INHALATION DELIVERY SYSTEM

Module designation	*Inhalation Delivery System*
Semester(s) in which the module is taught	*2*
Person responsible for the module	1. Prof. Dewi Melani Hariyadi, M.Phil., Ph.D., Apt. **(Course Coordinator)** 2. Prof. Dra. Esti Hendradi, MSi, PhD.,Apt 3. Prof. Dr. Retno Sari, MSc., 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	This course discusses the concept of SPO inhalation, working mechanisms and factors that influence deposition, product formulation, quality and determination of the quality of inhalation products and the design and development of Inhalation 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 and presentations, 10% in-class participation and soft-skills assessment. Students must have a final grade of 70% or higher to pass*
Reading list	1. Bisgaard,H., O'Callaghan C., Smaldone G.C., 2019. Drug Delivery to The Lung. CRC Press. 2. Hickey, A.J.,Rocha d., 2021. Pharmaceutical Inhalation Aerosol Technology, Third Edition (Drugs and the Pharmaceutical Sciences) 3rd Edition, CRC Press. 3. Hickey, A.J , Mansour HM., 2009, Book Volume 2, Book Chapter 5: Delivery of Drugs by the Pulmonary Route. In A. T. Florence, & J. Siepmann (Eds.), Modern Pharmaceutics: Applications and Advances (5th ed., Vol. 2, pp. 191-219). (Drugs and the Pharmaceutical Sciences Series), (Drugs and the Pharmaceutical Sciences Series; No. 5). Informa Healthcare. http://informahealthcare.com/doi/abs/10.3109/9781420065688.005?prevSearch=authorsfield%253A%2528Mansour%252C%2BHeidi%2BM.%2529&searchHistoryKey= 4. Rathbone, M.J, Hadgraft, J., Robert, M.S., 2008. Modified Release Drug Delivery Technology, CRC Press.