DRUG DELIVERY AND TARGETING

Module designation	Drug Delivery and Targeting
Semester(s) in which the module is taught	2
Person responsible for the module	1. Andang Miatmoko, Ph.D., Apt.**(Course Coordinator)** 2. Prof. Esti Hendradi, M.Si., Ph.D., Apt. 3. Prof. Dr. Retno Sari, M.Sc., Apt. 4. Prof. Dewi Melani H., M.Phil., Ph.D., Apt. 5. Dr. M. Agus Syamsur Rijal, M.Si., Apt. 6. Helmy Yusuf, M.Sc., Ph.D., Apt. 7. Mahardian Rahmadi, M.Sc., Ph.D., 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. 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. 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. 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	The Drug Delivery and Targeting discusses concepts and developments, approach methods in drug product formulation, bioavailability, pharmacodynamics with the effectiveness and efficacy of drug use and the application of drug delivery and targeting in treatment.
Exams and assessment formats	50% take-home assignment, *20% Mid term exam, 20% final exam*

Study and examination requirements	*the final grade in the module is composed of 50% take-home assignment, 20% mid term exam, 20% final exam , 10% in-class participation and soft-skills assessment. Students must have a final grade of 70% or higher to pass*
Reading list	1. *Gabizon AA, Patil Y, La-Beck NM. New insights and evolving role of pegylated liposomal doxorubicin in cancer therapy. Drug Resist Updat. 2016 Nov;29:90-106. doi: 10.1016/j.drup.2016.10.003. Epub 2016 Oct 29. PMID: 27912846.* 2. *Torchilin, V.P. (2010). Passive and Active Drug Targeting: Drug Delivery to Tumors as an Example. In: Schäfer-Korting, M. (eds) Drug Delivery. Handbook of Experimental Pharmacology, vol 197. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-00477-3_1* 3. *Donnelly RF. Vaccine delivery systems. Hum Vaccin Immunother. 2017 Jan 2;13(1):17-18. doi: 10.1080/21645515.2016.1259043. PMID: 28125375; PMCID: PMC5287301.* 4. *Nobuhiro Nishiyama,Yasuhiro Matsumura,Kazunori Kataoka. Development of polymeric micelles for targeting intractable cancers. Cancer Sci 107 (2016) 867– 874* 5. *Ajay Kumar Thakur, Dinesh Kumar Chellappan, Kamal Dua, Meenu Mehta, Saurabh Satija & Inderbir Singh (2020) Patented therapeutic drug delivery strategies for targeting pulmonary diseases, Expert Opinion on Therapeutic Patents, 30:5, 375-387, DOI: 10.1080/13543776.2020.1741547*