UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 546194 Fax: +62 274 546194 Email: dep-ike.mipa@ugm.ac.id

Doctoral Programme of Computer Science

Telephone	: (0274)546194
Email	: s3ik.mipa@ugm.ac.id
Website	: http://dcse.fmipa.ugm.ac.id/site/id/s3-ilmu-komputer/

Module name	: **U**NCERTAINTY
Module level, if applicable	: **D**OCTORAL
Code, if applicable	: MII7435
Semester(s) in which the module is taught	: 1 (Odd)
Person responsible for the module	: Aina Musdholifah, S.Kom., M.Kom., Ph.D.
Lecturer(s)	: Aina Musdholifah, S.Kom., M.Kom., Ph.D., Drs. Retantyo Wardoyo, M.Sc., Ph.D.
Language	: Indonesia
Relation to curriculum	: Doctorate; elective; 1st or 3rd semester.
Credit points	: 3 credits
Type of teaching, contact hours	: Doctorate: lectures for < 5 students. Contact hours are lecture hours.
Workload	: (1) Lectures and discussion: 3 x 50 = 150 minutes (2.5 hours) per week. (2) Exercises and assignments: 3 x 60 = 180 minutes (3 hours) per week. (3) Independent study: 3 x 60 = 180 minutes (3 hours) per week.
Requirements according to the examination regulations	: -
Recommended prerequisite	: Artificial Intelligence
Module objectives/ intended learning outcomes	: This course is a postgraduate level course that contains advanced knowledge of one aspect of knowledge-based systems, namely the inference component, to deal with uncertainty in both the data and the knowledge base. This course discusses uncertainty models, fuzzy logic, the application of Bayes' theorem, and uncertain reasoning. After completing this course, students are expected to be able to:

	CO1: analyse the characteristics, causes, and forms of uncertainty in the inference process CO2: analyse the importance of handling uncertainty in both data and knowledge base in the inference process. CO3: evaluate the existing methods of handling uncertainty. CO4: implement methods of handling uncertainty to solve real problems. CO5: identify research opportunities regarding uncertainty and its handling.
Content	: Topics covered in this course include: what is knowledge and inference machine; certainty vs uncertainty data and inference; uncertainty models; uncertainty management; fuzzy logic for uncertainty data; uncertainty reasoning, bayes theorem for uncertainty management; research trend of uncertainty management.
Study and examination requirements and forms of examination	: Evaluation is done in 2 forms, namely: 1. Literature review of uncertainty. 2. A short review paper on state-of-the-art methods in formal methods. 3. A project assignment Assessment is done using benchmark assessment, with the aim of measuring the level of students' understanding related to the target.
Media employed	: Whiteboard, LCD, online meeting
Reading List	: 1. Wang, L., 1997, " A Course in Fuzzy System and Control", Prentice-Hall International Inc., New Jersey. 2. Zimmerman, H.J., 1991, "Fuzzy Set Theory and Application", Kluwer Publishing Co., Amsterdam. 3. Kaufmann, A., and M.M. Gupta, "Introduction to Fuzzy Arithmetic Theory and Application", Van Nostrand Reinhold, New York.

The Mapping of COs to PLOs

COs	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO1							■	
CO2							■	
CO3							■	
CO4		■				■		■
CO5		■		■				

The PLO of DP-CS

PLO	Knowledge Area	PLO Description
PLO1	[Values and principles]	A graduate should be devoted to God Almighty, uphold the humanity values, internalize academic values and ethics, and be responsible in working around expertise independently.
Managerial Capability		
PLO2	[Professional attitudes]	A graduate should have good interpersonal skills; able to work together within the organization, both as a leader and a member; able to be the initiator; able to manage and delegate tasks; and have a sense of responsibility for their own work as well as take responsibility for the achievement of the organization's work.
PLO3	[Communication skills]	A graduate should be able to communicate effectively and efficiently with stakeholders from various backgrounds; use English well; and be able to write and present scientific papers correctly and well.
PLO4	[Life-long learning]	A graduate should be up to date with the state-of-the-art especially in the computer science field, able to take part in the development of the computer science field that is engaged in and relate it to other fields throughout life.
Working Capability		
PLO5	[Problem-solving and Scientific skills]	A graduate should be able to analyse science and technology problems in the computer science field, develop alternative solutions through intra disciplinary, interdisciplinary, and trans disciplinary approaches to produce innovative, original, and tested works.
PLO6	[Ability to formulate and do research]	A graduate should be able to formulate research problems through critical, exploratory, and innovative studies both independently and in groups of computer science that are engaged in and present research results in a scientific paper at regional or international level.
Mastering Knowledge		
PLO7	[Fundamental knowledge]	A graduate should be able to develop knowledge in the field of computer science that is engaged, which includes abstraction, complexity, evolution and philosophy of changes or developments in the field of science.
PLO8	[Applied knowledge]	A graduate should be able to develop theoretical, philosophical, and applied concepts in the field of computer science that is engaged in, and to represent them in a structured and systematic manner.