PROGRAM STUDI MAGISTER TEKNIK GEOMATIKA

MASTER OF GEOMATICS ENGINEERING

BUKU PEDOMAN MATA KULIAH

COURSES MODULE HANDBOOK

APLIKASI STATISTIKA DAN PROBABILITAS
APPLIED STATISTICS AND PROBABILITY

DEPARTEMEN TEKNIK GEOMATIKA
Fakultas Teknik Sipil, Perencanaan, dan Kebumian

DEPARTMENT OF GEOMATICS ENGINEERING
Faculty of Civil Engineering, Planning, and Geo Engineering

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

MATA KULIAH WAJIB
(*COMPULSORY COURSES*)

1. Aplikasi Statistika dan Probabilitas / *Applied Statistics and Probability*

Nama modul *Module name*	Aplikasi Statistika dan Probabilitas *Applied Statistics and Probability*
Tingkatan *Module level*	Pasca Sarjana (S2) *Master Degree*
Kode *Code*	CM235101
Mata kuliah *Course*	Aplikasi Statistika dan Probabilitas *Applied Statistics and Probability*
Semester *Semester*	I (satu) *I (one)*
Penanggung jawab mata kuliah *Person responsible for the module*	Ira Mutiara Anjasmara, S.T., M.Phil., Ph.D.
Dosen *Lecturer*	Ira Mutiara Anjasmara, S.T., M.Phil., Ph.D. Danar Guruh Pratomo, S.T., M.T., Ph.D.
Bahasa *Language*	Bahasa Indonesia dan Bahasa Inggris *Indonesian and English*
Relasi pada kurikulum *Relation to curriculum*	Mata kuliah wajib untuk Program Master Teknik Geomatika *Compulsory Courses for Master of Geomatics Engineering*
Tipe pertemuan, jam tatap muka *Type of teaching, contact hours*	Kuliah, 2.5 jam x 16 minggu per semester *Lecture, 2.5 hours x 16 weeks per semester*
Beban belajar *Workload*	Kuliah: 2.5 jam x 14 minggu = 35 jam Penugasan terstruktur: 5 jam x 14 minggu= 70 jam Kegiatan mandiri: 6 jam x 14 minggu = 84 jam Ujian: 2.5 jam x 2 kali = 5 jam Total = 194 jam *Lecture: 2.5 hours x 14 weeks = 35 hours* *Structured exercises and assignments: 5 hours x 14 weeks = 70 hours* *Independent activities: 6 hours x 14 weeks = 84 hours* *Exam: 2.5 hours x 2 time = 5 hours* *Total = 194 hours*
Kredit *Credits*	3 SKS *3 credits*
Persyaratan sesuai dengan peraturan ujian	Minimum 80% kehadiran untuk mengikuti ujian tertulis

Requirements according to the examination regulations	*Minimum 80% attendance in this course in order to take the exams*
Deskripsi Mata Kuliah	Pada matakuliah ini mahasiswa akan mereview kembali konsep statistika dan probabilitas serta mengaplikasikannya pada persoalan-persoalan di bidang geomatika. Selain itu mahasiswa juga diharapkan dapat mengaplikasikan tes statistik terutama sebagai validasi dalam penelitian. Mahasiswa juga akan mempelajari analisa regresi (trend analisis) untuk melakukan aproksimasi dan prediksi baik untuk data bivariate maupun multi variat dalam bidang geomatika. Analisa statistik untuk spasial-temporal data juga akan dipelajari dan diaplikasikan.
Description of Course	*In this course, students will review the concepts of statistics and probability and apply them to problems in the field of geomatics. In addition, students are also expected to be able to apply statistical tests, especially as validation in research. Students will also learn regression analysis (trend analysis) to make approximations and predictions for both bivariate and multivariate data in the field of geomatics. Statistical analysis for spatial-temporal data will also be studied and applied.*
Capaian Pembelajaran / Course *Learning Outcomes*	1. Mampu menerapkan teori dasar statistika dan probabilitas dalam persoalan dalam bidang geomatika. 2. Mampu menerapkan tes statistik dalam persoalan daalam bidang geomatika. 3. Mampu menerapkan analisa regresi untuk aproksimasi dan prediksi baik untuk data bivariate maupun multivariate dalam persoalan di bidang geomatika. 4. Mampu melakukan time-series analysis untuk persoalan dalam bidang geomatika. 5. Mampu menerapkan metode statistika untuk analisa data spasial-temporal dalam persoalan di bidang geomatika.
Module objectives / course learning outcomes	1. *Able to apply the basic theory of statistics and probability in problems in the field of geomatics.* 2. *Able to apply statistical tests in problems in the field of geomatics.* 3. *Able to apply regression analysis for approximation and prediction for both bivariate and multivariate data in problems in the field of geomatics.*

| | | 4. Able to perform time-series analysis for problems in the field of geomatics. |
| | | 5. Able to apply statistical methods for spatial-temporal data analysis in problems in the field of geomatics. |

CPMK dan hubungan dengan CPL Prodi *Learning outcomes and their corresponding to PLOs*		PLO.1	PLO.2	PLO.3	PLO.4	PLO.5	PLO.6	PLO.7	PLO.8	PLO.9
	CLO.1				✓					
	CLO.2				✓					✓
	CLO.3				✓					✓
	CLO.4				✓		✓			
	CLO.5				✓		✓			

Mata kuliah wajib prasyarat *Mandatory prerequisites*	-

Pokok Bahasan	Data Statistik, Distribusi Frekuensi, Ukuran Nilai Pusat, Regresi linier dan multivariable, Korelasi dan kovariansi, Aplikasi pengolahan data dan penyajian data metode analisa geostatistical (SIG), Aplikasi pengolahan data uji ketelitian citra satelit (Penginderaan Jauh), Probabilitas, Distribusi Normal, Disribusi t-student dan chi-square, Interval kepercayaan, Estimasi rata-rata dan variansi, Uji Statistik rata-rata dan variansi, Aplikasi pengujian data untuk SIG dan Penginderaan Jauh.
Content	*Statistical Data, Frequency Distribution, Central Values Size, Linear Regression and Multivariable, Correlation and Covariance, Data processing application and data presentation of geostatistical analysis method (GIS), Satellite Imagery Satisfaction Test, Satisfaction Probability, Normal Distribution, Distribution t-student and chi-square, Confidence interval, Average estimation and variance, Average statistical and variance test, Data testing application for GIS and Remote Sensing.*

Pembelajaran dan Persyaratan Ujian *Study and examination requirements and forms of examination*	**Rencana Evaluasi**	**Bobot** *Weight*
	Tugas dan presentasi 1 *Assignments and presentation 1*	15%
	Tugas dan presentasi 2 *Assignments and presentation 2*	15%
	Evaluasi Tengah Semester *Mid Semester Exam*	20%
	Tugas dan presentasi 3 *Assignment and presentation 3*	15%
	Tugas dan presentasi 4 *Assigment and presentation 4*	15%

	Evaluasi Akhir Semester *Final Semester Exam*	20%

Media yang digunakan *Media employed*	Classical teaching tools with white board and power point presentation
Daftar Pustaka *Reading list*	1. Johnson, R.A. and Bhattacharyya, G.K. 2010. Statistics Principles and Methods 6th Ed. 2. John Wiley & Sons. Mikhail,E.M., 1976. Analysis and Adjustment of Survey Measurements. Dun Donnelley Publisher New York. 3. Ghilani, C. and Wolf, P.R. 2006. Adjustment Computations: Spatial Data Analysis 4th Ed. 4. John Wiley & Sons. Heigerger, R.M. and B. Holland. 2009. Statistical Analysis and Data Display. 5. Springer Hengl, T. 2009. A Practical Guide to Geostatistical Mapping. Office for Official Publications of the European Communities, Luxembourg.