

Module Handbook: Aquaculture Environmental Management

A Module Handbook or collection of module descriptions that are also available for students to consult should contain the following information about the individual modules:

Module designation	Aquaculture Environmental Management is an elective course for students of the Aquaculture Study Program. This course studies understanding and scope, the relationship between aquaculture and the environment, regional and land-use master plan, minapolitan, environmental carrying capacity (physical, production, ecological and socio-economic), aquaculture layout and design, accessibility, cultivation facilities and infrastructure, the effects of climate change, and handling and management of aquaculture waste.
Module level, if applicable	Undergraduate
Code, if applicable	PIA 20193262
Subtitle, if applicable	Manajemen Tata Lingkungan Akuakultur
Courses, if applicable	-
Semester(s) in which the module is taught	6 th
Person responsible for the module	Dr. Ir. Bambang Triyatmo, MP.
Lecturer	Prof. Dr. Ir. Rustadi, M.Sc. Dr. Ir. Bambang Triyatmo, MP.
Language	Indonesian
Relation to curriculum	Study Program, Elective

Type of teaching, contact hours	Activities: 1. Lecture offline and online (lecture, discussion, assignment; 50 min/meeting) 2. Examinations (mid-term and final exam) 3. Independent studies online platform (eLOK, eLISA) (quiz, examination, discussion, and private study) This course uses blended learning and SCL (small group discussion, case-based learning) method.
Workload	1. Lecture $2 \text{ SKS} \times 50 \text{ minutes} \times 16 \text{ meetings} = 1,600 \text{ minutes}$ $= 26.67 \text{ hours}$ $= 26.67 \text{ hours} / 30 \text{ hours}$ $= 0.89 \text{ ECTS}$ 2. Structural Assignment $2 \text{ SKS} \times 60 \text{ minutes} \times 16 \text{ meetings} = 1,920 \text{ minutes}$ $= 32.00 \text{ hours}$ $= 32.00 \text{ hours} / 30 \text{ hours}$ $= 1.07 \text{ ECTS}$ 3. Self Study $2 \text{ SKS} \times 60 \text{ minutes} \times 16 \text{ meetings} = 1,920 \text{ minutes}$ $= 32.00 \text{ hours}$ $= 32.00 \text{ hours} / 30 \text{ hours}$ $= 1.07 \text{ ECTS}$ Total $= 3.03 \text{ ECTS}$
Credit points	2 credit points
Requirements according to the examination regulations	Students must attend at least 70% of the total 14 class meetings to be eligible to take the final exams.
Recommended prerequisites	Fundamentals of Aquaculture

Module objectives/intended learning outcomes	Course Learning Outcomes: CO-1: Explain the meaning of aquaculture environmental management; the relationship between aquaculture and the environment; regional and land-use master plan, minapolitan; environmental carrying capacity (physical, production, ecological and socio-economic) (PLO5-P3). CO-2: Explain the aquaculture layout and design; accessibility, cultivation facilities, and infrastructure; the effects of climate change; handling and management of aquaculture waste (PLO5-P3). Program Learning Outcome: PLO5-P5: To be able to provide an in-depth explanation of the theoretical concepts of techniques and management of aquatic organisms cultivation in fresh, brackish, and/or marine water that are productive, high quality, and sustainable using the latest technology, which includes preparation of infrastructure, management of water, fish-seeds, feed, health, and harvest.
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Content	Course Learning Outcomes CLO1 1. Introduction 2. Aquaculture and the Environment 3. Site Selection 4. Carrying Capacity (physical) 5. Carrying Capacity (production) 6. Carrying Capacity (ecological) 7. Carrying Capacity (socio-economic) CLO2 8. Impact of Climate Change on Aquaculture 9. Aquaculture and Zone Management 10. Ecosystem Approach (EA) in Aquaculture 11. Environmental Best / Better Management Practices (BMP) in Aquaculture 12. Review and presentation – 1 13. Review and presentation – 2 14. Review and presentation – 3
Study and examination requirements and forms of examination	Lectures Quizzes, paper, presentation Midterm examination Final examination
Media employed	LCD Zoom Video Textbook

Reading list	Bardach, J.E. (Ed.), 1997. Sustainable Aquaculture. John Wiley & Sons. 251 p. Costa-Pierce, B.A. (Ed.), 2005. Ecological Aquaculture: The Evolution of the Blue Revolution. Blackwell Science. 382 p. FAO, NACA, UNEP, WB, WWF, 2006. International Principles for Responsible Shrimp Farming. 20 p. v GESAMP, 1991. Reducing Environmental Impacts of Coastal Aquaculture. Rep. Stud. GESAMP No. 47. 35 p. GESAMP, 2001. Planning and Management for Sustainable Coastal Aquaculture Development. Rep. Stud. GESAMP No. 68. 90 p. GESAMP, 2008. Assessment and Communication of Environmental Risks in Coastal Aquaculture. Rep. Stud. GESAMP No. 76. 198 p. Hoanh, C.T., T.P. Tuong, J.W. Gowing and B. Hardy, 2006. Environment and Livelihoods in Tropical Coastal Zones: Managing Agriculture-Fishery-Aquaculture Conflicts. CABI Publishing. 309 p. Holmer, M., K. Black, C.M. Duarte, N. Marbà and I. Karakassis (Eds.), 2008. Aquaculture in the Ecosystem. Springer. 326 p. Pillay, T.V.R., 2002. Aquaculture and the Environment (2nd Ed.). Blackwell Publ. 196 p. Pillay, T.V.R. and M.N. Kutty, 2005. Aquaculture: Principles and Practices (2nd Ed.). Blackwell Publishing. 624 p.
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	Soto, D., J. Aguilar-Manjarrez, and N. Hishamunda (Eds), 2008. Building an Ecosystem Approach to Aquaculture. FAO Fisheries and Aquaculture Proceedings No. 14. FAO. 221 p. Staples, D. and S. Funge-Smith, 2009. Ecosystem Approach to Fisheries and Aquaculture: Implementing the FAO Code of Conduct for Responsible Fisheries. RAP Publication 11, FAO. 48 p. Stickney, R.R. and J.P. McVey (Eds.), 2002. Responsible Marine Aquaculture. CABI Publishing. 391 p. Tucker, C.S. and J.A. Hargreaves (Eds.), 2008. Environmental Best Management Practices for Aquaculture. John Wiley & Sons. 592 p.
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