MODULE HANDBOOK

Course:	**Modeling Physics**
Module Level:	Undergraduate
Code:	FIK309
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term:	6th / Third year
Module Coordinator:	Drs. R. Arif Wibowo, M.Si
Lecturer(s):	Drs. R. Arif Wibowo, M.Si and Dr. Ir. Soegianto Soelistiono, M.Si
Language:	Bahasa Indonesia
Classification within the Curriculum:	~~Compulsory Course~~ / Elective Course
Teaching format / class hours per week during semester:	2 hours lectures (50 min / hour)
Workload:	2 hours of lectures, 2 hours of structural activities, 2 hours of individual study, 13 weeks per semester, and total of 78 hours per semester ~ 2.6 ECTS*
Credit Points:	2
Requirement(s):	FIT 201 Mathematical Physics I, FIT 202 Mathematical Physics II, FIK306 Computational Physics (Practical)
Learning Goals/Competencies:	**General Competence (Knowledge) :** Students are able to : 1. Analyzing the system with mechanical models or electricity model through mathematical formulas 2. Build a physics modeling system with computation or computing simulation **Specific Competence:** 1. Students are able to explain the differences between the models, reality, theories, and laws of physics 2. provide examples of closed solutions and numerical solutions / simulation 3. Provide an overview of 2D and 3D space simulation 4. Provide an overview of the model based on the data obtained by either interpolation or extrapolation
Contents:	Introduction models, reality, theories, and laws of physics. Modeling types: quantitative and qualitative models, deterministic and stochastic models, types of solutions: closed solutions and numerical solutions / simulation, Components and Procedure Modeling: Object, interaction, system objects, and process. Equation interpolation and extrapolation of data models. Sensitive system modeling
Soft Skill Attribute:	Ethic and effort.

Study/Exam Achievements:	The score is determined by soft skill(15%), assement (15%), presentation(10%), midterm test (30%) and final exam(30%) Final grade is defined as follow: A : 75 – 100 AB : 70 - 74.99 B : 65 - 69.99 BC : 60 - 64.99 C : 55 - 59.99 D : 40 - 54.99 E : 0 - 39.99
Forms of Media:	Whiteboard, projector.
Learning Methods:	Lecturing, homework, tutorial
Literature(s):	1. Boundless. *Models, Theories, and Laws. Boundless Physics*. Boundless, 21 Jul. 2015. Retrieved 28 Dec. 2015 from https://www.boundless.com/physics/textbooks/boundless-physics-textbook/the-basics-of-physics-1/the-basics-of-physics-31/models-theories-and-laws-195-6078/ 2. Metaxas, D. N., 1992, *PHYSICS-BASED MODELING OF NONRIGID OBJECTS FOR VISION AND GRAPHICS*, A thesis submitted in conformity with the requirements for the Degree of Doctor of Philosophy, Graduate Department of Computer Science, University of Toronto, 3. Guo, J., 2004, *CARBON NANOTUBE ELECTRONICS: MODELING, PHYSICS, AND APPLICATIONS,* A Thesis Submitted to the Faculty of Purdue University, In Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy, 4. John G. Michopoulos, Charbel Farhat, Jacob Fish, 2005, *Survey on Modeling and Simulation of Multiphysics Systems*, Computational Multiphysics Systems Laboratory U.S. Naval Research Laboratory Washington DC, Institute for Computational and Mathematical Engineering stanford University, Rensseleaer Polytechnic Institute Troy, NY, 5. Hestenes, D., *Toward a modeling theory of physics instruction* , Published in: Am. J. Phys. 55 (5), May 1987, pp 440-454, 6. Marcus A. Brubaker, Leonid Sigal, David J. Fleet, 2009, *Physics-Based Human Motion Modeling for People*, A Short Tutorial, Department of Computer Science, University of Toronto, Disney Research, Pittsburgh, PA,
Notes:	*Total ECTS = {(total hours workload x 50 min) / 60 min } / 25 hours Each ECTS is equals with 25 hours