Module Title: MARITIME ENVIRONMENTAL MANAGEMENT

- **Type of Module:**

NA0002	Elective Stream Module

- **Level of Module**

  Postgraduate

- **Year of Study** MASTER’S
- **Semester** Spring Semester 2nd period
- **Number of credits allocated** 3
- **Name of lecturer / lecturers : Anna Maria Kotrikla**
- **Description:**

This course examines the effects of shipping on the environment and the regulatory and policy framework for the mitigation of the effects. At first there is a historical overview on the development of environmental awareness in shipping, placed within the overall context of environmental awakening, from 1950 until today. The role of various actors (flag states, coastal states and international organizations, associations of ship-owners and cargo owners, classification societies, insurers, non-governmental organizations) is critically analyzed. The evolution of the precautionary principle is discussed. Then specific issues are presented, starting from oil pollution, sewage, garbage and hazardous cargoes to air pollution, anti-fouling paints, ballast water management and ship recycling. Finally, environmental managements systems for ports are presented. The course focuses on the regulatory and policy work of the International Maritime Organization and European Union. The ultimate challenge of the course is the student to be able to recall and apply the principles and provisions of the environmental management in maritime matters either in his/her academic activity or in his/her professional career.

- **Prerequisites: N/A**

- **Module Contents (Syllabus):**

1. Historical overview of policy development in the maritime sector in relation to the general milestones of environmental policy. The role of various actors (flag states, coastal states and international organizations, associations of ship-owners and cargo owners, classification societies, insurers, non-governmental organizations). The role of major accidents in the early work of IMO and the evolution of the precautionary principle.

2. Specific issues on shipping and the environment:

- Oil pollution: Oil inputs in the marine environment. The fate and toxicity of oil in the marine environment. Response to oil spills. Case studies (the accidents of Exxon Valdez, Sea Empress, Erika and Prestige). Annex I of MARPOL 73/78 (International Oil

Pollution Prevention Certificate, Special Areas under MARPOL 73/78, provisions for oil discharges within and outside special areas, waste reception facilities in ports, provisions for tankers - segregated ballast tanks, clean ballast tanks, crude oil washing, inert gas systems, double hull).

- Pollution by hazardous cargoes, wastes, garbage. Annexes II-IV of MARPOL 73/78.
- Antifouling systems. Conventional and copolymer paint systems. Paints containing TBT. Toxicity and fate of TBT in the marine environment. Booster biocides and alternative methods for the protection of hull without the use of toxic substances. The International Convention on the Control of Harmful Anti-fouling Systems on Ships of IMO.
- Atmospheric pollution. Contribution of shipping: SO_2, NOx, soot. Annex VI of MARPOL 73/78 for the Prevention of Air Pollution from Ships. Greenhouse effect, the United Nations Framework Convention on Climate Change and the Kyoto protocol. The contribution of different modes of transport to the greenhouse effect and the relevant policy development by the IMO.
- Ballast water management. The introduction of alien species in ballast water of ships. The International Convention for the Control and Management of Ships‘Ballast Water and Sediments of IMO.
- Environmental management in ports. Atmospheric pollution. Marine pollution. Noise. Waste reception facilities. Port State Control. Environmental management systems.
- Ship recycling. Management of dangerous materials. Development of the relevant IMO/ILO policies and instruments.

Language of instruction / Γλώσσα διδασκαλίας

Greek

Name and contact info of lecturer / Στοιχεία διδάσκοντα

Name: Anna Maria Kotrikla
Position: Lecturer
Email: akotr@aegean.gr

Expected learning outcomes / Μαθησιακοί στόχοι

The student will come in contact with an interdisciplinary subject that combines aspects of environmental science and principles of management and administration. With the successful completion of the course, students will be aware of the effects of shipping on the environment, they will know the basic available regulatory tools to manage these effects and they will be able to identify and use reliable sources of information on the subject. The ultimate challenge of the course is the student to be able to recall and apply the principles and provisions of the environmental management in maritime matters either in his/her academic activity or in his/her professional career.

Mode of delivery and teaching methods / Είδος μαθήματος και διδακτική μέθοδος

As a part of the study, the students are expected to actively participate in the course through discussions and contact with the instructor to resolve questions arising. Furthermore, each student will prepare an assignment in order to deepen its knowledge on a specific subject and also to be trained in searching valid scientific information to prove an hypothesis or document an issue. Specific guidelines for writing the assignment will be given, focusing on the structure, the content and the presentation. Special emphasis will be given on the documentation of the material with appropriate references to scientific sources. The sources for the assignment will be discussed with the instructor. It is stressed that the sources used should be scientifically valid and should be used critically. Direct copying from sources (plagiarism) will not be tolerated. The course material (notes, presentations, assignment topics and bibliography) will be posted on the e-learning platform e-class.

Compulsory & recommended reading / Υποχρεωτική & Συνιστώμενη βιβλιογραφία

A) Principal Reference:

- Kotrikla AM, 2013. Maritime Environmental Management, Lecture Notes, University of the Aegean, Chios, 99 pp.

B) Additional References:

- Clark R. B., 1997. “Marine Pollution” Clarendon Press, Oxford.
- HELMEPA, 1991. MARPOL and seafarers, Oil Pollution, HELMEPA, Athens (in Greek).
- ICS –OCIMF, 1994. Clean Sea Guides for Oil Tankers, International Chamber of Shipping, London and The Oil Companies International Marine Forum, Bermuda.
- IMO, 1993. MARPOL 73/78, Consolidated Edition, Naval and Technical Books, Editor G. Doumanis, Piraeus (in Greek).
- IMO, 1998. Guidelines for the Control and Management of Ship’s Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens, International Maritime Organization, London.
- IMO, 2005a. Antifouling Systems. International Convention on the Control of Harmful Anti-fouling Systems on Ships, International Maritime Organization, London.
- IMO, 2005b. Ballast Water Convention, International Maritime Organization, London.
- Kotrikla A., 2009. Environmental Management Aspects for TBT Antifouling Wastes from The Shipyards, Journal of Environmental Management 90 (Supplement 1): S77-S85.
- Pardali – Lainou A., 1996. Environmental Pollution by port services and the cost of the response, Proceedings of the two day conference Greek Coasts and Seas in 2000" 28-29 February 1996, University of Piraeus, pp. 241-254 (in Greek).

- Sakellariadou F. 1996. Port Reception Facilities, Proceedings of the two day conference Greek Coasts and Seas in 2000" 28-29 February 1996, University of Piraeus, pp. 225-239 (in Greek).
- Tan A. K.-J, 2006. Vessel Source Marine Pollution. The Law and Politics of International Regulation, Cambridge University Press, Cambridge.
- Triantafyllou G., Vergetis M. 2004. Oil Spills, Department of Naval Engineering, National Technical University of Athens (in Greek).
- Tselentis V., 2008. Management of marine environment and shipping, Stamoulis Editions, Athens (in Greek).
- IMO, 2009. Second IMO GHG Study 2009, International Maritime Organization (IMO), London, UK.

Assessment methods & criteria / Μέθοδος & κριτήρια αξιολόγησης

At the end of the course, students will have a written examination.
The rating will be formed:

- From the a final written examination and the presence of the student in lectures (70%)
- From the assessment of the assignment (30%)
