

Module Handbook

Module Name:	Biophysics
Module Level:	Undergraduate
Abbreviation, if applicable:	FIB 205
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/term:	3 rd / second Year
Module coordinator(s):	Prof. Dr. Ir. Suhariningsih
Lecturer(s):	Prof. Dr. Ir. Suhariningsih, Prof. Dr. Retna Apsari, M.Si Dr. Suryani Dyah Astuti, M.Si, Nurul Fitriyah, S.Si., M.Sc
Language:	Bahasa Indonesia
Classification within the curriculum	Compulsory Course / Elective Studies
Teaching format / class hours per week during semester:	2 hours lectures (50 min / hour)
Workload:	2 hours lectures, 2 hour structural activities, 2 hours individual study, 14 week per semester, and total 78 hours per semester ~2.6 ECTS
Credit Points:	2
Requirements:	Physics I , Basic Biology
Learning goals/competencies:	<p>General Competence (Knowledge): After following this course, the students will be able to understand the whole physical aspect phenomenon in the human body system (bio-mechanic, bio-fluid, bio-magnetism, bio-acoustic, bio-optic, bio-radiation)</p> <p>Specific Competence: After following this course, the students will be able to:</p> <ol style="list-style-type: none"> 1. Explain physical phenomenon on bio-organ interaction including muscle workload (biomechanics) 2. Explain fluid mechanic system in human body (bio-fluid) 3. Explain nerve system and electrical transport mechanism (bio-electric) 4. Explain magnetism phenomena in the human body system (bio-magnetism) 5. Explain the physical aspects of the ear and hearing. ultrasonic radiation (bioacoustics) 6. Explain the optical aspect of an eye and seeing mechanism (bio-optic) 7. Explain the physical phenomenon of electromagnetic wave, radioactivity and radiation
Content:	<p>Muscle: introduction of muscle structure, physical phenomenon on muscle contraction, chemical phenomenon of muscle. Fluid Mechanics: lung and respiratory system, blood pressure and flow rate. Electromagnetism Biology Aspect: electrical impedance, biological impedance measurement, electromagnetic radiation, laser radiation, microwave radiation. Hearing Nerve System: spatial theory, temporal theory, hearing mechanism. Optical Nerve System: color differentiation, separate nerve responses, coordinated nerve responses, cortical imaging.</p>

Attribut soft skill	Active and good communication
Study/exam achievements:	<p>Students are considered to be competent and pass if at least get 40 of maximum mark of the exams (UTS dan UAS), structured activity (group discussion).</p> <p>Final score (NA) is calculated as follow: 15% assignment 1 + 15% assignment 2 + 35% UTS + 35% UAS</p> <p>Final index is defined as follow:</p> <p>A : 75 – 100</p> <p>AB : 70 - 74.99</p> <p>B : 65 - 69.99</p> <p>BC : 60 - 64.99</p> <p>C : 55 - 59.99</p> <p>D : 40 - 54.99</p> <p>E : 0 - 39.99</p>
Forms of Media:	Slides and LCD projectors, whiteboards
Learning Methods	Lecture, assessments and group discussion
Literature:	<ol style="list-style-type: none"> 1. Herman Cember and Thomas E. Jhonson, <i>Introduction to Health Physics</i>. 4th ed., (McGraw Hill. New York, NY. 2009). 2. B H Brown, R H Smallwood, D C Barber, P V Lawford and D R Hose, 1999, <i>Medical Physics and Biomedical Engineering</i>, IOP Publishing Ltd. 3. Davidovits, P. 2001. <i>Physics in Biology and Medicine</i>. A Harcourt and Technology Company, USA
Notes:	*Total ECTS = {(total hours workload × 50 min) / 25 hours Each ECTS is equals with 25 hours.