

## Module Handbook

Module designation	Geographic Information System for Biology (course code MPB 2185)
Semester(s) in which the module is taught	5
Person responsible for the module	<i>Irwan Lovadi, PhD</i>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<b><i>Elective</i></b>
Teaching methods	<i>lecture and lab work</i>
Workload (incl. contact hours, self-study hours)	<p><i>(Estimated) Total workload: 170 minutes x 3-unit x 16 = 8,160 minutes (136 hours)</i></p> <p><i>Contact hours (please specify whether lecture, exercise, laboratory session, etc.):</i></p> <p><i>lecture: every Friday, 09:30 - 11:10</i></p> <p><i>laboratory session: Tuesdays, 09:30 - 12:00</i></p> <p><i>Self-directed study including examination preparation, specified in hours<sup>1</sup>: 180 minutes x 16 session = 2,880 minutes (48 hours)</i></p>
Credit points	<i>3 unit</i>
Required and recommended prerequisites for joining the module	<i>Plant Ecology (course code MPB 3122) and Animal Ecology (course code MPB 3123)</i>

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<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<p>Module objectives/intended learning outcomes</p>	<p><b>General skills:</b> <i>Mastering and being able to apply biological science and other scientific fields that support the development of biological sciences</i></p> <p><b>First specific skill:</b></p> <ol style="list-style-type: none"> <li>1) <i>Able to plan, solve problems and provide recommendations for sustainable management of tropical wetland resources</i></li> <li>2) <i>Able to work in teams and communicate actively orally and in writing in the field of biological sciences</i></li> </ol> <p><b>Second specific skills:</b> <i>Mastering biological instruments and methodologies and being able to apply them in the management of tropical wetland resources</i></p>
<p>Content</p>	<p><i>The subject exposes students to the basic knowledge required to principles of geographic information system. Students will be acquainted with the concepts and definitions of Geographic Information Systems (GIS), applications of GIS in biology and introduction to R and RStudio, map projections and datums, data and GIS data formats, GIS data quality, GPS, vector analysis, raster analysis, remote sensing in biology, and species distribution modelling</i></p>
<p>Examination forms</p>	<p><i>Quizzes, lab report, and project report</i></p>
<p>Study and examination requirements</p>	<p><i>Re-registration and 75% attendance.</i></p>

Reading list	<ol style="list-style-type: none"><li>1) <i>Prahasta, E. 2009. Sistem Informasi Geografis: Konsep-konsep Dasar Perspektif Geodesi dan Geomatika. Bandung: Departemen Komunikasi dan Informatika.</i></li><li>2) <i>MacLeod, C.D. 2015. GIS For Biologists: A Practical Introduction for Undergraduates. Glasgow: Pictish Beast Publications.</i></li><li>3) <i>Guisan, A., Thuiller, W., and Zimmermann, N.E. 2017. Habitat Suitability and Distribution Models with Applications in R. Cambridge: Cambridge University Press.</i></li><li>4) <i>Zurell, D, et al., 2020. A standard protocol for reporting species distribution models. Ecography. doi:10.1111/ecog.04960.</i></li><li>5) <i>Hijmans, RJ, et al. 2020. Package 'dismo'.</i></li><li>6) <i>Phillips, SJ, Dudík, M &amp; Schapire, RE 2017. Maxent software for modelling species niches and distribution. 3.4.1 ed.</i></li></ol>
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