DEPARTMENT OF ENVIRONMENTAL SCIENCES

CHOICE BASED CREDIT SYSTEM (CBCS)

(For undergraduate courses of B.A and B.Sc)

PROGRAMME / COURSE SPECIFIC OUT COMES (PSO)

The curriculum of Choice Based Credit System of B.A and B.Sc program in Environmental Science is designed to motivate undergraduate students to achieve the following program specific outcomes:

1. Creating the awareness about Environmental problems among students.
2. Imparting basic knowledge about the Environment and its allied problems.
3. Developing an attitude of concern for the environment.
4. Motivating students and public to participate in environment protection and environment improvement.
5. Acquiring skills to help the concerned individuals in identifying and solving environmental problems.
6. Enabling students to contribute at individual level to attain harmony with Nature.

SEMESTER-I

Course No: UESTS 104 **Theory: 45 Lectures**

Title: Environmental Studies -I

Credits: 02 Maximum Marks: 100 Duration: 2½ Hr. External Examination: 80 marks
Internal Assessment: 20 marks

Course Outcome: This course will help to articulate the interconnected and multidisciplinary nature of environmental studies, understanding the various component of our environment, status of natural resources reserves and strategies for biodiversity conservation.

SEMESTER-II

Course No: UESTS 204 Title: Environmental Studies-2

Credits: 02 Maximum Marks: 100 Duration: 2½ Hr. External Examination: 80 marks

Internal Assessment: 20 marks

Course Outcome: This course covers causes and concern of pollution in different spheres of environment, its ill effects on health and the detailed Laws and Acts mandatory to implement to keep environment clean and green.

SEMESTER-III

SKILL ENHANCEMENT COURSE IN ENVIRONMENTAL SCIENCES

Course No: UESTS 301 Title: Solid Waste Management Credit:02

Time of Examination: 2.0 hrs Marks:

Semester Examination: 40

Sessional Assessment: 10

LAB COURSE

(Internal Evaluation)

Course No: UESPS 302 Title: Laboratory Course Credit:2

Duration of Examination: 3.0 hrs Marks: 50

Course Outcome: Upon successful completion of this course, students will be able to :

1. To characterize the waste and apply the knowledge of laws for municipal solid waste management, for handling of biomedical wastes and for handling of plastic wastes.
2. To apply the knowledge of mathematics, science, and engineering for effective solid waste collection systems, for waste collection route optimization and for processing of solid waste.
3. To design composting systems, maintain and operate the aerobic and anaerobic composting process for effective organic waste recycling.

4. To manage construction and operations of landfill facilities, energy recovery systems.

SEMESTER-IV

SKILL ENHANCEMENT COURSE IN ENVIRONMENTAL SCIENCES

Detailed Syllabus

Course No: UESTS 401 Title : Environmental Impact Assessment (EIA) Credit:2

Time of Examination: 2.0 hrs Marks:

(a) Semester Examination: 40

(b) Sessional Assessment: 10

LAB COURSE

(Internal Evaluation)

Course No: UESPS 402 Title: Laboratory Course Credit:2

Duration of Examination : 3.0 hrs Marks: 50

Course Outcome: On successful completion of the course students will be able :

1. To critically examine assumptions inherent in impact assessment.
2. To develop skills in identifying and solving problems arises during various developmental projects
3. To provide students with the knowledge and professional skills necessary to enable them to undertake environmental impact assessment.
4. To familiarize students with a variety of professional tools used in predicting environmental impacts.
5. To encourage students to develop their own perspectives on impact assessment and to be able to relate this to other subject areas and to their wider understanding.

SEMESTER-V

SKILL ENHANCEMENT COURSE IN ENVIRONMENTAL SCIENCES

Detailed Syllabus

Course No: UESTS 401 Title : Environmental Pollution and Management Credit:2

Time of Examination: 2.0 hrs Marks:

(a) Semester Examination: 40

(b) Sessional Assessment: 10

LAB COURSE FOR SKILL ENHANCEMENT IN ENVIRONMENTAL SCIENCES

(Internal Evaluation)

Course No: UESPS 402 Title: Laboratory Course Credit:2

Duration of Examination : 3.0 hrs Marks: 50

Course Outcome: After completion of the course students will be able to identify the various sources of air, water, soil and noise pollution. Understand the factors involved in the causes of pollution and control measures.

EMESTER-VI

SKILL ENHANCEMENT COURSE IN ENVIRONMENTAL SCIENCES

Course No: UESTS 301 Title: Environmental Hazards: concept and management Credit:2

Time of Examination: 2.0 hrs Marks:

Semester Examination: 40

Sessional Assessment: 10

LAB COURSE FOR SKILL ENHANCEMENT IN ENVIRONMENTAL SCIENCES

(Internal Evaluation)

Course No: UESPS 402 Title: Laboratory Course Credit:2

Duration of Examination : 3.0 hrs Marks: 50

Course Outcome: Students will Identify, critically analyse and evaluate the inter-relating factors between the human and physical environments that result in vulnerability to natural environmental processes and understand the various management strategies used to manage environmental hazards and natural and manmade disasters for minimum loss of life and property.

DEPARTMENT OF ZOOLOGY

Learning outcomes of the programme

Zoology as a core subject in the curriculum of three year degree programme envisages at giving an advance knowledge about the various aspects of the animal life. The subject curriculum is designed in a very simple manner thereby giving all the required knowlede to a student for the better understanding of animal life including humans. It includes the identification of organisms, their morphological features, anatomical features, physiology, biochemistry,evolution etc. In addition to this the programme also includes the applied part of the subject. This program is one of the most fundamental unit of basic sciences studied at undergraduate level. The program helps to develop scientific tempers and attitudes, which in turn can prove to be beneficial for the society since the scientific developments can make a nation or society to grow at a rapid pace. After studying this program, students will bemore equipped to learn and know about different biological systems,their coordination and control as well as evolution, behavior and biological roles of the animals in the ecosystem.this will provide them ample opportunities to explore different career avenues. The program will also provide a platform for classical genetics in order to understand distribution or inheritance of different traits and diseases among populations

COURSE SPECIFIC OUTCOMES

THEORY

The detailed course specific outcomes are as below

SNO.	TOPIC	OUTCOME
1	Animal diversity	This includes the intitiational topics covering studying, identifying and classifying the different organisms. With this part students are able to learn about the various categories of animals covered under the headings of non chordates and chordates. It also includes the type study of some organism groups their characteristics and classification in general and some peculiar features of the same as well.
2	Comparative anatomy and developmental biology of vertebrates	The anatomical details of the chordates are studied in a comparative manner in order to have the comparative knowledge about the animals. It also focuses on the developmental biology of the organism. The animals studied in the comparative manner ie the comparative account of each and every physiological activity of various groups are studied so as to identify the changes coming across during the progression and evolution of the organisms.
3	Physiology and Biochemistry	The student learns about the various physiological processes working in the vertebrates. This part also includes the basic concepts of biochemistry
4	Principl of genetics and evolutionary biology	It deals with basic concepts cell biology, genetics and evolutionary aspects of the animals.
5	Applioed zoology	It includes the applied part of zoology like biotechnology, aquaculture, apiculture, lac culture,sericulture and parasitilogy. Students learn details about taxonomy and biology of

		fishes as well as various aquaculture techniques in details. It enhances the knowledge of the various applied parts of the subjects including the various culture techniques thus giving a preliminary knowledge to them about the entrepreneurial ideas using such culture techniques.
6	Insect vectors and pest management	The students learn about the taxonomy of the various insects which are of economical importance to man.

Practical

After the theoretical concepts of each course item the students are give practical knowledge of the same. It includes the identification of the animal groups, biochemical analysis, physiological analysis, insect vectors identification, identification of the locally available faunal elements and so on. Annual visits are also conducted to give the ground reality of all the culture techniques and animal husbandry.

SKILL ENHANCEMENT COURSES

In addition to this the department also runs two skill courses apiculture and aquarium fish keeping which are the skill enhancement courses. As the name itself indicates these courses focus on the skill development of the students with this applied part of the subject thereby enhancing their vision towards self employment.

After the completion of this course, students have the option to go for higher studies, i.e., M. Sc. / Integrated MSc Ph.D. and then do research work for the welfare of mankind. After higher studies, students can join as scientist or assistant professor or assistant teacher and can even look for professional job oriented courses, such as Indian Civil Services, Indian Forest Service, Indian Police Service etc. Science graduates can go to serve in industries or may opt for establishing their own industrial unit. Practical and theoretical skills gained in this program will be helpful in designing different public health strategies for social welfare. The program has been designed to provide in-depth knowledge of applied subjects ensuring the inculcation of employment skills so that students can make a career and become an entrepreneur in diverse fields. After the completion of the B.Sc degree there are various other options available for the science students.

DEPARTMENT OF CHEMISTRY

CHOICE BASED CREDIT SYSTEM

PROGRAMME/ COURSE SPECIFIC OUT COMES (PSO)

The curriculum of Choice Based Credit System of B.Sc. program in Chemistry is designed to motivate undergraduate students to achieve the following program specific outcomes:

1. To enable the students to model, simulate and validate the basic concepts related to different branches of Chemistry.
2. To practice and solve numerical problems and also to understand the mechanism of some basic organic reactions.

3. To develop communication and other skills for use in a wide range of industrial areas.
4. To understand the basics of, for example, analytical techniques, detections of elements, gravimetric and volumetric analysis, simple spectroscopic techniques, etc.

SEMESTER-I

Course No.: UCHTC101 Theory: 60 Lectures

Title: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: This course will help to understand the aspects of atomic structure, bonding involved, molecular structure, etc. The fundamentals of organic chemistry coupled with basic stereochemistry are introduced in this semester.

Course No.: UCHPC102 Title: Laboratory Course; Chemistry-I

Maximum Marks: 50 Credits: 02 Duration: 4 hours

Course Outcome: The students will be trained in volumetric analysis, detection of elements and separation of mixtures by chromatography. Use of paper chromatography as a separation technique will be an additional advantage

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SEMESTER-II

Course No.: UCHTC201 Theory: 60 Lectures

Title: CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: This course covers principles of thermo chemistry, thermodynamics and chemical/ionic equilibrium. The basic fundamentals of organic chemistry and aliphatic as well as aromatic hydrocarbons will help the students in laying the foundation for the advance studies of organic chemistry

Course No.: UCHPC202 Title: Laboratory Course; Chemistry-II

Maximum Marks: 50 Credits: 02 Duration: 4 hours

Course Outcome: The practical component involves some theoretical aspects studied in this semester in the form of practical shape. The experiments on thermochemistry, purification and preparation of organic compounds will create confidence amongst the students.

SEMESTER-III

Course No.: UCHTC301 Theory: 60 Lectures

Title: SOLUTIONS, PHASE EQUILIBRIUM, CONDUCTANCE, ELECTROCHEMISTRY & FUNCTIONAL GROUP ORGANIC CHEMISTRY

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: The ideas of solutions, phase equilibrium, conductance, electrochemistry from Physical Chemistry and aliphatic/ aromatic acids, amino acids, peptides, proteins, carbohydrates from Organic Chemistry will be dealt in details.

Course No.: UCHPC302 Title: Laboratory Course; Chemistry-III

Maximum Marks: 50 Credits: 02 Duration: 4 hours

Course Outcome: The experiments on distribution, law, conductance, potentiometer, qualitative analysis of organic compounds will be conducted.

Course No.: UCHTS303

Title: COSMETICS, PERFUMES AND MEDICINAL AGENTS FROM NATURAL SOURCES (Skill Enhancement Course)

Credits: 04 Maximum Marks: 100 Duration: 2½ hours External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: The skill enhancement course in 3rd semester will help the students to know the products used in daily life. The brief practical training regarding preparation of talcum powder, shampoo, enamels, face cream hair remover, etc. will form the highlights of this course.

SEMESTER-IV

Course No.: UCHTC401 Theory: 60 Lectures

Title: COORDINATION CHEMISTRY, STATES OF MATTER & CHEMICAL KINETICS

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: This course consists of some parts from Inorganic Chemistry and some parts of Physical Chemistry. Good familiarity with transition elements, coordination chemistry and crystal field theory will help the students to develop interest in the advanced areas of this

study. The Physical Chemistry section deals with states of matter, namely, solids, liquids and gases. Additionally, basic kinetic studies are introduced in this section.

Course No.: UCHPC402 Title: Laboratory Course; Chemistry-IV

Maximum Marks: 50 Credits: 02 Duration: 4 hours

Course Outcome: The students will be involved in analyzing salts qualitatively along with quantitative estimation. They will also be trained in the experiments in solution chemistry as well as in determining the order of reaction.

Course No.: UCHTS403

Title: PESTICIDE CHEMISTRY (Skill Enhancement Course)

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: It is a skill enhancement course which deals in pesticide chemistry useful for agricultural purposes.

SEMESTER-V

Course No.: UCHTE501 Theory: 60 Lectures

Title: SPECTROSCOPY, PHOTOCHEMISTRY AND ORGANO METALLICS AND BIOINORGANIC CHEMISTRY Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: The course deals in Chemistry of 3d elements, organometallic compounds and bioinorganic chemistry. The fundamentals of molecular spectroscopy will help in understanding the molecular spectroscopy.

Course No.: UCHPC502 Title: Laboratory Course; Chemistry-V

Maximum Marks: 50 Credits: 02 Duration: 4 hours

Course Outcome: The lab course involves some experiments based on instrumentation.

Course No.: UCHTS503

Title: FUEL CHEMISTRY (Skill Enhancement Course)

Credits: 04 Maximum Marks: 100 Duration: 2½ hours External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: It is also skill enhancement course which deals in coal, petroleum products, Fuel Chemistry, lubricants, etc.

SEMESTER-VI

Course No.: UCHTE601 Theory: 60 Lectures

Title: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE AND ORGANIC SPECTROSCOPY

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: The study of inorganic materials of industrial importance and study of UV/Visible and NMR Spectroscopy of simple organic compounds forms the foundations of this course.

Course No.: UCHPC602

Title:- Laboratory Course: Chemistry-VI

Maximum Marks: 50 Credits: 02 Duration: 4 hours

Course Outcome: The experiments on analysis of industrial products, including cement, fertilizers, pigments and preparation and spectroscopic study of simple organic compounds will be covered in the course.

Course No.: UCHTS603

Title: GREEN METHODS IN CHEMISTRY (Skill Enhancement Course)

Credits: 04 Maximum Marks: 100 Duration: 2½ hours

External Examination: 80 marks Internal Assessment: 20 marks

Course Outcome: Skill development course in which usefulness of green methods in chemistry will be discussed.

Department of English

Programme Outcomes

- Developing intellectual, personal and professional abilities through effective communicative skills; ensuring high standard of behavioral attitude through literary subjects and shaping the students socially responsible citizens.
- On successful completion of the programme, the students are introduced to communicative skills, to define, classify and understand the methods of communication, to improve their LSRW skills, to enable them to practice those skills in their daily life.

Programme Specific Outcomes

- On successful completion of the programme, the students will be accurate both in oral and written communication as they will be strong in Grammar and its usage.

● The students can express a thorough command of English and its linguistic structures.

● The students will be familiar with the textual genres including fiction, non–fiction, poetry, autobiography, biography, journal, plays, editorials etc.

Course Outcomes

● On successful completion of the programme, the students are introduced to communicative skills, to define, classify and understand the methods of communication, to improve their LSRW skills, to enable them to practice those skills in their daily life.

● To gain knowledge on fundamental principles of English grammar including parts of speech, sentence types (simple/compound/complex sentences), subject-verb agreement, pronoun usage, punctuation etc.

● To learn the literary, societal, cultural and historical background of the greatest English writings penned by Indian Authors

● To familiarize students with the literary texts of ancient and modern literature written by great writers of English.

● To obtain adequate information on colonization and post- war consequences through the literary, cultural biographical and historical background of the greatest writings in Commonwealth literature.

Department of Physics

Programme Outcome

● Physics is a branch of science that studies matter and its motion through space and time, along with related concepts such as energy and force. Physics is one of the fundamental sciences because the other natural science deal with systems that seems to obey the law of

Physics. According to Physics, the physical laws of matter, energy and the fundamental forces of nature govern the interactions between particles and physical entities (such as plants, molecules, atoms or the subatomic particles). Physics deals with a wide variety of systems, certain theories are used by all

- physicists. Each of these theories were experimentally tested numerous times and found to be an adequate approximation of nature. Physics uses mathematics to organize and formulate experimental results and from
- which new predictions can be made. The results from physics experiments are numerical measurements. Technologies
- based on mathematics, made computational physics as active area of research.

Programme Specific Outcome

The theory of classical mechanics accurately describes the motion of objects,

- provided they are much larger than atoms and moving at much less than the speed of light.
- To provide the detail study of atom and the behavior of atom in various states

Course Outcomes

The students will demonstrate a scientific knowledge of the core physics principles in Mechanics, Electromagnetism, Modern Physics and Optics The student will determine the appropriate level of technology for use in experimental

- design and implementation, analysis of experimental data and numerical and mathematical methods in problem solutions The students will demonstrate a purposeful knowledge of scientific literature and
- ethical issues related to physics The students will effectively communicate their knowledge of physics from basic
- concepts to specific detailed presentations through a variety of oral, written and computational modalities To acquire the basic knowledge of mechanics, properties of matter and gravitation
- Learn motion of bodies and sound waves
- To inspire interest for the knowledge of concepts in physical and geometrical physics

Department of Botany

Programme Outcome

To inculcate in students the scientific study of plants which in learn is used in many aspects of human life. Plants being necessary for supporting all life forms on earth, either directly or indirectly. Its study helps in better understanding of our selves at the cellular and genetic level.

Course Outcomes

- Students will be able to define and explain major concept in the biological sciences.
- It will helps the student to use biological instruments in proper and correct way.
- It will enable the students to explain and apply the scientific method including designing and conducting experiments and testing hypotheses.
- Students will be able to communicate biological knowledge in oral and written for.

Department of Mathematics

Course Outcomes

Demonstrate basic manipulative skills in algebra, geometry, trigonometry and beginning calculus. Apply the underlying unifying structures of mathematics and the relationships among them. Demonstrate proficiency in writing proofs.

- Investigate and apply mathematics problems and solutions in a variety of contexts related to science, technology, business and industry and illustrate these solutions using symbolic, numeric or graphical methods. Students can understand the foundation of Mathematics.
- They are able to perform basic computation in higher Mathematics.
- Students are able to develop problem solving skills. They are able to communicate Mathematical ideas with others.
- They can enhance the quality of analysis and research in different mathematical fields. Operations

research can develop the management quality in different industries and factories.

Department of Economics

Programme Outcome

● A degree in economics provides you with a solid foundation for a carrier in business, government or with the nonprofit organization. In this programme you will study how societies, governments, households and individuals create, use, manage and distribute resources.

Course Outcomes

● Understand the behavior of Indian and world economy.

● To develop the financial literacy for profitable investment.

● To make students aware of the issues of inflation, unemployment, poverty, GDP and Balance of payment.

● It develop the skill to make better decisions in business environment and even in your personal choices.

● To impart the knowledge of Banking, Marketing and different sections of economy so that students will get job opportunities in different economic, financial, banking, marketing and other sections of economy.

● Economists are vital in helping, predict and study responses to changes in policy and market changes, which is an important skill in today's changing business environment.

● Economists also study and help in developing public policies like health care and educational reforms.

Department of History

Programme Outcome

● The Bachelor of Arts in History is a broad- based programme that has specific goals, including : engaging the mind and imagination of those who study history ; introducing students to worlds, times, places and cultures including their own in a way that they have never thought before Course Outcomes

● To create interest towards the cultural and historical background of India.

● To understand the various historical incidents and to help students for preparing competitive examination.

● To help the students to identify and evaluate conflicting interpretations.

● It inspire the students through bravery and courage of our forefather.

● It inculcates critical thinking, reading, writing and research skills among students.

Department of Political Science

Course Outcomes

●It understands inspires political philosophy, ideologies and the nature of Indian Constitution.

●Comparative study of international politics and role of women in politics.

●It understand the students different types of Government and their policies.

●It helps the students to understanding responsibilities and rights of the citizens of a country.

●It helps the students what is happening in the countries around the world, issues the people are facing or new laws are being implemented.

●It understand the structure and working of the state, the separation of power, the judicial and legal system, scheme of welfare and social services.

Department of Geography

Course Outcomes

●It develop the skills including critical thinking, problem solving, reasoning, analysis, interpretations and synthesizing information's and communication literacy, media and internet literacy, data interpretation and analysis and computer programming.

●It imparts the knowledge about different places on earth and how they relate with each other.

●It help the students to identify and appreciate important events and National and International policies; make better and informed decisions regarding the best use of National resources.

●It help the students to know about the relationship between human being and the environment and the general process of natural resources.

●It enable the students to understand how population growth and technological advances affect the environment.

●It help the students to gain the understanding of International mattes and multicultural concerns, read maps, interpret local and global information and understand International networks for trade.