsunamis, Man Made Disasters · Understanding Man-Made Disasters · Fires and Forest Fires · Nuclear, Biological and Chemical disaster · Road Accidents

3. Introduction to disaster Preparedness · Disaster Management: Prevention, Preparedness and Mitigation · Disaster Preparedness: Concept & Nature · Disaster Preparedness Plan · Disaster Preparedness for People and Infrastructure · Community based Disaster Preparedness Plan
4. Roles & Responsibilities of Different Agencies and Govt. · Roll of Information, Education, Communication & Training · Role and Responsibilities of Central, State, District and local administration. · Role and Responsibilities of Armed Forces, Police, Para Military Forces. Role and Responsibilities of International Agencies, NGO's, Community Based Org. (CBO's)
5. Technologies for Disaster Management · Role of IT in Disaster Preparedness · Remote Sensing, GIS and GPS · Use and Application of Emerging Technologies · Application of Modern Technologies for the Emergency communication. · Application and use of ICST for different disasters.
6. Disaster Mitigation · Disaster Mitigation: meaning and concept · Disaster Mitigation Strategies · Emerging Trends in Disaster Mitigation · Mitigation management · Role of Team and Coordination
7. Disaster Management in India Disaster Profile of India – Mega Disasters of India and Lessons Learnt Disaster Management Act 2005 – Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national),Non-Government and Inter-Governmental Agencies. National Disaster management Authority.

References

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
2. Carter, W. Nick, 1991: Disaster Management, Asian Development Bank, Manila.
3. Central Water Commission, 1987, Flood Atlas of India, CWC, New Delhi.
4. Central Water Commission, 1989, Manual of Flood Forecasting, New Delhi.
5. Government of India, 1997, Vulnerability Atlas of India, New Delhi.
6. Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

DEPARTMENT - BIO CHEMISTRY

Basics of Bioinorganic and Biophysical chemistry for Biology graduates.

Bioinorganic chemistry

Coordination Compounds: Transition metals, properties (Colour, Oxidation states, Magnetic properties) Coordinate bond, double and complex salts– differences with examples.

Postulates of Warner's theory. Types of ligands: For examples: uni, bi, polydentate ligands. Coordination number, examples.

Porphyrin nucleus and their classification. Important metallo-porphyrins occurring in nature. Structure and biological importance of Heme, cytochrome, chlorophyll,Vitamin B_{12}.

Nitrogen, Fixation of atmospheric nitrogen – Symbiotic and non-symbiotic. Nitrogen cycle. Environmental pollution by nitrogen compounds. Phosphorous: Importance of Phosphorous compounds in biological system, phosphorous cycle

Oxygen, Formation of ozone in atmosphere. Role of ozone in maintenance of life on earth. Effect of environmental pollutants on ozone layer.

Sulphur and Selenium, Importance of compounds of Sulphur and Selenium in biological systems. Effect of sulphur compounds on environmental pollution.

Biophysical chemistry.

Units in chemistry, Avogadro's number, Mole, Mole fraction, Molarity, Equivalent weight, Normality, Molality. Colligative Properties, Osmotic pressure and its measurements. Hypo-, Hyper- and isotonic solutions. Effect of osmotic pressure on living cells.

Donnan membrane equilibrium. Relative lowering of vapour pressure, Raoult's law. Elevation of boiling point, depression in freezing point.

Adsorption: Freundlich and Langmuir's adsorption isotherm. Applications of adsorption.

Viscosity: Definition, determination of viscosity of liquids & solutions by Ostwald's viscometer (solutions of gum and protein to be taken as examples).

Distribution law, Distribution law, partition coefficient, application of distribution law.

Acids, bases and buffers- Lewis concept of acids and bases. Ionic product of water. pH scale, buffers, Henderson- Hasselbach equation, buffer capacity Choice of buffers. Theory of acid base indicators. pH titration curve and iso-electric pH of amino acids.

Selected References:

1. Basic Principles of Organic Chemistry, Roberts and Caserio, W. A. Benjamin, Inc. (1964).
2. Organic Chemistry, Morrison and Boyd, Allyn and Bacon Inc (1992).
3. Principles of Inorganic chemistry by Cotton & Wilkinson, Wiley (1999).
4. Textbook of Organic chemistry by Ahluwalia V K & Madhuri G Narosa publications (2001).
5. Physical chemistry by Castellan G W, Narosa Publications (2004).
6. Physical chemistry by Chakraborthy D K, Narosa Publications (2004).

DEPARTMENT - BIOTECHNOLOGY

MBT EL –I- Biotechnology and its Applications

Introduction to biotechnology. Principles of biotechnology, classification.

Recombinant DNA Technology

Introduction, outline of genetic engineering procedure, restriction endonucleases,

cloning & expression vectors- plasmids, cloning in plasmid, transformation and detection of transformants- lacZ, genomic and cDNA libraries, gene analysis techniques-hybridization: Southern, Northern, Western, in situ, Polymerase chain reaction.

Microbial and food and environmental Biotechnology

Basics of fermentation technology: Types of microbial culture- batch, continuous and fed-batch. Microbial production: Use of microbes in production of vitamins, enzymes, organic acids, amino acids, polysaccharides, flavors, sweeteners, proteins and antibiotics.
Fermented food products- yogurt, cheese, tempeh, sauerkraut; beverages- wine and beer. Pre- and Pro-biotics, single cell proteins, Genetically modified foods, designer foods.

Current status of biotechnology in environment. Bioconservation, biofuels, gasohol, biogas.Bioremediation: Concepts and principles, bioremediation using microbes, in situ and ex situ bioremediation, biosorption and bioaccumulation of heavy metals.

Plant Biotechnology

Landmarks in Plant tissue culture. Types of cultures- embryo, organ, callus and cell cultures, Somatic embryogenesis, Haploid Production, Androgenesis, Protoplast culture and somatic hybridization. Micropropagation- Methods and stages, applications. Synthetic seeds, somaclonal variation. Production of secondary metabolites by plant cells, Biotransformation.

Plant transformation techniques: Direct and indirect methods of gene transfer in plants. Transgenic plants and crop improvement- herbicide tolerance, disease resistance, abiotic stress tolerance, delayed ripening, improvement of nutritional quality, molecular pharming.

Animal Biotechnology
Basics of animal cell culture techniques, cell lines, physical conditions for culturing animal cells, equipments required, scale-up of culture methods.
Application of animal cell culture- Hybridomas, production of therapeutic antibodies, stem cell technology, cell and tissue engineering.

Genetic engineering of animals: Methods for gene transfer in animals, microinjection, nuclear transplantation, retrovirus-mediated gene transfer, gene knockdown techniques. Transgenic- animals- sheep, pigs, cattle, chickens; applications of transgenic animals.

DEPARTMENT - CHEMISTRY

Block-1	**Title: Periodic Table and chemical Periodicity**
Unit-1	Elements, atomic structure, atomic number, atomic mass, quantum numbers,

	electronic configuration,
Unit-2	Periodic properties of elements, State of Matter, their resources. Important periodic properties of the elements, covalent radii, ionic radii, ionization potential, electron affinity and electronegativity
Unit-3	Concepts of Acids and Bases: Review of acid base concepts. Lux-Flood and solvent system concepts. Hard-soft acids and bases. Applications.
Unit-4	Solutions: Concentration units, solutions of liquids in liquids, Raoult's law, ideal and non-ideal solutions.

Block-2	**Title: Bonding and molecular structure**
Unit-5	Calcification of matter: (elements, compounds, substance and mixture), The three states of matter, physical and chemical properties of matter, fundamental particles of atoms, atomic number, atomic mass, atomic structure of atom molecular formula, empirical formula, molecular mass.
Unit-6	Ions and ionic compounds, properties of ionic compounds, formation of ionic compounds, covalent compounds, properties of covalent compounds, properties of covalent compounds
Unit-7	Metals, properties of metals, theory of metallic bond formation, types of metals conductor, semiconductor and insulators, n-type semiconductors and p-type semiconductors, alloys and superconducting materials.
Unit-8	Acids and bases, general properties of acid and bases, Acid base reactions, oxidation reduction reactions, oxidation number, types of redox reactions, balancing oxidation-reduction equation, exothermic and endothermic reactions energy change in chemical reactions.

DEPARTMENT : CLINICAL NUTRITION AND DIETETICS

OEL-1: HEALTHY LIFESTYLES AND NUTRITION 3 Credits

BLOCK 1: INTRODUCTION TO FOOD AND NUTRITION

Unit 1.- Factors affecting food habits, choices and dietary patterns – Definition of Food, Nutrition, Health, Fitness. Interrelationship between nutrition and health, concept of a desirable dietfor optimum nutrition, health and fitness.

Unit 2-. A brief review of nutrients in general –

- Energy and macronutrients – Carbohydrates, Protein, Fat - functions, sources deficiency disorders and recommended intakes.
- Micronutrients: Minerals – calcium, Iron, Iodine, and other elements, Vitamins – FatSoluble & Water Soluble.

Unit 3: Nutritional assessment- Anthropometric, biochemical, clinical, dietary and Biochemical assessments

Unit 4: Basic principles of planning diet –, RDA for Indians, Food groups, Dietary guidesand balanced diets.

BLOCK 2: PLANNING OF DIET

Unit 5: Principles of planning a normal diet: characteristics of a normal diet, meeting nutrientrequirements of individuals and family. Use of Dietary guidelines for Indians.

Unit 6: Objectives of diet therapy- Regular diet and rationale for modifications in energyand other nutrients, texture, fluid, soft diets etc.

Unit 7: Role of dietician in hospital- specific functions, team approach in patient care, psychological consideration, interpersonal relationship with patients. Nutrition and medicalethics. Hospital dietary- scope and importance, types of food service, quality management.

Unit 8: Nutrition counseling: definition, concept, role of clinical dietician, the recipient and counseling environment and goals of counseling. An overview of systems approach to nutritionalcare and its components (planning, implementation and evaluation).

REFERENCES

- Srilakshmi B (2004) Nutrition Science. New Age International (P) Ltd, Publishers.
- Kango M (2005) Normal Nutrition, Curing diseases through diet. First Edition CBS Publications.Paul S (2003) Text Book of Bio-Nutrition, Fundamental and Management. RBSA Publishers.
- Williams SR (2000) Nutrition and Diet Therapy. Sixth Edition C.V. Melskey Co.
- Mudambi SR and Rajagopal MV (1997) Fundamentals of Foods and Nutrition. New AgeInternational (P) Ltd, Publishers.
- Swaminathan M (1999) Essential of Food and Nutrition. Vol I and II, Bappco publications,Madras.
- Corinne, H. Robinson 2010– “Normal and Therapeutic nutrition”, Oxford and

IBH publishingcompany, Bombay.

- B. Srilakshmi – 2012“Dietetics”, 4th edition, New age international publisher,Chennai

DEPARTMENT - COMPUTER SCIENCE

ELMCS-01 Mobile App Development: Credit 2

Block – I

Unit-1: Introduction to Mobile Computing: applications, a simplified reference model, Wireless Transmission:

Unit-2: Frequencies of radio transmission, signals, antennas, signal propagation, multiplexing, modulation, spread spectrum, cellular system.

Unit-3 Media Access Control: motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA ,and Comparisons.

Unit-4: GSM, DECT, Wireless LAN: Infrared vs. radio transmission, Infrastructure and ad-hoc networks, IEEE 802.11, HPERLAN, Bluetooth.

Block – II

Unit-5: Mobile Network Layer: mobile IP, dynamic host configuration protocol,

Unit-6: ad-hoc networks. Mobile Transport Layer: Traditional TCP, classical TCP improvements,

Unit-7: TCP over 2.5/3G wireless networks. File Systems, World Wide Web,

Unit-8: Wireless Application Protocol (WAP) and WAP 2.0.

Text book:

1. Jochen H. Schiller, Mobile Communications(2e)

Reference

1. Raj Kamal, Mobile Computing
2. Asoke K. Talukder, Roopa R. Yavagal, Mobile Computing
3. Mazliza Othman,Principles of Mobile Computing and Communications
4. Prasant Kumar Pattnaik, Rajib Mall, Fundamentals of Mobile Computing
5. Ivan Stojmenovic,Handbook of Wireless Networks and Mobile Computer
6. David Taniar, Mobile Computing Concepts, Methodologies, Tools, and Applications

DEPARTMENT - GEOGRAPHY

ELMG –01, Introduction to Physical Geography (Credit-2)

Block-1

Origin, Shape and Size of the Earth, Movement of the Earth- Rotation and Revolution, Effects of the movement of Earth, Coordinates -Latitude, Longitude and Time; Structure of the Earth, Rocks - types, significance, Weathering –types; Agents of Denudation - River, Glacier, Wind and Under Ground water; Structure and Composition of Atmosphere, Weather and Climate

Block-2

Atmospheric Pressure, Winds and Precipitation; Distribution of Land and Sea, Submarine Relief of the Ocean, Temperature and Salinity of Sea Water; Ocean Tides and Oceanic Currents- Atlantic, Pacific and Indian Oceans; Biosphere- Elements, Ecology, Ecosystem, World's Biomes, Biodiversity – Importance, Types and Conservation

References

1. B.S. Negi (1993) Physical Geography. S.J. Publication, Meerut
2. D.S.Lal (1998) Climatology.Chaitnya publishing house, Allahabad
3. K. Siddhartha (2001) Atmosphere, Weather and Climate.Kisalaya publication, New Delhi
4. R.N.Tikka (2002) Physical Geography. KedarnathRamnath&co, Meerut
5. Willian D. Thornbury (1997) Principle of Geomorphology. New Age Internatinal (Pvt Ltd.)New Delhi.

DEPARTMENT -MATHEMATICS

ELMM –01 - FUNDAMENTALS OF MATHEMATICS

(2 Credits)

Block-I: Number Theory: Natural numbers, integers, Real numbers, GCD, LCM, Prime numbers. Surds, Indices, Logarithms, Progressions, Arithmetic Progression, Geometric Progression, Harmonic Progression,

Block-II: Set Theory: Operations of Union, Intersection, Complementation. Relations & Functions: Types of relations One-one, onto, Many-one functions, graphs of functions.
Mathematical Logic: Propositions, logical connectives, Methods of proofs.

Books for Reference:

1. Kolman and Busby: Discrete Mathematics, PHI.
2. S. L. Loney: The Elements of Coordinate Geometry, London Macmillan & Co.

3. B. S. Grewal: Higher Engineering Mathematics, 36th Ed., Khanna Pub.
4. S. Lipschutz and M. Lipson: Theory and Problems of Discrete Mathematics. Schaum Series. 2nd Ed. Tata McGraw Hill.

DEPARTMENT - MICRO BIOLOGY

Microbial World and Microbial Diversity

i. Introduction to microbial world, Physiochemical and biological characteristics; Characteristics of Acellular microorganisms (Viruses); Baltimore classification, general structure with special reference to viroids and prions.
ii. Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility.
iii. Difference between prokaryotic and eukaryotic microorganisms
i. General characteristics of Cellular microorganisms, types - archaebacteria, eubacteria, wall-less forms - MLO (mycoplasma and spheroplasts) with emphasis on distribution and occurrence, morphology, mode of reproduction and economic importance.
ii. Structure, reproduction and economic importance of Mycoplasma.
i. General concept of Phytoplanktons and Zooplanktons. Characteristics, occurrence, thallus organization and classification of Algae.
ii. Cyanobacteria - occurrence, thallus organization, cell ultra structure, reproduction and economic importance. Applications of algae in agriculture, industry, environment and food.

i. Historical developments in the field of Mycology including significant contributions of eminent mycologists.
ii. General characteristics of fungi including habitat, distribution, nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation, mode of reproduction and
iii. Economic importance of fungi with examples in agriculture, environment, Industry, medicine and food.
i. General characteristics, structure, mode of reproduction and economic importance of Actinomycetes with special reference to its application in medicine and industry.
ii. General characteristics, occurrence, classification structure, reproduction and economic importance of Protozoa.

References:

1. Singh,R.P. General Microbiology. Kalyani Publishers, New Delhi (2007).
2. Aneja, K.R. Experiments in Microbiology, Plant pathology and Biotechnology, Fourth edition, NewAge International publishers.

3. Dubey, R.C. and Maheshwary, D.K. Text book of Microbiology. S.chand and company (1999).
4. Powar, C.B. and Daginawal, H.F. General Microbiology. Vol-I and Vol- II, Himalaya Publishing House.
5. Chakraborty P. A Textbook Of Microbiology. New central book Agency (2005).
6. Prescott, M.J., Harley,J.P. and Klein, D.A. Microbiology. 5th Edition WCB Mc Graw Hill, New York, (2002).
7. Tortora, G.J., Funke, B.R. and Case, C.L. Microbiology: An Introduction. Pearson Education, Singapore, (2004).
8. Alcomo, I.E. Fundamentals of Microbiology. VI Edition, Jonesand Bartlett Publishers. Sudbury. Massachusetts, (2001).
9. Black J.G. Microbiology-Principles and Explorations. JohnWiley &Sons Inc. New York, (2002).
10. Pelczar, MJ Chan ECS and Krieg NR, Microbiology McGraw-Hill.
11. Willey, Sherwood, Woolverton. Prescott, Harley, and Klein's Microbiology McGraw-Hill publication
12. Tortora, Funke, Case. Microbiology. Pearson Benjamin Cummings.
13. JACQUELYN G. BLACK. Microbiology Principles and explorations. JOHN WILEY & SONS, INC.
14. Madigan, Martinko, Bender, Buckley, Stahl. Brock Biology of Microorganisms. Pearson
15. Tom Besty, D.C Jim Koegh. Microbiology Demystified Mc GRAW-HILL.

DEPARTMENT -PHYSICS

MP-EL1: Mechanics

BLOCK-A

Unit-1: Laws of Motion: Frames of reference, Newton's Laws of motion, Dynamics of a system of particles, Centre of Mass.

Unit-2: Momentum and Energy: Conservation of momentum, Work and energy, Conservation of energy, Motion of rockets.

Unit-3: Rotational Motion: Angular velocity and angular momentum, Torque, Conservation of angular momentum.

Unit-4: Gravitation: Kepler's Laws (statement only), Newton's Law of gravitation, motion of a particle in a central force field, satellite in circular orbit and applications, geosynchronous orbits, weightlessness, basic idea of global positioning system (GPS).

BLOCK-B:

Unit-5: Oscillations: Simple harmonic motion, differential equation of SHM

and its solutions, kinetic and potential energy, total energy and their time averages, damped oscillations.

Unit-6: Elasticity-1: Hooke's law, stress-strain diagram, elastic moduli-relation between elastic constants, Poisson's ratio, expression for Poisson's ratio in terms of elastic constants, work done in stretching and work done in twisting a wire.

Unit-7: Elasticity-2: Twisting couple on a cylinder - determination of rigidity modulus by static torsion, torsional pendulum-determination of rigidity modulus and moment of inertia - q,η and □ by Searles method.

Unit-8: Special Theory of Relativity: constancy of speed of light, postulates of special theory of relativity, length contraction, time dilation.

DEPARTMENT -PSYCHOLOGY

EL-1 Introduction to Psychology 2 Credits

Block 1: Introduction to Psychology-I

Unit 1: Introducing Psychology -Definition, Scope, and goals

Unit 2: Branches of Psychology

Unit 3: Motivation

Unit 4: Emotions

Block 2: Introduction to Psychology-II

Unit 5: Sensation, Attention and Perception

Unit 6: Learning, Memory and Forgetting

Unit 7: Intelligence

Unit 8: Personality

References:

1. Charles G.Morris. Albert A. Maisto Psychology an Introduction , Prentice Hall. New Jersy.
2. Feldman, A. R.,Understanding Psychology IV th Ed, 1996, McGraw Hill, New Delhi.
3. Morgan, King, Weisz &Schopler, Introduction to Psychology-V11 Ed,1993, Tata McGraw Hill, New Delhi.
4. Ernest R Hilgard, Richard C Atkinson ,Rita L Atkinson Introduction to Psychology Oxford Publication, New Delhi.

DEPARTMENT : INFORMATION TECHNOLOGY

ELMIT –01: Green Computing (2 Credits)

Course Objective: Study the concepts related to Green IT, Green devices and hardware along with software methods, green enterprise activities, managing the green IT and various laws, standards, protocols along with outlook of green IT.

BLOCK 1: Overview of Green Computing

Unit 1:Green IT Introduction, Overview and issues, Initiatives and standards, Pathways of Green computing, Benefits of Green IT, Environmental Impacts of IT

Unit 2: Green devices and hardware Environmental issues arising from electronic devices, life cycle of electronic devices, Hazards and E-waste Ecycling, Going paperless, Hardware considerations, Greening information systems, Managing Green IT, 3Rs of Green IT, Thinking About Money-Saving Efforts

Unit 3: Green Data Centres and Associated Energy Challenges, Data Centre IT Infrastructure, Data Centre Facility Infrastructure: Implications for Energy Efficiency, IT Infrastructure Management, Green Data Storage, Storage Media Power Characteristics,

Unit 4: Green network and communications, objectives and challenges of green networking, Enterprise Green IT strategy, Approaching Green IT strategies, Business drivers and dimensions for Green IT strategies, Steps in Developing a Green IT Strategy, Metrics and Measurements in Green Strategies

BLOCK 2: Management of Green Computing

Unit 5: Sustainable Information Systems and Green Metrics, Sustainable IT Services, Sustainable IT Roadmap, Enterprise, Green IT Readiness, Readiness and Capability
Green Enterprises and the Role of IT, Organizational and Enterprise Greening, Information Systems in Greening Enterprises, Greening the Enterprise: IT Usage and Hardware,

Unit 6: Managing Green IT, Strategizing Green Initiatives, Implementation of Green IT,
Regulating Green IT: Laws, Standards and Protocols,

Unit 7: Green Cloud Computing and Environmental Sustainability, Cloud Computing and Energy Usage Model: A Typical Example, Features of Clouds Enabling Green Computing, Green Cloud Architecture

Unit 8: Green IT: An Outlook, Awareness to Implementation, Green IT Trends, Greening by IT, A Seven-Step Approach to Creating Green IT Strategy

Text Books:

1. Gangadharan, G. R., & Murugesan, S. (2012). Harnessing Green IT: Principles and practices. Wiley Publication, ISBN: 9788126539680.
2. Smith, B. E. (2013). Green Computing: Tools and Techniques for Saving Energy, Money, andResources. CRC Press.

DEPARTMENT -BOTANY

Plant-Microbe Interactions

Overview of plant microbes interactions,
Introduction, beneficial microbes, Rhizobium bacterium and nitrogen fixation, mycorrhizal fungi.
Plant pathogens, Agrobacterium tumefaciens and crown gall disease,
Mechanisms of plant disease mechanism, some bacterial plant diseases,
Plant viruses and mechanism of plant against viruses attacks.
Fungal pathogen- mechanism of plant disease,
Omycete pathogens, Fungal mediated plant.
General concept of plant immunity,
PAMP-triggered immunity (PTI) and effectors-triggered immunity (ETI).
Transcription activator like effector and their role in virulence and disease resistance.

References

1. Lautenberg, B. (2015). Principles of Plant-Microbes Interactions: Microbes for sustainable Agriculture, Springer.
2. Stacey, G. and Keen, N. T. (1997). Plant-Microbes Interactions, Vol 4, . Springer.
3. Ramasamy, K, (2015). Plant Microbes Interactions, New India Publishing Agency.
4. Martin, F. and Kamoun, S. (2014). Effectors in Plant-Microbes Interactions 1st Edition, Wiley Blackwell.

DEPARTMENT -ZOOLOGY

MZO-IE-1: Parasites, Vectors & Communicable Diseases

Introduction to parasites.

Distribution, types, origin and evolution of parasites. Parasitism.

Types: Ecto-parasites, Endo-parasites and their adaptations.

Pathogenic micro-organisms, brief outline and classification of parasitic protozoan's: Entamoeba, Balantidium, Giardia, Trichomonus, Plasmodium, Leishmania and Trypanosoma and their diseases.

Control measures, diagnosis and therapy.
Pathogenic helminthes and vectors.

Etiology, epidemiology, pathogenesis, diagnosis, prevention and control of disease due to *Trichinella spiralis, Ancylostoma duodenale, Fasciola hepatica,* Schistosoma species.

Pathogenic Cestodes: Life cycle, treatment of diseases caused by Echinococcus, Hymenolepis and Diphyllobothrium. Scope and importance of vectors. Origin and evolution of vectors. Habitat, life cycle, pathogenicity of fleas, mites, ticks, lice's and mosquitoes.

Historical perspectives and scientists involved in the discovery of vectors and communicable Diseases.
Epidemiology, bio-ecology, life cycle of biological and mechanical Vectors. Vector-host-parasites interactions, Host-pathogen interaction, insects transmitting Bacteria and viruses.

Control and management of vectors and vector borne diseases

Control measures: cultural, chemical, biological, genetic and environmental Methods of vectors. Management of biological and mechanical vectors during Different seasons. Integrated Vector Control and Management.

Insecticide resistance in vectors, Drug resistance in pathogens.

Importance of education, awareness among public on communicable diseases and community participation. Covid-19 pandemics. Epidemiology of corona virus and its mutants. Vaccination against corona virus in India and other parts of the world.

DEPARTMENT –FOOD AND NUTRITION SCIENCE

ELMFNS- 01 FOOD PSYCHOLOGY

Credits: 2

BLOCK 1: FOOD: PREFERENCES AND CHOICES

Unit 1: Food: Physiological definition and significance, meaning of food, food classification, Food as statement of self-identity, Social interaction, Cultural identity

Unit 2: The Role of Food and Eating on Personality and Social Development: Psychology of eating, Food and emotion regulation, Food in daily living, Food Socialization, Food and control of others

Unit 3: Food Preferences and Fluctuations: Developmental Models, Cognitive Models & Psychophysiological Models, Physiology of food choice, Likes and Dislikes, acquired food preferences, Attitudes towards change, Food and sensory stimulus, Factors

influencing eating behavior – (biological, environmental, individual, food characteristics, culture etc., Effect of eating on food selection and preferences, Understanding of the body and self – selection of the diet.

Unit 4: Food choices across lifespan and influence of society: The changing role of the senses in food choice and food intake across lifespan, Food in security and health across lifespan, Influence of media and advertisements, Digital platform and influence on food choices

BLOCK 2: EATING DISORDERS AND TREATMENTS

Unit 5: Mood, Emotions, food cravings and addictions: relation with food preferences, Connection between mood and eating, Biological and physiological aspects of food cravings, Stress and eating behavior, Food addiction - description, neurobiology of food addiction

Unit 6: Eating disorders and treatment: Anorexia nervosa, Bulimia nervosa and binge eating Disorder-Definition, Symptoms, believed causes, Classification, Risk factors, Common myths of eating disorders, Treatment & dietary management

Unit 7: Overeating, Obesity and Weight management: Definition, Prevalence, Classification of Body Mass Index, Types & patterns, Etiology, Physiological component, Fad diets, Risk factors, Treatment - Weight management (Behavior & Cognitive), Lifestyle modifications, Dietary modification - (calorie restricted diet)

Unit 8: You are what you eat- Approaches to change the dietary behavior: Multidisciplinary approach, Strategies to support healthy dietary behavior: Encouraging healthy eating, Selection of food, Meal & portion size, developing education materials, Motivation & economics, Benefits of exercise, Stage classification for change, Barriers affecting the clinical outcome

REFERENCES:

1. Smith John L. (2002), The Psychology of Food and Eating (English, Hardcover, Smith John , Publisher: Palgrave MacmillanL.), ISBN: 9780333800201, 0333800206.

Alexandra W. LogueOct 2017, The Psychology of Eating and Drinking Fourth Edition.

Annexure II

INTER- DISCIPLINARY COURSE

(Open Elective) for Second Semester

ವಿಭಾಗ– ಕನ್ನಡ

ಪತ್ರಿಕೆ–೬: ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಇತಿಹಾಸ **EL-2.1 (ಕ್ರೆಡಿಟ್–೨)**

ಬ್ಲಾಕ್–೩೮: ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ಉಗಮ ಮತ್ತು ವಿಕಾಸ

ಘಟಕ–೧೪೯: ಸಾಹಿತ್ಯದ ಉಗಮ, ಬೆಳವಣಿಗೆ, ಉದ್ದೇಶ.

ಘಟಕ–೧೫೦: ಪ್ರಾಚೀನ ಪೂರ್ವ ಶಾಸನಸಾಹಿತ್ಯ.

ಘಟಕ–೧೫೧: ಪಂಪ ಪೂರ್ವ ಯುಗದ ಸಾಹಿತ್ಯ.

ಘಟಕ–೧೫೨: ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆಯ ವಿಭಾಗಕ್ರಮ.

ಬ್ಲಾಕ್–೩೯: ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ

ಘಟಕ–೧೫೩: ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯ ರೂಪಗಳು; ಚಂಪೂ, ವಚನ, ರಗಳೆ, ಷಟ್ಪದಿ, ಸಾಂಗತ್ಯ ಇತ್ಯಾದಿ.

ಘಟಕ–೧೫೪: ಪ್ರಾಚೀನ ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪರಿಕಲ್ಪನೆಗಳು;
ಚರಿತ್ರೆ–ಪುರಾಣ, ಧರ್ಮ–ಕಾವ್ಯಧರ್ಮ, ಹಿಂಸೆ–ಅಹಿಂಸೆ, ಮಾರ್ಗ–ದೇಶಿ, ಲೌಕಿಕ–ಆಗಮಿಕ, ವಸ್ತುಕ–ವರ್ಣಕ, ಪ್ರಭುತ್ವ–ಪ್ರತಿರೋಧ.

ಘಟಕ–೧೫೫: ಪ್ರಾಚೀನ ಕನ್ನಡ ಕವಿ–ಕೃತಿ–ಕಾಲ–ದೇಶ–ಭಾಗ ೧.

ಪಂಪ, ರನ್ನ, ಪೊನ್ನ, ೧ನೆ ಚಾವುಂಡರಾಯ, ನಾಗವರ್ಮ ೨ನೆಯ ಚಾವುಂಟರಾಯ, ನಾಗಚಂದ್ರ, ನಯಸೇನ, ದುರ್ಗಸಿಂಹ, ಬ್ರಹ್ಮಶಿವ, ಕರ್ಣಪಾರ್ಯ, ಜನ್ನ.

ಘಟಕ–೧೫: ಪ್ರಾಚೀನ ಕನ್ನಡ ಕವಿ–ಕೃತಿ–ಕಾಲ–ದೇಶ–ಭಾಗ ೨.

ಆಂಡಯ್ಯ, ನೇಮಿಚಂದ್ರ, ರುದ್ರಭಟ್ಟ ಪ್ರಮುಖ ವಚನಕಾರರು – ಜೇಡರ ದಾಸಿಮಯ್ಯ, ಬಸವಣ್ಣ, ಅಕ್ಕ ಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಚನ್ನಬಸವಣ್ಣ, ಹರಿಹರ, ರಾಘವಾಂಕ, ಕುಮಾರವ್ಯಾಸ, ಲಕ್ಷ್ಮೀಶ, ಪ್ರಮುಖ ಕೀರ್ತನಕಾರರು, ಚಾಮರಸ, ಕುಮಾರವಾಲ್ಮೀಕಿ, ಸರ್ವಜ್ಞ, ಷಡಕ್ಷರಿ, ಸಂಚಿ ಹೊನ್ನಮ್ಮ, ನಂಜುಂಡ, ರತ್ನಾಕರವರ್ಣಿ, ಮುದ್ದಣ, ಕೆಂಪುನಾರಾಯಣ.

ಪರಾಮರ್ಶನ ಗ್ರಂಥಗಳು

೧. ಗತಿಬಿಂಬ : ಜಿ.ಎಸ್. ಶಿವರುದ್ರಪ್ಪ, ಬೆಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಬೆಂಗಳೂರು

೨. ಕಾವ್ಯ ವಿಹಾರ : ಕುವೆಂಪು, ಉದಯರವಿ ಪ್ರಕಾಶನ, ಮೈಸೂರು, ೧೯೬೯

೩. ಸಮಗ್ರ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ : ಬೆಂಗಳೂರು, ವಿಶ್ವವಿದ್ಯಾನಿಲಯ ಬೆಂಗಳೂರು, ೨೦೦೨

೪. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ : ಕೆ. ವೆಂಕಟರಾಮಪ್ಪ, ಪ್ರಸಾರಾಂಗ, ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಮೈಸೂರು

೫. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ: ದೇವುಡು, ಶಾರದಾ ಪ್ರಕಾಶನ, ಮೈಸೂರು, ೧೯೩೫

೬. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಂಗಾತಿ : ಕೀರ್ತಿನಾಥ ಕುರ್ತಕೋಟಿ, ಮನೋಹರ ಗ್ರಂಥಮಾಲೆ, ಧಾರವಾಡ

೭. ಶೈಲಿ : ಎಸ್.ವಿ.ರಂಗಣ್ಣ, ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಮೈಸೂರು, ೧೯೭೬

೮. ಶತಮಾನದ ಕನ್ನಡ ಸಾಹಿತ್ಯ : ಸಂಪಾದಕರು, ಜಿ.ಎಸ್. ನಾಯಕ, ಕನ್ನಡ ಸಾಹಿತ್ಯ ಅಕಾಡೆಮಿ, ಬೆಂಗಳೂರು

೯. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಇತಿಹಾಸ : ರಂ. ಶ್ರೀ. ಮುಗಳಿ, ಕೇಂದ್ರ ಸಾಹಿತ್ಯ ಅಕಾಡೆಮಿ, ನವದೆಹಲಿ, ೧೯೭೩

೧೦. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ : ರಂ.ಶ್ರೀ. ಮುಗಳಿ, ಉಷಾ ಸಾಹಿತ್ಯ ಮಾಲೆ, ಮೈಸೂರು, ೧೯೭೧

೧೧. ಬಿಂಬ: ಚದುರಂಗ, ಸಂವಹನ ಪ್ರಕಾಶನ, ಮೈಸೂರು

೧೨. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ ಸಂಪುಟಗಳು : ಕುವೆಂಪು ಕನ್ನಡ ಅಧ್ಯಯನ ಸಂಸ್ಥೆ, ಮೈಸೂರು. ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಮೈಸೂರು, ೧೯೮೨

೧೩. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಾಚೀನತೆ: ಪ್ರಧಾನ ಸಂಪಾದಕರು, ಎ. ರಂಗಸ್ವಾಮಿ, ಲೇ. ಎಚ್.ಪಿ. ಗೀತಾ, ಜನಪ್ರಿಯ ಕನ್ನಡ ಮಾಲೆ, ಕನ್ನಡ ಅಧ್ಯಯನ ಮತ್ತು ಸಂಶೋಧನಾ ವಿಭಾಗ, ಕರಾಮುವಿ, ಮೈಸೂರು, ೨೦೧೧

೧೪. ಪ್ರಾಚೀನ ಕನ್ನಡ ಕಾವ್ಯ ಸ್ಥಿರತೆ ಮತ್ತು ಚಲನ ಶೀಲತೆ : ಪ್ರಧಾನ ಸಂಪಾದಕರು, ಎ. ರಂಗಸ್ವಾಮಿ, ಲೇ. ಶಿವರಾಮಯ್ಯ, ಜನಪ್ರಿಯ ಕನ್ನಡ ಮಾಲೆ, ಕನ್ನಡ ಅಧ್ಯಯನ ಮತ್ತು ಸಂಶೋಧನಾ ವಿಭಾಗ, ಕರಾಮುವಿ, ಮೈಸೂರು, ೨೦೧೨

೧೫. ಕನ್ನಡ ಕೈಪಿಡಿ: ಸಂಪುಟ ೨, ಪ್ರಸಾರಂಗ, ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಮೈಸೂರು, ೨೦೦೭

DEPARTMENT - ENGLISH

EL-2.1: INDIAN LITERATURE-II

OBJECTIVES

- To appreciate artistic values in *Hayavadana* and the use of myth
- To know the importance of Indian English historical plays
- To appreciate Sri Aurobindo as a poet and critic
- To comprehend the different theories of aesthetic experience of art

BLOCK -I
Girish Karnad: Hayavadana
Gurucharan Das: Larin Sahib

BLOCK –II

M. Hiriyanna: Art Experience
Sri Aurobindo: Selections: The Poets of the Dawn and The Poets of the Dawn 3 (The Future Poetry)

Suggested Reading:

- **K.R.Srinivas Iyengar:** Indian Writing in English .Macmillan, 1979.
- **M.K.Naik:** Critical Essays on Indian Writing in English.Sahitya Akademi, 1969.
- **Narasimhaiah C.D:** The Swan and the Eagle. Indian Institute of Advanced Study, 1987.
- **Meenakshi Mukherjee:** The Twice Born Fiction. Heinemann Educational Publishers, 1972.

DEPARTMENT - HINDI

हिंदी सिनेमा

- सिनेमा का उद्भव और विकास
- मूक चलचित्र और दादा साहब फाल्के युग
- दूसरा पढाव, सवाक चलचित्र अथवा आलमआरा
- रंगीन सिनेमा का युग
- सामाजिक सिनेमा एक विवेचन
- धर्म एवं सांस्कृतिक सिनेमा एक विवेचन
- राजनैतिक सिनेमा एक विवेचन
- आर्थिक सिनिमा एक विवेचन
- हास्य एवं व्यंग्य सिनेमा एक विवेचन
- बाल सिनेमा
- सिनेमा एवं संवेदना
- सिनेमा एव भाषा-शिल्प सिनेमा एवं गायन
- सिनेमा एवं पात्र संयोजना
- सिनेमा एवं नैतिक मूल्य
- अनूदित सिनेमा
- सिनेमा का तुलनात्मक अध्ययन

- फिल्म समीक्षा.....**आदि**

□□□□□□ □□□□□

- सिनेमा साहित्य और समाज- प्रह्लाद अग्रवाल, अनामिका प्रकाशन, नई दिल्ली
- कथाकार कमलेश्वर और हिंदी सिनेमा- उज्ज्वल अग्रवाल, राजकमल प्रकाशन, नई दिल्ली
- बॉलिवुड पाठ विमर्श के संदर्भ- ललित जोशी, वाणी प्रकाशन, नई दिल्ली
- फ्लैशबैक, प्रभुनाथ आज़मी, शिल्पायन, नई दिल्ली
- नाटक के सौ बरस, हरिश्चंद्र अग्रवाल और अजित पुष्कल, शिल्पायन, नई दिल्ली

DEPARTMENT - TELUGU

E. L. 2.1 TELUGU SAMSKRUTHI - SAMAJAM

Block - 1: ANDHRULA CHARITHRA - SAMSKRUTHI
Unit - 1:Samskruthi Vaisistyam
Unit - 2:Andhrula Charithra - Samskruthi Paraspara Prabhavam
Unit - 3:Andhrula kalalu
Unit - 4: Andhrula basha - samajam

Block - 2: ANDHRULA AACHARALU -SAMPRADHAYALU

Unit - 1:Andhrula Pandugalu
Unit - 2: Sthrela Nomulu - Vrathalu
Unit - 3: Andhrula Sangikaacharalu
Unit - 4: Andhrula Sampradhayalu

DEPARTMENT - HISTORY

OEL2.1 Social Reform Movements in Modern India

Objective: The course is aims to trace the causes for the division of society in various sections and need for reformation. Further it explains age old social evils which crippled Indian society.

Pedagogy: personal contact programmes, audio video programmes, online lectures Assignments, etc

Credits: 2. **Examination Duration:** 1 1/2 hours and Maximum Marks: 40

Course outcomes

After completing this course the students should be able to

- Understanding the contributions of the Raja ram Mohan Roy Dayananda Sarawathi towards the Indian modernity

- Analyse the Jyothibai pule Savithribai Pule Ambedkar's contributions to Indian social reform movements
- Evalute the works of Sahu Maharaj and Krishna raja wadiyar IV patronage to social Justice.

Block-I

Unit : 1

Colonial Discovery of India : Orientalism, Anglicism, Evangelism-Understanding Indian Society, Meaning of Social Reform. The Concept of Modernity : Western Impact – Indian Response.

Unit : 2

Rajaram Mohan Roy and Brahmo Samaj, Dayananda Sarawathi and Arya Samaj-Nationalism and Society – Prarthana Samaj.

Unit : 3

Jyothi Ba- Phle and Savithri Ba Pule, Social and education reforms.

Unit : 4

Communalism, Eradication of Communalism, Muslim League, Wahhabi and Pan Islamism-Syed Ahmed and Aligarh Movement.

Block-II

Unit : 5

The debate over the interpretation of Shastras – Ishwar Chandra Vidya Sagar - B.M.Malabari – Vivekananda –M.G. Ranade—Bal Gangadhar Tilak.

Unit :6

Dr. B.R.Ambedkar-, His views on Society, A caste and its annihilation, Religion and Economy, M.K.Gandhi- E.V.Ramswamy Periyar and Sri.Narayanguru, Ayyan kali.

Unit :7

The reformers – Kandukuri Veereshalingam – Pandit Shivanatha Shastry – Gopal Ganesh Agarkar-K.T.Telang-Maharma.

Unit :8

D.K.Karve, Maharaj Saiyyaji Rao Gaekwad of Baroda – Chatrapathi Shahu Maharaj of Kolhapur and Maharaja Krishnaraja Wodeyar IV of Mysore.

Suggested readings:

1. Nararajan : A Century of Social Reform in Indian.
2. Seetharam Singh : Nationalism and Social Reform in India
3. Dhananjaya Keer : Ambedkar, Life and Mission
4. Dhananjaya Keer :Mahatma Jyoti Rao Phule : Father of Social Revolution in India
5. Charless Heimsath R : Indian Nationalism and Hindu social Reform
6. A.S.Altekar : Position of Women In Hindu Civilization.
7. Gail Omvedt : Cultural Revolt in a Colonial Society – The Non – Brahmin Movements in Western India.
8. Gail Omvedt : Dalits and Democratic Revolution.

9. Ravindrakumar : Selected Documents of B.G.Tilak.
10. S. Ramkrishna : Social Reform Movements in Andhra
11. M.K.Gandhi : Women and Social Injustice.

ವಿಜಯ ಪೊಣಚ್ಚು ತಂಬಂಡ (ಸಂ), ಭಾರತ ಉಪಖಂಡದ ಆಧುನಿಕ ಪೂರ್ವ ಚರಿತ್ರೆ ವಿವಿಧ ಆಯಾಮಗಳು – ಸಂಪುಟ–03, ಪ್ರಸಾರಾಂಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಹಂಪಿ.

DEPARTMENT - ECONOMICS

EL2.1: Institutions for International Development

- **Objective:** To enable the Students to understand the need and importance of various International Institutions.
- **Pedagogy:** A Combination of Lectures, Group Discussion, Assignments.
- **Credits:** 2 ; Examination Duration: $1\frac{1}{2}$and Maximum Marks: 50 (Internal Assessment Marks = 10 and Semester-end Examination =40)

Course Inputs

Block – I **Economic Issues at Global and National Level**

Unit – 1 **Globalisation**

Globalisation – Forces Driving Globalisation – Income Inequality – National Integrity – Impact on Labour – Multinational corporations – Global Business Environment – National Business Environment.

Unit – 2 **Legal Issues of Business at Global and National Level**

Political Risks – Legal System – Business Ethics – Centrally Planned Economy – Mixed Economy – Market Economy – Human Development

Unit – 3 **International Trade**

Importance – Volume – Direction – Composition – Trends – Theories of Trade - Mercantilism – Absolute Advantage – Comparative Advantage – International Product Life Cycle – Political, Economic and Cultural Motives behind Government Intervention.

Unit – 4 **GATT and WTO**

Importance – objectives – Functions - GATT and W.T.O – India and WTO.

Block – II **Economic Integration and International Business Issues**

Unit – 5 **Regional Economic Integration**

Meaning – Effects – Integration in Europe: European Union – Integration in Americans : North American Free Trade Agreement (NAFTA) – Latin American Integration Association (LAIA) – Free Trade Area of Americans (FTAA) and Transatlantic Economic Partnership.

Unit – 6 Integration in Asia

Association of Southern East Asian Nations (ASEAN) - Asia Pacific Economic Cooperation (APEC) – Integration in middle East : Gulf Cooperation Council (GCC) – BRICS – SAARC.

Unit – 7 International Financial Markets

International capital markets – Foreign Exchange markets – Currency Convertibility – International Monetary System.

Unit – 8 Issues in International Business

Trade War – Balance of Payment – Terrorism – Oil Crisis – Smuggling – Dumping – Environmental Degradation – Exhibit of Nuclear power – Covid 19 and other pandemics.

References:

01. Apte A.N. (2011) International Financial Management, Tata McGraw Hill Pub., Co. Ltd., New Delhi.
02. Bhambari C.P, (1980) The World Bank and India, Vikas Publishing House, New Delhi.
03. International Development Association, Annual Reports.
04. International Finance Corporation, Annual Reports.
05. International Monetary Fund, Annual Reports.
06. World Bank, (1995) The Evolving Role of the World Bank in the First Half Century, Washington D.C.
07. World Bank, World Bank in India, Washington, D.C. USA
08. World Bank, World Development Reports, and Annual Reports.

Palle Krishna Rao, (2005) WTO, Text and Cases, PSG Excel Series, New Delhi.

DEPARTMENT - POLITICAL SCIENCE

(OEL-I) Indian Constitution

Block-I

Unit:1 Framing of the Indian Constitution.
Unit:2 Preamble and Salient Features of the Indian Constitution.
Unit:3 Fundamental Rights and Duties.
Unit:4 Directive Principles of the State Policy.

Block-II

Unit:5 Union Legislature : Composition, Powers and Functions.

Unit:6 Union Executive : President and Vice-President - Election, Powers and Functions, Prime ministers and Council of Minister - Powers and Functions.

Unit:7 State Legislature : Composition, Powers and Functions, State Executive -Governor and Chief Minister.

Unit:8 The Judiciary : Supreme Court and High Court - Composition, Jurisdiction and Functions.

References:

1. Andre Beteille, 1965. Caste,class, and Power. Berkley: University of California Press.
2. Appadorai, A 1968. india: Studies In Social And Political Development 1947-1967. New Delhi: Aisa Publishing House.
3. Desai, A R. 2016. Social Background of Indian Nationalism. Los Angeles: Papular Prakashan.
4. Granville Austin, 2000. The Indian Constitution: Cornerstone of a Nation. Melbourne: Oxford University Press.
5. Hanson and Douglas, 1972. India`s Democracy. New York city: W W Norton & Co Inc.
6. Johari J C 1974. Indian Government and Politics. New Delhi: Vishal Publications.
7. Karunakaran, K.P 1964. Continuity and Change in Indian Politics. New Delhi: People`s Pub. House.
8. Kochanek. A. 1968. The Congress Party of India: the Dynamics of a One-Party Democracy. New Jersey: Princeton University Press.
9. Morris Jones, 1967. The Government and Politics of India. London: Hutchinson University Library.
10. Myron Weiner, 1957. Party Politics in India. New Jersey: Princeton University Press.
11. Myron Weiner, 1967. Party Building in New Nation. Chicago: University of Chicago Press.
12. Palmer, N D 1971. The Indian Political System. Boston: Houghton Mifflin.
13. Partha Chatterjee, 1998. State and Politics in India. University of Michigan: Oxford University Press.
14. Pylee, M V 1960. Constitutional government in India. Bombay: Asia Pub. House.
15. Rajni Kothari, 1970. Politics in india. The University Of Michigan: Little Brown
16. Rajni Kothari, 1995. Caste in Indian Politics. Telangana: Orient Blackswan.
17. Venkatarangaiya: M Shiviah, 1975. Indian Federalism. New Delhi: Arnold-heinemann Publishers.
18. Zoya Hasan, 2000. The State in Indian Politics. Landon: Sage publication.

DEPARTMENT - SOCIOLOGY

Study of Indian Society -02 Credits

Course Description

Every science has its own classical theories, which stand as eternal in their explanatory power and prowess to transcend the time and region. This course intends to introduce the learners to the classical period of sociology which is not just a bundle of theories but a consistent tradition and formative period, even contemporary theories cannot eschew from being inspired. After studying this course, following learning outcomes can be expected.

Course Objectives

1. To appreciate the organizational framework of Indian society
2. To appreciate the aspects unity and diversity of Indian society
3. Examine the social issues in contemporary India

Learning Outcomes

Following outcomes are expected from the learners after successfully completing the course. Learner can/has

LOC-1: sociological insights about the social structural and organizational aspects of Indian society

LOC-2: present the changes in institutional framework of Indian society

LOC-3: recognize the causes for major social issues and present realistic remedies

Course Content

Block-1 Social Organizations

Unit-1 Unity and Diversity-Problem of Integration

Unit-2 Caste-Characteristics and Recent Changes

Unit-3 Marginalization-SC, ST, OBC and Minorities

Unit-4 Changes in Family and Concerns of the Aged

Block-2 Social Issues in Contemporary India

Unit-5 Environmental Sanitation and Ecological Degradation

Unit-6 Educated Unemployment and Employability

Unit-7 Social Unrest-Terrorism, Naxalism, Communalism and Corruption

Unit-8 Child Rights and Right to Education (RTE)

References

- Ahuja, Ram. 2002. Study of Social Problems. Jaipur & New Delhi: Rawat Publications
- Atal, Yogesh. 1979. The Changing Frontiers of Caste. National Publishing House: Delhi
- Beteille, Andre. 1971. Caste, Class and power. Berkeley: University of California.
- Betteille, Andre. 1974. Social Inequality, New Delhi: Oxford University Press.
- Betteille, Andre. 1992. Backward Classes in Contemporary India. New Delhi: Oxford University Press.
- Berreman, G.D. 1979. Caste and Other Inequalities: Essays in Inequality. Meerut: Folklore Institute.
- Dube, Leela. 1997. Women and Kinship, Comparative Perspectives on Gender
- Southern South Asia.
- Das, Veena. 2006. Oxford Handbook of Indian Sociology. New Delhi: Sage
- Dube, S C. 1990. Study of Indian Society. New Delhi: National Book Trust
- Jha, Hetukar. 2015. Sanitation in India. Delhi: Gyan Books.

- Karve, Iravathi. 1990. Kinship Organization in India.
- Pais, Richard. 2015. Sociology of Sanitation. Delhi: Kalpaz Publications.
- Pathak, Bindeshwar. 2015. Sociology of Sanitation. Delhi: Kalpaz Publications.
- Singer, Milton & Cohen, Bernards. 1996. Structure and change in Indian Society. Jaipur: Rawat
- Singh, Yogendra, Modernization of Indian Tradition. Jaipur & New Delhi: Rawat
- Srinivas, M N. 1995. Social Change in Modern India: Orient Blackswan
- Srinivas, M. N. 1962. Caste in Modern India and Other Essays. Asia Publishing House: Delhi.

DEPARTMENT – ANCIENT HISTORY AND ARCHEOLOGY

AHA
OE 2.1

Cultural History of Hoysalas (OE)

Block - 1	**Early Kings**
Unit - 1	Archeological and Literary Sources
Unit - 2	Theories of Origin of Hoysalas – Sala – Nripakama – Ereyanga
Block - 2	**Important Rulers**
Unit - 3	Vishnuvardhana - VeeraNarasimha – I
Unit - 4	Ballala – II - Narasimha – II - Narasimha III and Ballala – III
Block - 3	**Cultural Contributions**
Unit - 5	Hoysala polity - Economy
Unit –6	Hoysala Society – Religion – Education - literature
Block - 4	**Art and Architecture**
Unit - 7	Hoysala Architecture
Unit – 8	Hoysala Art

References:

1. Epigraphia Carnatica: Relevant Volumes
2. Derrett Duncan, M.J: The Hoysalas, 1957
3. Dhakey M.A: Encyclopedia of Indian Temple Architecture
4. Desai P.B: History of Karnataka
5. Foekema Gerard: A Complete Guide to Hoysala Temples
6. Gopinatha Rao T.A: Elements of Hindu Iconography,Vols
7. Kelleson Collyer: The Hoysala Artists – Their Identity Style
8. Krishna Murthy M.S: The Hoysala Art, Kuppam, 2007
9. Padmnabha K: Hoysala Sculptures : A cultural Study

10.Sheik Ali B (Ed): The Hoysala Dynasty , 1972 11.William Cohelo: The HoysalaVamsha, 1950
12.Annual Reports of the Department of Archaeology, Mysore 1939 – 46
13.Settar S: Hoysala Temples
14. Marg: In Praise of Hoysala Art
15. Narasimhachar R; Lakshmidevi Temple at Doddagaddhavalli
16. Shastri KAN: The Cholas, 17.Shastri KAN: History of South India

DEPARTMENT - EDUCATION

IDC - 2 HIGHER EDUCATION

BLOCK - 1 HIGHER EDUCATION – ORGANIZATION AND TEACHING – LEARNING

Unit-1 Higher Education
Unit-2 Teaching Learning in Higher Education – I
Unit-3 Teaching-Learning in Higher Education – II
Unit-4 Problems and Innovations in Higher Education

BLOCK - 2 HIGHER EDUCATION – SOCIO-PSYCHOLOGICAL AND MANAGEMENT DIMENSIONS

Unit-5 Socio-Psychological Background of College Students
Unit-6 Problems of College Students
Unit-7 Higher Education – Management Dimensions
Unit-8 Higher Education Teacher

References:

1. Shills Edward (1989) 'The modern university Liberal Democracy'.
2. Abraham, Abu (1988) The Penguin, Book of Indian cartoons, New Delhi.
3. Chandra, Bipan (1984) Communalism Modern India, New Delhi.
4. Chauhan S.S (1989) Innovations in Teaching Learning Process, New Delhi, Vikas.
5. Srivastva A.B and Sharma K.K (1985) Elementary Statistics in Psychology and Education, New Delhi, Sterling Publishers Pvt. Ltd.,

DEPARTMENT - COMMERCE

Elective Course – EL2.1: Entrepreneurship Development

- **Objective:** To enable the Students to understand about the different aspects of Entrepreneurship Development.
- **Pedagogy:** A Combination of Lectures, Group Discussion, Assignments.
- **Credits:** 2 ; Examination Duration: $1\frac{1}{2}$and Maximum Marks: 50 (Internal Assessment Marks = 10 and Semester-end Examination =40)

Course Inputs

Block I

- **Unit -1: Entrepreneur and Entrepreneurship:** Introduction - Evolution – Characteristics – Distinction between Entrepreneur and Manager – Functions – Types – Entrepreneur - Concept of Entrepreneurship – Growth of Entrepreneurship in India – Role of Entrepreneurship in Economic Development
- **Unit – 2: Women Entrepreneurship:** Introduction - Concept – Statistical Evidence – New Age Women – Functions – Growth - Problems – Recent trends in Development of Women Entrepreneurship.
- **Unit -3: Rural Entrepreneurship:** Introduction - Meaning – Need – Rural Industrialisation in Retrospect – Problems – Development of Rural Entrepreneurship – NGOs and Rural Entrepreneurship.
- **Unit -4: Conceptual Models of Entrepreneurship:** Introduction - Models of John Kao – Udai Pareek and Nadakarni– NISIET.

Block II

- **Unit – 5: Factors Affecting Entrepreneurial Growth And Competencies:** Introduction - Economic Factors – Non-Economic Factor – Government Actions - Entrepreneurial Competencies: Meaning – Major Entrepreneurial Competencies – Developing Competencies.
- **Unit -6: Entrepreneurial Motivation and Mobility:** Introduction - Motivation – Motivation Theories – Motivating Factors – Achievement Motivation – Factors Influencing Mobility – Occupational Mobility – Locational Mobility.
- **Unit – 7: Entrepreneurship Development Programes:** Introduction - Need for EDPs - Objectives of EDPs – Course Contents and Curriculum of EDPs – Phases of EDPs – Evaluation of EDPs.
- **Unit -8: Institutional Support System for Entrepreneurship:** Introduction - DICs – SISIs – SIDCOs – NISIET – EDIT – NIESBU – TCOs- A Broad Overview of Central and State Level Financing Institutions.

Books Recommended for Reference

a. Vasanth Desai, The Dynamics of Entrepreneurial Development and Management, Himalaya Publishing House.
b. **A.** N Desai, Entrepreneurship Management, Ashish Publishing House.
c. Chandra Prasanna, Project Preparation, Appraisal and Implementation, Tata McGraw Hill.
d. Khanka, S.S, Entrepreneurial Development, S. Chand Publications.
e. Prasanna Chandra, Projects: Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill.

DEPARTMENT - MANAGEMENT

E-COMMERCE

Credits: 2

Module 1: E-commerce and its Technological Aspects:
Overview of developments in Information Technology and Defining E-Commerce: The scope of E commerce, Electronic Market, Electronic Data Interchange, Internet Commerce, Benefits and limitations of E-Commerce, Produce a generic framework for E-Commerce, Architectural framework of Electronic Commerce, Web based E Commerce Architecture.
Module 2: Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. Digital economy: Identify the methods of payments on the net – Electronic Cash, cheques and credit cards on the Internet.

References:
1. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.
2. Ravi Kalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.
3. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A Managerial Perspective", Addison-Wesley.
4. Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3rd Edition, PHI, Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3RDEdition, Pearson Education

DEPARTMENT - BIO CHEMISTRY

Basics of Bioorganic chemistry for Biology graduates.

Introduction to Organic chemistry: Classification of organic compounds, unique characteristics, IUPAC nomenclature of organic compounds (including bifunctional).

Reaction mechanisms: Classification of organic reactions: substitution, addition, elimination and rearrangement with one example for each. Concepts of the following – carbon anions, carbon cations, free radicals, carbenes, nucleophiles and electrophiles.

Cycloalkanes**:** Reactivities and relative stability, Bayer's strain theory. Sachse-Mohr theory. Boat and chair form of cycloalkanes. Axial and equatorial bonds.

Arenes: Structue of Benzene–resonance and molecular orbital theories. Aromaticity. Mechanism of Nitration and Friedel-Craft's reaction. Electronic interpretation of the orienting influence of substituents in the electrophilic substitution of Toluene, Chlorobenzene, Nitrobenzene and Phenol. Polynuclear hydrocarbons–Resonance structures of Naphthalene, Anthracene and phenanthrene.

S_N1 and S_N2 reactions, mechanism with an example for each. Concept of elimination reactions. Example –n-butyl chloride.

Alcohols: Classification, monohydric, alcohols-distinguishing reactions for primary, secondary and tertiary alcohols.

Trihydric alcohols: Glycerol, Properties, ($KHSO_4$, HNO_3, Oxalic acid and HI)

Phenols: Acidity of phenols, Effect of substitution on acidity

Stereochemistry: Stereoisomerism, types, Fischer-projection formulae, asymmetric carbon atom, molecular dissymmetry, chirality, optical isomerism: ex. Glyceraldehyde, Lactic acid, Tartaric acid. Nomenclature of enantiomers. D- and L- system, Recemisation and resolution.

Heterogeneous and Homogenous hydrogenation of oils.

Selected References:

1. Basic Principles of Organic Chemistry, Roberts and Caserio, W. A. Benjamin, Inc. (1964).
2. Organic Chemistry, Morrison and Boyd, Allyn and Bacon Inc (1992).
3. Principles of Inorganic chemistry by Cotton & Wilkinson, Wiley (1999).
4. Textbook of Organic chemistry by Ahluwalia V K & Madhuri G Narosa publications (2001).
5. Physical chemistry by Castellan G W, Narosa Publications (2004).
6. Physical chemistry by Chakraborthy D K, Narosa Publications (2004).

DEPARTMENT - BIOTECHNOLOGY

MBT EL-2 FUNDAMENTAL OF BIOTECHNOLOGY

Scope and Introduction to Biotechnology History & Introduction to Biotechnology What is Biotechnology? Definition of Biotechnology, Traditional and Modern Biotechnology, Branches of Biotechnology

Plant, Animal Biotechnology, Marine Biotechnology, Agriculture, Healthcare, Industrial Biotechnology, Pharmaceutical Biotechnology, Environmental Biotechnology.

Applications Biotechnology Applications of Biotechnology in Agriculture : GM Food, GM Papaya, GM Tomato, Fungal and Insect Resistant Plants BT Crops, BT Cotton and BT Brinjal Pros and Cons Biotechnological applications in Crop and Livestock Improvements Modifications in Plant Quality Golden Rice, Molecular Pharming, Plant Based Vaccines Ethics in Biotechnology and IPR 15 lectures

Food and Fermentation Biotechnology Food Biotechnology Biotechnological applications in enhancement of Food Quality Unit Operation in Food Processing Quality Factors in Pre processed Food Deterioration and its Control Rheology of Food Products Microbial role in food products Yeast, Bacterial and other Microorganisms based process and products Fermentation Technology Definition, Applications of Fermentation Technology Microbial Fermentations Overview of Industrial Production of Chemicals (Acetic Acid, Citric Acid and Ethanol), Antibiotics, Enzymes and Beverages

Molecular Biology - Replication DNA Replication in Prokaryotes and Eukaryotes Semi-conservative DNA replication, DNA Polymerases and its role, E.coli Chromosome Replication, Bidirectional Replication of Circular DNA molecules. Rolling Circle Replication, DNA Replication in Eukaryotes DNA Recombination – Holliday Model for Recombination Transformation

Mutation and DNA Repair Definition and Types of Mutations. Mutagenesis and Mutagens. (Examples of Physical, Chemical and Biological Mutagens) Types of Point Mutations, DNA REPAIR Photo reversal, Base Excision Repair, Nucleotide Excision Repair, Mismatch Repair, SOS Repair and Recombination Repair.

Genetic Engineering Experimental evidences for DNA and RNA as Genetic Material. Genetic Engineering in Ecoli and other Prokaryotes, Yeast, Fungi and Mammalian Cells Cloning Vectors-Plasmids (pBR 322, pUC) Vectors for Plant and Animal Cells, Shuttle Vectors, YAC Vectors, Expression Vectors Enzymes- DNA Polymerases, Restriction Endonucleases, Ligases, Reverse Transcriptase's, Nucleases, Terminal Transferees, Phosphatases Isolation and Purification of DNA (Genomic, Plasmid) and RNA,, Identification of Recombinant Clones

DEPARTMENT - CHEMISTRY

Block-1	**Title: Physical parameters of molecules**
Unit-1	Thermodynamics: First and second laws of thermodynamics. Concept of entropy and free energy, entropy as a measure of unavailable energy. Entropy and free energy changes and spontaneity of process.
Unit-2	Chemical kinetics: Rate and order of reaction. Factor affecting the rate of reaction. And determination Order of reaction. Energy of activation and its determination. Brief account of collision and activated complex theories.
Unit-3	Ionic equilibria: pH scale, buffer solutions, calculation of pH of buffer solutions, buffer capacity and buffer index, buffer mixtures.
Unit-4	Electrochemistry: Electrolytic conductance, specific, equivalent and molar conductance, ionic mobility and transference number, factors affecting the electrolytic conductance, Arrhenius theory of strong and weak electrolytes, assumptions of DebyeHuckel theory of strong electrolytes.

Block-2	**Title: Organic molecules**
Unit-5	Introduction to organic chemistry, atomic orbitals, sigma and pi bond formation-molecular orbital (MO) method, sp, sp2 and sp3 hybridization, bond length, bond dissociation energies and bond angles
Unit-6	Electronegativity and polarity of the bonds. Classifications and reactions of organic compounds (with examples).

Unit-7	Biological importance of natural products: Amino acids, proteins, carbohydrates (cellulose, starch, glycogen), lipids (fats and oils, phospholipids), nucleic acids, steroids, alkaloids, vitamins, flavonoids.
Unit-8	Applications of synthetic products: Dyes, drugs, polymers (plastics), soaps and detergents, pesticides and pheromones.

DEPARTMENT – CLINICAL NUTRITION AND DIETETICS

OEL - 2: NUTRACEUTICALS AND HEALTH FOODS **2 Credits**

BLOCK 1. NUTRACEUTICALS:

Unit - 1: Introduction to Nutraceutical

Unit - 2: Use of Nutraceuticals in Traditional Health Sciences

Unit – 3: Functional Foods

Unit – 4: Development of Nutraceutical and Functional Foods

BLOCK 2: FUNCTIONAL FOODS AND NUTRACEUTICALS OF PLANT, ANIMAL AND MIRCIBIAL ORIGIN

Unit - 5: Prebiotics and Probiotics

Unit - 6: Bio Active Peptides and Phyto- Chemicals

Unit - 7: Fats and Oils- Omega 3 Fatty Acids:

Unit - 8: Sugar Substitutes / Sweeteners

REFERENCES:

- Tai Hu Guan, (2018), text book of Nutraceuticals and Health, Scitus Academics Publisher, Wilmington DE 19804, United States of America.
- Wildman REC, (2016), Handbook of Nutraceuticals and Functional Foods, 2nd edition, CRC Press publishers, Boca Raton, Florida (USA).
- Athapol Noomhorm, Imran Ahmad, Anil Kumar Anal (2014), Functional Foods and Dietary Supplements Processing, Effects and Health Benefits, first edition, published by John Wiley & Sons, Ltd. UK 111 River Street, Hoboken, NJ 07030-

5774, USA

- Wildman REC, (2001) Handbook of Nutraceutical and Functional Foods, CRC Press, USA.Ghosh D et al, (2012) Innovations in Healthy and Functional Foods, CRC Press, USA. Pathak YV (2011) Handbook of nutraceuticals Volume 2, CRC Press, USA.

DEPARTMENT - COMPUTER SCIENCE

ELMCS- 02: E -Commerce

BLOCK-1

UNIT-1: Overview of developments in Information Technology and Defining E-Commerce: The scope of E commerce, Electronic Market, Electronic Data Interchange, Internet Commerce, Benefits and limitations of E-Commerce, Produce a generic framework for E-Commerce,

UNIT-2: Architectural framework of Electronic Commerce, Web based E Commerce Architecture. Consumer Oriented E Commerce E-Retailing: Traditional retailing and e retailing, Benefits of e retailing,

UNIT-3: Key success factors, Models of e retailing, Features of e retailing. E services: Categories of e-services, Web-enabled services, matchmaking services,

UNIT-4: Information-selling on the web, e entertainment, Auctions and other specialized services. Business to Business Electronic Commerce

BLOCK-2

UNIT-5: Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System:

UNIT-6: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment. Digital economy: Identify the methods of payments on the net – Electronic Cash, cheques and credit cards on the Internet.

UNIT-7: Security in E Commerce Threats in Computer Systems: Virus, Cyber Crime Network Security: Encryption, Protecting Web server with a Firewall, Firewall and the Security Policy, Network Firewalls and Application Firewalls, Proxy Server. Issues in E Commerce Understanding Ethical,

UNIT-8: Social and Political **issues in E-Commerce**: A model for Organizing the issues, Basic Ethical Concepts, Analyzing Ethical Dilemmas, Candidate Ethical Principles Privacy and Information Rights: Information collected at E-Commerce Websites, The Concept of Privacy, Legal protections Intellectual Property Rights: Types of Intellectual Property protection, Governance.

References:

1. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.
2. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley.
3. Efraim Turban, Jae Lee, David King, H.Michael Chung, “Electronic Commerce–A ManagerialPerspective", Addison-Wesley.
4. Elias M Award, “Electronic Commerce from Vision to Fulfilment”, 3rd Edition, PHI, Judy Strauss, Adel
5. El-Ansary, Raymond Frost, “E-Marketing”, 3RDEdition, Pearson Education.

DEPARTMENT - GEOGRAPHY

ELMG –02 Regional Geography of Karnataka (Credits – 2)

Block-1

Physical setting - Location, Administrative divisions, Geology, Physiographic divisions of the Karnataka; Climate and Rivers; Soils and Vegetation; Irrigation in Karnataka, Major Multipurpose River Valley Projects, Major water problems and Issues - Yetthinahole, Linganamakki, Mekedatu, Krishna-Cauvery valley-linking Rivers.

Block-2

Agriculture - Major of Crops: Rice, Jowar, Ragi, Wheat, Oil seeds, Sugarcane, Cotton, Tobacco and Coffee; Minerals Resources - Iron ore, Manganese, Bauxite, Copper, Gold; Major Power Projects - Hydel, Thermal and Atomic Energy power plants; Industries - Cotton Textile, Silk Textile, Sugar, Iron and Steel, Cement and Paper industries, Industrial Regions of Karnataka; Transportation - Roads, Railway, Water way, Ports/Harbors and Airways; Population - growth, distribution and density

References:

1. Directorate of Information and Tourism, Government of KarnatakaKarnataka State Gazetteer
2. Mallappa, P., (2014) Geography of Karnataka, Chethana book publishers, Mysuru
3. N.B.K Reddy & G.S. Murthy, (1967) Regional Geography of Mysore State
4. R.P. Misra, (1973) Geography of Mysore
5. Ranganath, (2018) Geography of Karnataka, Mysore Book House, Mysuru

DEPARTMENT - MATHEMATICES

Combinatorics and Graph Theory (ELMM –02) **2 Credits**

Block-I: Permutations and Combinations, Pigeon-hole principle, Principle of inclusion and exclusion.

Block-II: Graphs, Vertices of graphs, Walks and connectedness, Degrees, Operations on graphs, Blocks – Cutpoints, bridges, Block graphs and Cutpoint graphs. Trees - Elementary properties of trees,

Books for Reference:

1. C. L. Liu – Elements of Discrete Mathematics, McGraw-Hill, 1986.
2. Kenneth H. Rosen – Discrete Mathematics and its Applications, McGraw-Hill, 2002.
3. F. Harary – Graph Theory, Addition Wesley Reading Mass, 1969.
4. N. Deo – Graph Theory With Applications to Engineering and Computer Science, Prentice Hall of India, 1987.
5. K. R. Parthasarathy – Basic Graph Theory, Tata McGraw-Hill, New Delhi, 1994.
6. G. Chartand and L. Lesniak – Graphs and Diagraphs, wadsworth and Brooks, 2nd Ed.,
7. Clark and D. A. Holton – A First Look at Graph Theory, Allied publishers.
8. D. B. West – Introduction to Graph Theory, Pearson Education Inc.,2001, 2nd Ed.,
9. J. A. Bondy and U. S. R. Murthy – Graph Theory with applications, Elsevier, 1976.

DEPARTMENT - MICROBIOLOGY

Microbes in Sustainable Agriculture and Development

i. Soil Microbiology: Soil as Microbial Habitat, Soil profile and properties,
ii. Soil formation, Diversity and distribution of microorganisms in soil.
iii. Microbial Activity in Soil and Green House Gases- Carbon dioxide, methane, nitrous oxide, nitric oxide – production and control
i. Mineralization of Organic & Inorganic Matter in Soil: Mineralization of cellulose, hemicelluloses, lignocelluloses, lignin and humus, phosphate, nitrate, silica, potassium .
ii. Microbial Control of Soil Borne Plant Pathogens: Biocontrol mechanisms and ways, Microorganisms used as biocontrol agents against Microbial plant pathogens, Insects, Weeds.
iii. Biofertilization, Phytostimulation,
iv. Bioinsecticides: Plant growth promoting bateria, biofertilizers – symbiotic (Bradyrhizobium, Rhizobium, Frankia),
v. Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphatesolubilizers,algae),
vi. Novel combination of microbes as biofertilizers, PGPRs

i. Secondary Agriculture Biotechnology: Biotech feed, Silage, Biomanure, biogas, biofuels – advantages and processing parameters.
ii. GM crops: Advantages, social and environmental aspects, Bt crops, golden rice, transgenic animals.

References:

1. EldorA.Paul. SoilMicrobiology. EcologyandBiochemistry.VIEdition:Academic Press, (2007).
2. EugeneL. Madsen. Environmental Microbiology:FromGenomestoBiogeochemistry. IEdition,Wiley-BlackwellPublishing. (2008).
3. Agrios, G.N. Plant pathology. Harcourt Asia Pvt. Ltd. (2000).
4. Buchanan. B.B., Gruissem, W. and Jones, R.L Biochemistry and Molecular Biology of Plants. I.K. International Pvt. Ltd. (2000).
5. Mehrotra R S and Ashok Agrawal. Plant Pathology. Tata Mc Graw Hill ,6th reprint (2006).
6. K. S. Bilgrami, H. C. Dube. A textbook of modern pathology. 6th Edition, Vani Educational Books, a division of Vikas, (1984).
7. K.R. Aneja .Experiments in Microbiology, Plant Pathology and Biotechnology . New Age

Publications.2017

DEPARTMENT - PHYSICS

MP-EL2: Waves and Optics

BLOCK-A:

Unit-1: Superposition of Two Collinear Harmonic oscillations: linearity & superposition principle. (i) Oscillations having equal frequencies and (ii) oscillations having different frequencies (Beats).

Unit-2: Waves Motion- General: Transverse waves on a string, travelling and standing waves on a string, normal modes of a string, group velocity, phase velocity, plane waves, Spherical waves, wave intensity.

Unit-3: Fluids: Surface tension: synclastic and anticlastic surface - excess of pressure - application to spherical and cylindrical drops and bubbles. viscosity - rate flow of liquid in a capillary tube - Poiseuille's formula - determination of coefficient of viscosity of a liquid.

Unit-4: Sound: Simple harmonic motion - forced vibrations and resonance intensity and loudness of sound, intensity levels, musical notes, musical scale, acoustics of buildings: reverberation and time of reverberation, absorption coefficient, Sabine's formula - measurement of reverberation time.

BLOCK-B:

Unit-5: Wave Optics: electromagnetic nature of light, definition and

properties of wave front, Huygen's Principle.

Unit-6: Interference: Interference: division of amplitude and division of wavefront. Young's double slit experiment, interference in thin films: parallel and wedge-shaped films, Newton's Rings: measurement of wavelength and refractive index.

Unit-7: Diffraction: Fraunhofer diffraction- single slit and double Slit, multiple slits and diffraction grating, Fresnel diffraction: half-period zones, zone plate, Fresnel diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis.

Unit-8: Polarization: Transverse nature of light waves, plane polarized light – production and analysis, circular and elliptical polarization.

DEPARTMENT -PSYCHOLOGY

EL-2 Psychology in Everyday Life 2 Credits

Block 1: Applications of Psychology-I

Unit 1: Psychology as a Profession
Unit 2: Memory Improving Techinques
Unit 3: Stress and Emotional Management
Unit 4: Personality Development

Block 2: Applications of Psychology-II

Unit 5: Psychology in Educational Settings
Unit 6: Psychology in Health Setting
Unit 7: Psychology in Organizational Setting
Unit 8: Adjustment to Family and Work Place

References:

1. Charles G.Morris. Albert A. Maisto Psychology an Introduction , Prentice Hall. New Jersy.
2. Feldman, A. R.,Understanding Psychology IV th Ed, 1996, McGraw Hill, New Delhi.
3. Morgan, King, Weisz &Schopler, Introduction to Psychology-V11 Ed,1993, Tata McGraw Hill, New Delhi.
4. Ernest R Hilgard, Richard C Atkinson ,Rita L Atkinson Introduction to Psychology Oxford Publication, New Delhi.

DEPARTMENT -INFORMATION TECHNOLOGY

ELMIT –02 E-Commerce (2 Credits)

Block 1:Fundamentals of E-commerce

Unit 1 : Introduction to E-commerce

What Is E-commerce? The Difference Between E-commerce and E-business, Technological Building Blocks Underlying E-commerce: the Internet, Web, and Mobile Platform, Major Trends in E-commerce, Unique Features of E-commerce Technology

Unit 2 : Types of E-commerce:
Business-to-Consumer (B2C) E-commerce, Business-to-Business (B2B) E-commerce. Consumer-to-Consumer (C2C) E-commerce, Mobile E-commerce (M-commerce), Social E-commerce, Local E-commerce E-commerce: A Brief History, Understanding E-commerce: Organizing Themes, Academic Disciplines Concerned with E-commerce

Unit 3 : E-Commerce Infrastructure
The Internet, Technology Background , Internet – Key Technology concepts, TCP/IP, IP addresses, Domain names, DNS and URLs, Client Server Computing, Cloud computing model, Mobile platform

Unit 4 : Internet and Web
Hypertext, HTML, XML, Web servers and clients, Web browsers, Communication tools – E mail, messaging apps, online message boards, Internet Telephony

Block 2: Construction of E-commerce presence
Unit 5: E-commerce presence – Building an e-commerce idea, Systematic approach, Choosing software and hardware, E-commerce site tools
Unit 6: E-commerce security E-commerce System environment, Security threats, Technology solutions
Unit 7: **E-commerce payment systems** : Management policies, E-commerce payment systems, Electronic billing presentment and payment
Unit 8: **E-commerce Business Strategies** : E-commerce business models, Major B2C Business models, B2B Business models,

References:

1. Laudon, Kenneth C., and Carol Guercio Traver. *E-Commerce 2020-2021*. Pearson, 2020.
2. Laudon, Kenneth C., and Carol Guercio Traver. *E-commerce Essentials*. Pearson, 2014

DEPARTMENT - BOTANY

Plant Diversity and Human Welfare

Plant Diversity and its Scope Levels of biodiversity: Genetic, Species and Ecosystem; Agrobiodiversity and cultivated plant taxa and related wild taxa.

Values and uses of Biodiversity, Methodologies for valuation, Ethical and aesthetic values, Uses of plants; Ecosystem services.

Loss of Biodiversity Loss of biodiversity- causes and implications, Hot spots of biodiversity, extinction of species, projected scenario for biodiversity loss.

Management of Plant Biodiversity Organizations associated with biodiversity management, IUCN, UNEP, WWF, UNESCO, NBPGR; Methodology for execution;

Biodiversity legislation; Information management and communication.

Conservation of Biodiversity, Role of Plants in Relation to Human Welfare Conservation of genetic, species and ecosystem diversity,

In situ and ex situ conservation strategies, India's biodiversity and its conservation Social approaches to conservation,

Biodiversity awareness programmes, Sustainable development.

Importance of forestry their utilization and commercial aspects; Avenue trees; Ornamental plants of India; Alcoholic beverages; Fruits and nuts; Wood and its uses; their commercial importance.

References

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices.Oxford and IBH Publications Co. Pvt. Ltd. New Delhi
2. Singh, J.S., Singh, S.P. and Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Reddy, K.V. and Veeraiah, S. (2010). Biodiversity and Plant Resources. Aavishkar publication, New Delhi.
4. Heywood, V. H. and Watson, R. T. (1995). Global biodiversity and Assessment. Cambridge University Press.

DEPARTMENT –FOOD AND NUTRITION SCIENCE

OEL-2: NUTRITIONAL MANAGEMENT IN DISASTER CONDITIONS

BLOCK- I: NATURAL / MANMADE DISASTERS

Unit-1: Emergency Situations-Famine, Drought, Flood, Earthquake, Cyclone, War, Civil and Political Emergencies.

Unit-2: Nutrition in Emergencies, Nutritional Problems and Communicable Diseases.

Unit-3: Feeding Programs during Emergencies.

Unit-4: Assessment and monitoring of Nutritional Status and relief measures during emergencies.

BLOCK- I: NUTRITIONAL RELIEF AND REHABILITATION

Unit-5: Assessment of Food needs in emergency situations, Food Distribution Strategy, Local food rehabilitation.

Unit-6: Special Foods/ Rations for Nutritional Relief, Organizations for Mass Feeding/ Food Distribution, and Supplementary Feeding.

Unit-7: Transportation, Storage, Feeding Centres, Sanitation, Hygiene and Identifying Reaching the Vulnerable Group.

Unit-8: Public Nutrition Approach to Tackle Nutritional and Health Problems in Emergencies, food security.

REFERENCES:

Jaspars, S. & Young, H. (1996), General Food Distribution in Emergencies: from Nutritional Needs to Political Priorities. Good Practice Review 3. 1996. Relief and Rehabilitation Network, Overseas Development Institute. London.

Young H., Jaspars S., Brown R., Frize J. & Khogali H (2001), Food Security and Assessments in Emergencies: A Livelihoods Approach. Humanitarian Practice Network, Overseas Development Institute. London

Annexures-III

Model Question Paper

III Semester, M.Sc. in Environmental Science Examination, May 2015
ES 3.1: Water and Wastewater Treatment

Time: 3 Hours **Max. Marks: 80**

Instruction: *Answer all the sections.*

Section A

Answer any **FOUR** questions from the following **4 × 5 = 20**

1. List various objectives of water treatment.
2. Write your understanding on ‘Load’, ‘Flow’ and ‘Concentration’.
3. Explain how a ‘Flashmixer’ works in a water treatment facility.
4. Draw the cross-section of sludge drying beds and briefly explain the same.
5. Explain the differences between ASP and MBR.

6. Write short notes on wetlands.

Section B

Answer any **THREE** questions from the following **3 × 10 = 30**

7. Draw a neat flow sheet showing various units in a water treatment plant.
8. Briefly discuss different types of 'settling' of particles.
9. Explain water/wastewater quality parameter interlinkages.
10. Explain the functioning of septic tanks and Dispersion trenches.
11. Explain different methods for analytical analysis of sludge.

Section C

Answer any **TWO** questions from the following **2 × 15 = 30**

12. Write equations that apply to an Ideal Settling Tank.
13. Explain any two biological waste treatment methods in Wastewater Treatment.
14. With a neat flow diagram, explain the mechanism of 'Anaerobic Digestion'.
15. Explain various disinfection processes as applied to water and wastewater treatment.

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