Module Name	Watershed Management
Module level, if applicable	Advance
Code, if applicable	GEL 3210
Semester(s) in which the module	5^{th}
Person responsible for the module	Dr. Slamet Suprayogi, M.S.
Lecturer	1. Dr. Slamet Suprayogi, M.S. 2. Dr. Dyah Rahmawati Hizbaron, M.T., M.Sc
Language	Bahasa Indonesia
Relation to curriculum	Watershed Management is part of the science of hydrology that specifically learn about how to manage watersheds in an integrated and sustainable way. Watershed management lecture studies are emphasized on several learning points, including understanding and the nature of watersheds; watershed problems from water, land, population, institutional aspect and related agencies; methods for identification watershed problems; watershed zone zoning and determination critical level of the watershed; ways of watershed conservation and the preparation of integrated watershed management programs.
Type of teaching, contact hours	STAR *(Student Teacher Aesthetic Role-Sharing)* is an optimal combination between SCL *(Student Centered Learning)* and TCL *(Teacher Centered Learning)*.
Workload	Lecturer, including homework and discussion : 14 meetings x 100 minutes each Mid Semester Examination: 100 minutes Final Semester Examination: 100 minutes Total workload = 1600 minutes
Credit points	2 Credits
Requirements according to the examination regulations	Minimum attendance requirement 70% from total lecture
Recommended prerequisites	Hydrology
Module objectives/intended learning outcomes	After following this course students are expected to be able to: 1. Describe the definition of DAS as a unity of ecosystem as landscape and as hydrological system 2. Describe the watersheds of the air and population aspects as well as the ways related to the watershed 3. Explaining the management's understanding of the watershed should manage in an integrated manner and provide the basics of river basin management 4. Describe the management of watershed studies 5. Explain the hydrological parameters used to assess the criticality of the watershed

	6. Explain environmental parameters that can be used to criticize environmental aspects 7. Explain the concept of criticality of the watershed in order to assess the criticality of the watershed from the demographic aspect and to explain the population parameters to assess the criticality of the watershed 8. Describe the concept of spatial structuring and the importance of spatial planning in sustainable development 9. Describes the various protected areas, the legal basis of protected areas and the establishment of protected areas 10. Explain the role of land evaluation in managing the watershed 11. Describe the priority scale of management and how to determine the location 12. Describe ways of constructing matrixes and conservation alternatives 13. Describes land and air conservation techniques 14. Describes the baseline management of watershed organizations In an integrated manner 15. Describe the scope of watershed monitoring and evaluation 16. Describes flow monitoring and evolution techniques, air quality 17. Explain the techniques of land monitoring and evaluation
Content	1. Understanding watersheds 2. Problems and Identification of Watershed Problems 3. Basic of Watershed Management 4. Scope of Watershed Management Review 5. Criticality of watersheds from the hydrological aspect 6. Criticality of watersheds from land aspect 7. Criticality of watersheds from population aspect 8. The concept of spatial arrangement 9. Watersheds protected areas 10. The role of land evaluation in watershed management 11. Scale management area priorities 12. Land and water conservation techniques 13. The basic framework of the coefficient of integrated watershed management 14. The scope of watershed monitoring and evaluation 15. Water monitoring and evaluation techniques 16. Land monitoring and evaluation techniques 17. Population monitoring and evaluation techniques

Study and examination requirements and forms of examination	Individual assignment – written Midterm exam – written Attendance – summary from presence list Final exam – written and/or oral
Media employed	Online sources Computers Interactive video LCD projector
Reading list	Arie Dj. Djoekardi dan Bambang Setyabudi, 1998. Kebijaksanaan dan Strategi Nasional Pengelolaan Lingkungan Hidup Dalam Pembangunan Jangka Panjang Kedua. *Dasakarya Pengelolaan Lingkungan Hidup*. Kantor Menteri Negara Lingkungan Hidup. Jakarta. Asdak, C., 1995. *Hidrologi dan Pengelolaan Daerah Aliran Sungai*. Gadjah Mada University Press. Yogyakarta. Dewan Riset Nasional (DRN). 1994. *Kebutuhan Riset dan Koordinasi Pengelolaan Sumberdaya Air di Indonesia*. DRN. Kelompok II. Sumberdaya Alam dan Energi. Jakarta Hudson, N., 1995. *Soil Conservation*. Iowa State University. Horst, L., 1974. Hydrometri. *Internatiomal Courses in Hydraulic and Sanitary Engineering 3rd Ed*. Delft. Netherland. Morgan, RPC., 1995. *Soil Erosion and Conservation, 2nd Ed*. Longman. England. Newson, M., 1997. *Landwater and Development : Sustainable Management of River Basin System, 2nd Ed.* Routledge. London and New York. Sajogyo, 1984. Indeks Suatu Hidup. *Prisma*. LP3ES. Sitorus, S.R.P. 1995. *Evaluasi Sumberdaya Lahan*. Tarsito Bandung Soemarwoto, O. 1985. *A Quantitative Model of Population Pressure and Its Potential Use in development P*lanning. Majalah demografi Indonesia. No. 24 jakarta. Suyono, 1984. Pemantauan Pengelolaan Daerah Aliran Sungai Ditinjau dari Segi Hidrologi. *Proseding Seminar Hidrologi*. Peringatan Dies Natalis 32 Fakultas Geografi UGM. Suyono. 1996. *Pengelolaan Daerah Aliran dalam Konteks Hidrologi dan Kaitannya dengan Pembangunan Berkelanjutan*. Pidato Pengukuhan Jabatan Lektor Kepala Madya Pada Fakultas Geografi UGM Yogyakarta. Suyono. 1996. Peranan Stasiun Pengamat Arus Sungai Dalam Pengelolaan Daerah Aliran Sungai. *Makalah Seminar Tata Air dan Pembangunan Kehutanan yang*

	Berkelanjutan dalam Menyongsong Era Ecolabel pada Tahun 2000 di Kawasan Timur Indonesia. Departemen Kehutanan Indonesia Ujung Pandang. Suyono., 2001. Pengelolaan Daerah Aliran Sungai Terpadu dalam Rangka Pengendalian Tata Air Berwawasan Lingkungan. *Seminar Eco-Hydraulic*. Fakultas Teknik Jurusan Teknik Sipil UGM. Yogyakarta.