ADVANCED PHYSICAL PHARMACY

Module designation	*Advanced Physical Pharmacy*
Semester(s) in which the module is taught	*1*
Person responsible for the module	1. Dr. Dewi Isadiartuti, M.Si., Apt **(Course Coordinator)** 2. Prof. Dr. Dwi setyawan, m.Si., Apt. 3. Prof. Dra. Esti Hendradi, MSi, PhD.,Apt 4. Prof. Dr. Noorma Rosita, M.Si., Apt. 5. Dr.rer.nat. Maria Lucia Ardhani D.L., M.Pharm.Sci., Apt
Language	*Bahasa Indonesia*
Relation to curriculum	~~*Compulsory / elective*~~ */ specialisation*
Teaching methods	*lecture, discussion, assignment*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* *Contact hours (structured activities.): 90,67 hours* *Private study including independent learning activites*: *90,67 hours*
Credit points	*2 SCU / 6 ECTS*
Required and recommended prerequisites for joining the module	*NA*

Module objectives/intended learning outcomes	Students are: 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 LO2: Able to internalize the spirit of independence, struggle, and entrepreneurship 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 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. LO7: Able to analyze natural materials to obtain active ingredients and/or pharmaceutical excipients with due observance of nature conservation. LO8: Able to carry out drug designs through the synthesis of bioactive compounds based on the structure-activity relationship. 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. LO11: Able to develop systems for evaluating the bioavailability of drugs in the body, pharmaceutical products circulation permits, and their in-vitro and in-vivo evaluations with specific delivery systems with appropriate analytical methods. LO13: Able to design drug development both from natural products and/or synthetic compounds by considering the biological mimicry system. LO14: Able to build drug management systems from active pharmaceutical ingredients to finished products that are ready for therapeutic uses 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

Content	This course discusses the concept of characterization of solids, strategies to increase solubility, particle size analysis, diffusion and dissolution systems, stability and kinetics of pharmaceutical materials, interfacial phenomena, flow systems and rheological properties as well as the concept of dispersion systems underlying the formulation of pharmaceutical preparations and their evaluation and delivery systems.
Exams and assessment formats	*Final exam (100 minutes), Presentation (100 minutes), take-home written assignments*
Study and examination requirements	*the final grade in the module is composed of 40% performance on final exams, 50% take-home assignments, 10% in-class participation and soft-skills assessment. Students must have a final grade of 70% or higher to pass*
Reading list	1. Sinko PJ (2017). *Martin's physical pharmacy and pharmaceutical sciences*. 2. Rosen MJ, Kuniappu JT (2012). *Surfactants and interfacial phenomena*. 3. Carstensen JT (1977). *Pharmaceutics of solids and solid dosage forms*. 4. Allen T (2013). *Particle size measurement*. 5. Connors KA, Amidon GL, Stella VJ (1986). *Chemical stability of pharmaceuticals: a handbook for pharmacists*. 6. .Byrn, S. R., Zografi, G., & Chen, X. S (2017). Solid-state properties of pharmaceutical materials. John Wiley & Sons. 7. Newman, A., & Wenslow, R. (2018). Solid-state Characterization Techniques. Pharmaceutical Crystals: Science and Engineering, 89-121. 8.U.S. Department of Health and Human Services Food and Drug Administration (1997) *Guidance for Industry Dissolution Testing of Immediate Release Solid Oral Dosage Forms* *9.* U.S. Department of Health and Human Services Food and Drug Administration (2018). *Dissolution Testing and Acceptance Criteria for Immeadiate-Release Solid Oral Dosage form Drug Products Containing High Solubility Drug Substances - Guidance for Industry.* 10.Blaine T Smith (2016). *Physical Pharmacy – Remington Education*