

MODULE HANDBOOK

Course	:	Smart Systems
Module Level	:	Undergraduate
Code	:	FIK310
Sub-heading, if applicable:	:	-
Courses included in the module, if applicable:	:	-
Semester/Term	:	5 th /Third Year
Module Coordinator(s):	:	Dr. Soegianto Soelistiono, M.Si
Lecturer(s):	:	Dr. Riries Rulaningtyas, M.T.
Classification within the curriculum	:	Compulsory Course / Elective Course
Teaching format / class hours per week during semester:	:	2 hours of lectures (50 min / hour)
Workload	:	2 hours of lectures, 2 hours of structural activities, 2 hours of individual study, 14 weeks per semester, and total of 84 hours per semester 2.8 ECTS*
Credit Points	:	2
Requirement(s)	:	Computational Physics I
Learning Outcome	:	<p>LO3: Solve problems by applying physical concepts and principles to theoretical analysis, modeling and simulation.</p> <p>LO4: Able to use scientific methods and apply them in physical problems and develop interdisciplinary problems</p> <p>LO6: Familiar with information technology and able to take advantage of physics related problems</p> <p>LO7: Able to apply physical knowledge and principles in the field of industry and medical and other interdisciplinary fields</p>
Learning Goals/Competences:	:	<p>General Competence (Skill): After attending a course, students can apply the concept of intelligent systems as decision makers in the medical and industrial fields</p> <p>Specific Competence: The students are able to:</p> <ol style="list-style-type: none"> 1. Students are able to implement fuzzy concepts in medical and industrial applications 2. Students are able to implement the concept of artificial intelligence in medical and industrial applications 3. Students are able to implement the concept of expert systems in medical and industrial applications
Contents	:	Fuzzy: Fuzzy set theory, membership function, fuzzy logic, fuzzy inference systems, artificial neural networks: backpropagation, fuzzy neural, Self Organizing Map; Genetic Algorithms; Clustering: k-means clustering, clustering hierarchy; Expert System: decision

	:	tree, forward chaining, backward chaining.
Soft Skill Attribute	:	Creativity, communication, discipline, cooperation
Study/Exam Achievements	:	<p>Students are considered competent and eligible to pass the course upon obtaining at least 40 of maximum score for the exams (midterm test and final exam), structured activity (group discussion).</p> <p>Final score is calculated as follow: 20% assignment 1 + 20%assignment 2 + 30% midterm + 30% final exam</p> <p>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</p>
Forms of Media	:	Powerpoint slides, LCD projectors and whiteboards
Learning Methods	:	Lecture, assessments and group discussion
Reference	:	<ol style="list-style-type: none"> 1. Fauset, L., 1994, Fundamental of Neural Network. Prentice Hall, Inc, United Stated. 2. Coley, D., 1999, An Introduction to Genetic Algorithms for Scientists and Engineers, World Scientific, USA. 3. Chen, G., Pham, T.T., 2001, Fuzzy Sets, Fuzzy Logic and Fuzzy Control Systems, CRC Press 4. Graupe, D., 2007, Principles of Artificial Neural Networks, second edition, World Scientific, USA.
Notes:		*Total ECTS= $\{(total\ hoursworkload \times 50min) / 60min\} / 25hours$ Each ECTS isequalswith25hours