

GENETIC ENGINEERING

Module designation	<i>Genetic Engineering</i>
Semester(s) in which the module is taught	2
Person responsible for the module	1. Prof. Dr. Bambang Prajogo E.W., MS., Apt. (Course Coordinator) 2. Prof. Dr. Ni Nyoman Tri Puspaningsih, M.Si. 3. Prof. Dr. Afaf Baktir, MS., Apt.
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory</i> / <i>elective</i> / <i>specialisation</i>
Teaching methods	<i>lecture, discussion, assignment</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: Contact hours (structured activities.): 90,67 hours Private study including independent learning activities: 90,67 hours</i>
Credit points	<i>2 SCU / 6 ECTS</i>
Required and recommended prerequisites for joining the module	NA

<p>Module objectives/intended learning outcomes</p>	<p>Students are:</p> <p>LO1: Able to realize excellence based on religious morals (excellence with morality), able to work together, and show a responsible attitude to work in their field of expertise independently</p> <p>LO2: Able to internalize the spirit of independence, struggle, and entrepreneurship</p> <p>LO4: Able to develop a pharmaceutical professional performance with analytical acumen in solving pharmaceutical problems and managing research in the pharmaceutical field related to national and global systems and policies, both inter and inter-disciplinary approaches.</p> <p>LO5: Able to access and review information through an Information and Communication Technology (ICT) system, decide on a specific subject of study, maintain the feasibility of implementing research designs, conduct research, analyze data, conclude research results comprehensively, and create strategic issues based on the study that reflect the latest updates in the field of pharmaceutical sciences, and communicate them in the media and scientific forums at the national and international level through an interdisciplinary or multidisciplinary approach in the form of a thesis or other equivalent forms.</p> <p>LO6: Able to make decisions in the context of solving problems related to science and technology development based on analytical or experimental studies through collaboration with colleagues, colleagues in institutions and research communities at both national and international levels and utilizing research results for the benefit of the user and other communities.</p> <p>LO7: Able to analyze natural materials to obtain active ingredients and/or pharmaceutical excipients with due observance of nature conservation.</p> <p>LO8: Able to carry out drug designs through the synthesis of bioactive compounds based on the structure-activity relationship.</p> <p>LO9: Able to carry out molecular manipulation of substances and develop formulations and manufacturing of pharmaceutical preparations with active pharmaceutical ingredients derived from natural products and synthetic compounds through the manufacture of polymorphs, nanoparticles, solid dispersions</p> <p>LO13: Able to design drug development both from natural products and/or synthetic compounds by considering the biological mimicry system.</p> <p>LO15: Able to plan and organize concepts and procedures for quality assurance and recommendations on pharmaceutical products, which include drugs, cosmetics, foods, and beverages as products and therapeutic goods.</p>
<p>Content</p>	<p>This lecture will cover topics including: Application of enzymes, isolation and characterization of enzymes, genetic engineering of enzymes, techniques of recombinant DNA, mutagenesis, isolation of plasmid DNA and chromosomal DNA, enzymes involved in gene cloning, types of vectors and viruses.</p>

Exams and assessment formats	<i>Final exam (100 minutes), presentation (100 minutes), take-home written assignments</i>
Study and examination requirements	<i>the final grade in the module is composed of 40% performance on final exams, 25% presentation, 25% take-home assignments, 10% in-class participation and soft-skills assessment. Students must have a final grade of 70% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> 1. <i>Enzymes: Review of Physiological Chemistry, 1975, Harper, H.A and Rodwel, 15th Edition. Los Altos Ca, Lange Medical Publications.</i> 2. <i>Principles of Biochemistry, 1993, Lehninger, A.L., Nelson, D.L. and Cox, M.M, 2 nd Edition New York: Wort Publisher</i> 3. <i>The Enzymes Chemistry and Mechanism of Action, 1951, Summer, JB and Myrback, K, NY: Acad Press.</i>