Re-Accredited 'B++' 2.86 CGPA by NAAC
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-: પરિપત્ર :-

વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન Zoology કોર્સ ચલાવતી તમામ કોલેજોનાં આચાર્યશ્રીઓ તથા ડિપાર્ટમેન્ટનાં વડાશ્રીને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૨–૨૩ થી અમલમાં આવનાર શૈક્ષણિક વર્ષ ૨૦૨૨–૨૩ થી અમલમાં આવનાર M.Sc. Zoology Sem-2 નો NEP-2020 પ્રમાણેનો અભ્યાસક્રમ તૈયાર કરતા પ્રાણીશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૦૫/૧૨/૨૦૨૨ ની સભાનાં ઠરાવ ક્રમાંકઃ૨ અન્વયે કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિજ્ઞાન વિદ્યાશાખા વતી વિજ્ઞાન વિદ્યાશાખાનાં અધ્યક્ષશ્રી એ મંજૂર કરી એકેડેમિક કાઉન્સિલને ભલામણ એકેડેમિક કાઉન્સિલ તા.૧૪/૧૨/૨૦૨૨ ની સભાનાં ઠરાવ ક્રમાંકઃ૦૨ થી સ્વીકારી મંજૂર કરેલ છે. જેની આથી જાણ કરવામાં આવે છે.

પ્રાણીશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૦૫/૧૨/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંકઃ૨

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૨–૨૩ થી અમલમાં આવનાર M.Sc. Zoology Sem-2નાં પ્રાણીશાસ્ત્ર વિષયનો અભ્યાસક્રમ મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૧૪/૧૨/૨૦૨૨ની ઠરાવ ક્રમાંકઃ ૩૧

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૨–૨૩ થી અમલમાં આવનાર M.Sc. Zoology Sem-2 નો NEP-2020 પ્રમાણેનો અભ્યાસક્રમ તૈયાર કરતા પ્રાણીશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૦૫/૧૨/૨૦૨૨ ની સભાનાં ઠરાવ ક્રમાંકઃ૨ અન્વયે કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખા ની મંજૂરીની અપેક્ષાએ વિજ્ઞાન વિદ્યાશાખાવતી વિજ્ઞાન વિદ્યાશાખાનાં અધ્યક્ષશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ સ્વીકારી મંજૂર કરવામાં આવે છે.

(બિડાણઃ ઉપર મુજબ)

ક્રમાંક : એસ./ Zoology/સિલેબસ/પરિપત્ર/૩૦૩૬૬/૨૦૨૨
તા.૧૯–૧૨–૨૦૨૨

19/12/22
કુલસચિવ

પ્રતિ,

૧) વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન Zoology વિષયનો અભ્યાસક્રમ ચલાવતી તમામ કોલેજોનાં આચાર્યશ્રીઓ. તથા ડિપાર્ટમેન્ટનાં વડાશ્રી. .....આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારૂ.
૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
૪) અનુસ્નાતક વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....તરફ જાણ તેમજ અમલ સારૂ.

M.Sc.Sem-2
Proposed Syllabus

E. G. – ZOO – 2004 - MARINE BIOLOGY
OR
E. G. – ZOO – 2004 -APPLIED MICROBIOLOGY

E. G. – ZOO – 2004
MARINE BIOLOGY

15 Hrs (each unit)

Objective

The main objectives of this course are:

Acquire basic knowledge of ecological and economic importance of marine flora and fauna, understand marine biodiversity and its conservation strategies, study the pharmacological importance of marine organisms as well as various threats for marine life.

Desired Outcome

On the successful completion of the course, student will be able to:

- Define about oceanography
- Assess the ecological and economic importance of marine life
- Explain the significance of marine biodiversity and its conservation
- Identify the pharmacological significance of marine organisms

Unit:1 Oceanography

1.1 Marine environment

1.1.1 Physical oceanography: measurements of waves, tides and currents

1.1.2 Chemical oceanography: Nutrient cycle, minerals and trace elements

1.2 Biological oceanography: microbes, phytoplankton, finfish and shellfish resources

Unit:2 Marine Biodiversity

2.1Marine flora: microalgae, saltmarshes, seaweeds, sea grasses, mangroves and their ecological importance

2.2 Marine fauna- Zooplankton- sponges, worms, crustaceans, molluscs, Pisces, birds and mammals

2.3 Role of artificial intelligence in marine diversity.

Unit:3 Conservation of Marine Animals

3.1 Conservation of marine life (In-situ and Ex-situ conservation)

3.2 Conservation of coral reefs

3.3 IUCN and its importance- Sea ranching

3.4 Marine biosphere reserves of India- Marine parks

3.5 Island Biodiversity-Invasive species

Unit:4 Marine Pharmacology

4.1 Bioactive compounds

4.2 Bioactive compounds from bacteria, microalgae, seaweeds, sea grass and invertebrates and vertebrates

4.3 Bioactive compounds for antibacterial, antifungal, antiviral, anti-inflammatory and anticancer activities

Reference Books

1. Pillai N.G.K. 2011. Marine fisheries and mariculture in India. Narendra Publishing House, India
2. Barnes (Harold) ED. Ocenography and Marine Biology, volume 2-7.
3. Dubey (S K). Marine biology. Dominant Publishers
4. Castro(Peter); Huber(Michael.E). Marine biology, 2nd edition.
5. Ormond (Rupert FG); Gage (John D). 1997. Marine biodiversity. Cambridge Press.
6. Marshall (N.B) ED.1969. Aspects of marine zoology.
7. Harrison(Richard. J); King (Judith. E). 1965. Marine mammals. Hutchinson University Library press
8. Zottoli (Robert). Introduction to marine environments.
9. Scheuer (Paul J), ED. Marine natural products. Academic Press
10. Briggs (John. C). 1974. Marine Zoogeography. Mcgraw Hill Press.
11. Howard (Edwin.B) ED., 2000. Pathobiology of marine mammal diseases vol-II. CRC Press.
12. Bal (D.V); Rao(K.V). 1984. Maine fisheries. TATA - Mcgraw Hill Publishers
13. Vernberg (Winona.B) ED. Marine pollution. Academic Press.
14. Steidinger (Karen. A); Walker (Linda.M) ED. Marine plankton life cycle strategies. CRC Press.
15. Axelrod (Herbert. R). Exotic marine fishes.

E. G. – ZOO – 2004
APPLIED MICROBIOLOGY

15 Hrs (each unit)

Objectives

The main objectives of this course are to:

Know the structure, functions and classification of bacteria, viruses, fungi and yeast. apply knowledge on the Cultivation and control of microorganism, understand the distribution of microorganisms, learn about the microorganisms and their detection, understand the application of microorganisms in microbial technology.

Expected Outcomes

On the successful completion of the course, student will be able to:

- Identify the scope and history of microbiology.
- Acquire the knowledge on cultivation and control of microorganisms.
- Apply knowledge on the role of microorganism in cycling of nutrient
- Analyze the different applications of microbiology in food industry.

Unit:1 Scope and history of microbiology

1.1 Classification of bacteria, fungi, yeast and virus.
1.2 Structure and functions of bacteria and virus.
1.3 Reproduction in bacteria – Transformation, conjugation, transduction
1.4 Mapping in bacterial genomes.
1.5 Global impact of Covid19 pandemic.

Unit:2 Cultivation and Control of Microorganism

2.1 Methods of collection of sample – methods of estimation of microorganism in soil, water and air
2.2 Isolation and identification of bacteria.
2.3 Methods of sterilization and disinfection: Microbial control, Physical and chemical, techniques of pure culture.
2.4 Method of cultivation of bacteria, Phases of growth.

Unit:3 Microbial Ecology

3.1 Distribution of microorganism in soil, water and air.
3.2 Role of microorganisms in the cycling of nutrients
3.3 Carbon, nitrogen, phosphorous and sulphur cycle.

Unit:4 Food Microbiology

4.1 Sources, types incidence of microorganism in vegetables, meats, poultry, seafood and dairy products
4.2 Spoilage of food, fruits, vegetables, meat, poultry, seafood, caned products.
4.3 Factors influencing spoilage.
4.4 Methods of detection of spoilage, principles of food preservation and prevention of food spoilage.

Reference Books

1. Ananthanarayan and Paniker's Textbook of Microbiology Edited by Paniker C.K.J. 2005 (VII edt.).The Orient Blackswan.
2. A Textbook of Microbiology by Dubey, R.C. and Maheshwari, D.K. 2007. S. Chand and Company Ltd.
3. General Microbiology by Stanier (Roger.Y) and Ingraham (John. L). 1992. Published by Macmillan
4. Cellular Microbiology by Cossart (Pascale) and Boquet (Patrice). 2000. ASM Press.
5. Medical Microbiology by Rajan S. 2007. MJP Publishers
6. Manual of Microbiology by Kanika Sharma. 2007. Anshan Ltd.
7. Environmental Molecular Microbiology by Paul Rochelle, A. 2001. Horizon Press
8. A Text Book of Soil Microbiology by Agarwal, T.K. 2014. Astha Publishers and Distributors
9. Food Microbiology by Frazier, W.C. 1988. McGraw-Hill Inc.,US

ZOO – 2006 (Skill Based Elective Paper)

Instrumentation and Techniques

Total 30Hrs

Objective

The main objective of this paper is to introduce and aware students about laboratory instrumentations and its techniques that help to further study the presence of molecules and separation as well as identification of molecules.

Desired Outcome

The learner will knowledge regarding concept of potentiometry and its uses. Students will get idea about cell separation on the bases of particle size, molecular weight etc. Students will get knowledge about Lambert's Beers Law and its uses in different instrumentations. They will information about sophisticated chromatographic techniques and its applications.

Unit 1: Potentiometryand Chromatography 15 Hrs

1.1 Types of electrodes: pH Electrode, Reference Electrode, Glass Electrode, Combined Electrode, Ion selective meter and Maintenance of electrode

1.2 Paper chromatography: Types and Preparation Technique
Gas Chromatography: Introduction andapplications, Instrumentation- carrier gases, types of column, Stationary phaseand Detectors in GLC and GSC

Unit 2: Colorimeter & Spectrophotometer15 Hrs

2.1 Derivation of Lambert's Beers Law

2.2 Colorimeter – Instrumentation, Components, application

2.3Principles, instrumentation and applications

- 2.3.1 Infrared Spectroscopy
- 2.3.2 fluorescence Spectroscopy
- 2.3.3 NMR
- 2.3.4 Mass Spectroscopy

Reference books:

1. Bisen& Mathew - Tools and Techniques in Life Sciences – CBS Publishers & distributors.
2. Robert Braun - Introduction to Instrumental Analysis. McGraw Hill International Editions
3. Wilson and Walker – Principles and Techniques of Practical Biochemistry. Cambridge Univ. Press.
4. Skoog and West-Principles of Instrumental Analysis.
5. Campbell and Dwek-Biological Spectroscopy.