

## TRANSDERMAL DELIVERY SYSTEM

Module designation	<i>Transdermal Delivery System</i>
Semester(s) in which the module is taught	2
Person responsible for the module	<ol style="list-style-type: none"> <li>1. Prof. Dra. apt. Esti Hendradi, M.Si., Ph.D (<b>Course Coordinator</b>)</li> <li>2. Dr. apt. Tutiek Purwanti, M.Si.</li> <li>3. Prof. apt. Akhmad Kharis N, S.Si., M.Si., Ph.D.</li> <li>4. Prof. Dr. apt. Tristiana Erawati M., M.Si.</li> </ol>
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory / elective / 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>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>LO10: Able to develop pharmaceutical management systems and policies related to the referral health care system and the role and function of pharmacists as an integral part of the health care team in order to improve community welfare</p> <p>LO13: Able to design drug development both from natural products and/or synthetic compounds by considering the biological mimicry system.</p> <p>LO14: Able to build drug management systems from active pharmaceutical ingredients to finished products that are ready for therapeutic uses.</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>
-----------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Content	This course discusses the concepts of transdermal drug delivery, patch preparations, vesicle systems, microspheres systems, spanplastic systems, nanoemulsion systems, iontophoretic systems, sonophoretic systems, electrophoretic systems and microneedles in transdermal delivery
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% presentations, 50% 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"> <li>1. Guy,R.H., Hadgraft, J., 2003. Transdermal Drug Delivery. Drugs and the Pharmaceutical Sciences. Vol 123. . Marcel Dekker Inc. New York.</li> <li>2. Walters, K.A., 2002. Dermatological and Transdermal Formulations. Drugs and the Pharmaceutical Sciences. Vol 119. . Marcel Dekker Inc. New York.</li> <li>3. Larrañeta, E, Lutton, REM, Woolfson, AD, &amp; Donnelly, RF 2016, 'Microneedle arrays as transdermal and intradermal drug delivery systems: Materials science, manufacture and commercial development', <i>Materials Science and Engineering Reports</i>,vol. 104, hal. 1–32.</li> <li>4. Kevin Ita, 2020. Transdermal Drug Delivery. Concepts and Application. Academic Press is an imprint of Elsevier, London</li> </ol>