



THE MODULE HANDBOOK

FACULTY OF BIOLOGY

Environmental Pollution and Toxicology

Module code	BIO 40305
Module level	Undergraduate
Abbreviation, if applicable	-
Sub-heading, if applicable	-
Courses included in the module, if applicable	-
Semester/term	Even
Module coordinator(s)	Dr.rer.nat. Andhika Puspito Nugroho, M.Si.
Lecture(s)	1. Dr.rer.nat. Andhika Puspito Nugroho, M.Si. 2. Siti Nurleily Marlina, S.Si., M.Sc., Ph.D.
Language	Indonesia
Classification within the Curriculum	Elective course
Teaching format/ class hours per week during the semester	This course is organised into one class and planned to have 14 learning weeks excluded midterm and final examination.
Workload	Estimated working hour: 2 credits of theory and 1 credit of laboratory work.
Credit points	2-1 credits
Requirements	Ecology (BIO 30302)
Learning goals/ competencies	<ol style="list-style-type: none">1. Workability<ol style="list-style-type: none">a. Planing, implementing, analyzing, and reporting a research in Environmental Pollution and Toxicology.b. Working in group.c. Learning independently both in the new environment and that has been known previously, with an open and critical spirit.2. Mastery of knowledge<ol style="list-style-type: none">a. Fact, basic concepts, principles and theories in the field of Environmental Pollution and Toxicology.b. Basic theory and instrumentation to carry out research in the field of Environmental Pollution and Toxicology.c. Mastering and applying scientific methods in the field of Environmental Pollution and Toxicology.



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	<p>d. Conducting a holistic approach to solve problems and creating a design; applying professional judgment of the costs, benefits, risks, security, trust, aesthetics, and environmental impact.</p> <p>3. Authority and responsibility</p> <p>a. Perform based communications technology effectively, whether written, oral, and with pictures.</p> <p>b. Set the time and resources effectively and efficiently.</p> <p>c. Being able to anticipate problems and find a way of solving problems related to Environmental Pollution and Toxicology.</p> <p>d. Appreciate the originality of ideas, concepts, and other inventions.</p> <p>e. Expanding the scope of professional development in career.</p> <p>f. The responsibility of professional and scientific ethics as an expertize in the Environmental Pollution and Toxicology to the community and the world.</p>
Content	<p>This course is designed to give a picture of pollution in environment and toxicology of pollutants. This course aims to provide insight to students about complex interactions between humans and nature, the negative impact of environmental pollution on humans, wildlife, and other bioreceptors in both terrestrial and aquatic ecosystems. In this lecture will be studied the types of pollutants and their effects; source, transport and transformation in the nature, disposition within the organisms, and mechanisms of toxicity; toxicity assessment of pollutants in biological systems and the environment; the effects of environmental pollution on the physical, chemical, and biological properties of water and soil; as well as methods of prevention, reduction, and remediation of environmental pollution.</p>
Study/exam achievements	<ol style="list-style-type: none">1. Midterm: 25%2. Final examination: 50%3. Assignment: 25%4. Quiz: 10 %
Forms of media	White board, LCD
Literature	<ol style="list-style-type: none">1. Berg, M.V.D., D.V.D. Meent, W.J.G.M. Peijnenburg, D.T.H.M. Sijm, J. Struijs, and J.W. Tas. 1995. Transport, accumulation, and transformation processes. p. 52 – 59. In C.J. van Leuween and J.L.M. Hermens [eds.]. Risk assessment of chemical : an introduction. Kluwer Academic Publisher. Netherlands.



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2. Hattum, B.V. 1995. Toxicokinetic and bioconcentration of polycyclic aromatic hydrocarbons in freshwater isopods. p. 75 – 99. In B.V. Hattum [ed.]. Bioaccumulation of sediment – bond contaminant by freshwater isopod *Asellus aquaticus* (L.). The Institute for Environmental Studies of Vrije Universiteit.
3. Jeffree, R.A., S.J. Markich, and P.L. Brown. 1995. Australian freshwater bivalves : their applications in metal pollution studies. *Australasian Journal of Ecotoxicology*. Vol. 1, pp. 33 – 41.
4. Karr, J.R., and E.W. Chu. 1999. Restoring life in running waters : better biological monitoring. Island Press. Washington.
5. Leeuwen, C.J.V. and J.L.M. Hermens (eds). 1995. Risk assessment of chemicals : an introduction. Kluwer Academic Publishers. Netherlands.
6. Manahan, S.E. 1994. Environmental Chemistry. Sixth edition. CRC Press, Inc. USA.
7. Stine, K.E., and T.M. Brown. 1996. Principles of Toxicology. CRC Press, Inc. USA.
8. Walker, C.H., S.P. Hopkin, R.M. Sibly, and D.B. Peakall. 2001. Principles of ecotoxicology. 2nd edition. Taylor & Francis, Inc. New York.
9. Widianarko, B. and N.V. Straalen. 1996. Toxicokinetic – based survival analysis in bioassay using nonpersistent chemical. *Environ. Toxicol. Chem.* 15 : 402 – 406.