MES Asmabi College, P Vemballur

DEPARTMENT OF AQUACULTURE

Proposal for the Certificate Course 2022-23

CERTIFICATE (VALUE – ADDED) COURSE IN

MARINE POLLUTION AND TOXICOLOGY

Department. : AQUACULTURE

Name of the Course : **Marine Pollution and Toxicology**

Course Code . : CC22MPAT

Name of the Coordinator : Dr. Dhanya P R (9447467982,dhanyapulikkottil@gmail.com)

Head of the Department : Dr.Kesavan K (9495247407, kknambudiri@gmail.com)

Maximum number of students

(Intake Capacity) : 45

Duration of the course : 30 hrs

Level : UG

Teaching Methodology :

1. Direct: ICT integrated Classroom Teaching including Virtual Labs.
2. Indirect: Participative - Virtual study groups and group discussions.

Teaching Aids : PPT, Videos, Case studies, Handouts, Links to web resources, Virtual Labs and Virtual Tours.

Evaluation procedure : Total Marks: 100 (Test: max. 80 Marks, Attendance: 20 Marks)

The assessment involves written tests accommodating MCQ and short answer questions. Attendance in classes will be given due weightage. A minimum of 50% of marks in written tests is required for a pass. Minimum of attendance fixed is 75%.

Collaborating agency, if any : Nil

Project, Assignment, Internship : Nil

Date of Registration : 17/08/2022

Tentative date of Course Completion : 17/12/2022

Date of final examination : 31/12/2022

Date of Issue of Certificate : 07/01/2023

Course fee : Rs. 400/-

Overview of the Course:

Land-based sources account for the 82% of the total marine pollution. Pollution from vessels can take the forms of oil, chemicals, lost cargo and equipment, sewage, garbage, fumes and invasive exotic species. Dumping is the deliberate disposal of wastes at sea. Offshore activity generates minor pollution primarily through the use of oily drilling muds and by production blow outs. This course introduces the participants to the various aspects of marine pollution, and international rules and regulations pertaining to it. Direct and indirect hazards to organisms including humans due to pollution are covered.

Aquatic environments are increasing becoming receptacles for varied kinds of pollutants. The contents of the curriculum of this course are not a part of regular curriculum set by the affiliating University. Hence the course shall be supportive to all students of the college as a value added course enhancing environmental consciousness.

Course Outcome: At the end of this course, you will be able to:

1. Define and distinguish different sources of marine pollution.
2. Aware of hazards due to aquatic pollution.
3. Identify global and regional agreements and initiatives addressing marine pollution.
4. Practice and advice do's and don'ts related to protection of aquatic environment.
5. Suggest mitigation measures for pollution and toxic effects.

Course Syllabus

MODULE 1 **6 Hrs.**

Marine Pollution-definition- role of GESAMP- major pollutant- sources, transport path, dynamics. Toxicology- lethal and sub lethal effects of pollutants to marine organisms- bioconcentration, bioaccumulation and biomagnifications. Factors influencing toxicity- synergistic and antagonistic effects.

MODULE 2 **6Hrs.**

Sewage pollution – industrial, agricultural and domestic impact on marine environment, treatment methods. Detergents- composition- eutrophication and ecological significance- Plastics and Litter source and impact in the marine environment.

MODULE 3 **6Hrs.**

Heavy Metal pollution- sources, distribution, and fate. Pesticide pollution classification, sources, distribution, fate and ecological impacts with special reference to marine fishes, birds and mammals.

MODULE 4 **6 Hrs.**

Oil Pollution- composition, sources, biological impacts on fishes, birds, mammals, . treatment techniques. Thermal pollution- sources - uses of waste heat role of biocides, chlorine ecological impacts. Radioactive pollution- sources (natural and artificial) biological effects of radiation.

MODULE 5 **6 Hrs.**

Environmental monitoring methods for critical pollutants-objectives status limitations- biological indicators - natural bioaccumulations (mussel watch water quality assessment. Use of analytical instruments AAS, ICP, GLC, Spectrofluorometer for analyzing Petroleum hydrocarbon, Pesticides, Heavy metals etc.

References:

1. Clark R.B 1992. Marine pollution 3rd edition Clavendron, Press Oxford.
2. Williams 1996. Introduction to Marine Pollution Control. John Wiley.
3. Michael J. Kennish 1994. Practical Handbook on Estuarine and Marine Pollution.
4. Johnston, R. (ed), 1976. Marine Pollution, Academic Press, London.
5. Goldberg, E. D. 1974. The Health of the oceans, UNESCO Press. Paris.
6. Park, P .K, Kester D.R., J.W. Deudall and B.H Ketchum, 1983. Wastes in the Ocean. Vols. 1 to 3. Wiley Interscience Publishers, New York.
7. GESAMP http://www.gesamp.org/
