	SEMESTER LEARNING PLAN **DEPARTMENT OF GEOMATICS ENGINEERING** **FACULTY OF CIVIL, PLANNING, and GEO ENGINEERING**			
PROGRAM	**UNDERGRADUATE**			
COURSE NAME	**Spatial Database System**		**CODE**	**RM184308**
SEMESTER	**III (three)**		**CREDITS**	**3 (three)**
LECTURERS	**Yanto Budisusanto (coord.)**			
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COURSE MATERIALS	1	Concept of spatial database		
	2	Architecture and rules of spatial database		
	3	Basic concept of table		
	4	Spatial database design		
	5	Relational algebra on table		
	6	Languages used in rational spatial databases		
	7	Design spatial database system using one of SMBDS software and present its data in GIS tools (e.g. Open Jump, QGIS, ArcGIS, AutoCAD, etc.)		
EXPECTED LEARNING OUTCOMES THAT IMPOSED IN THE COURSE	D	Able to perform spatial data acquisition using modern measurement methods, geospatial data processing, using industry standard software, and making standard designs and analyzes in the fields of geodesy, surveying, hydrography, remote sensing, photogrammetry, and cadastral.		
	E	Able to apply information & communication technology and the latest technological developments in the fields of geodesy, surveying, hydrographic, remote sensing, photogrammetry, geographic information systems, and cadastral.		
COURSE LEARNING OUTCOMES	1	Able to use the concept and principle of database in order to identfiy the problems related to geomatics		
	2	Able to design and create spatial database system and analyze the data in term of general problem solutions related to geospatial information		
	3	Able to visualize spatial database using one of SIG tools (e.g. Open Jump, QGIS, ArcGIS, AutoCAD, etc.)		
	4	Able to arrange a report and present the result of spatial database design both orally and writing		
ABILITY CATEGORIES	*Cognitive Prosecess*	*Analyse*		
	Knowledge Domain	*Procedural*		
	Psychomotor	*Conscious control*		
	Affective	*Change of attitude*		

Class	Lesson learning outcome	Criteria dan Assessment Indicator	Weight	Learning Materials	Learning Experience	Learning Methods	Estimated Time
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	Able to explain the basic concept of spatial database system	Accuracy to give analogy examples related to daily activities	5,00%	1. Explanation of concept and anology	Lecture	Teacher-centered learning	1x(3x50')
				2. Discussion of examples in daily activities	Discussion	Student-centered learning	
				3. Explanation about the comprehension of concept and term	Literature review	Problem-based learning	
2	Able to explain about the database system architecture	Accuracy to give examples of structure/composition/architecture computer which is operating in stand alone and server from the database system perspective of hardware and software	5,00%	1. Spatial Database Management System (SDBMS)	Lecture and discussion (Task 1)	Teacher-centered learning	1x(3x50')
				2. Position of database programming			
				3. Implementation of database architecture	Literature review	Student-centered learning	
				4. Components of database system			
3	Able to explain about data model in database system	Accuracy to give examples for modelling of daily activities (real world)	10,00%	1. Data model	Practice to identify daily activities (real world) into data model	Problem-based learning	1x(3x50')
				2. Database schema	Lecture and discussion	Teacher-centered learning	
				3. Database architecture			
				4. Components of database management system	Literature review (Task 2)	Student-centered learning	
				5. Clasifications of database management system			
4-5	Able to create tables using database management system software	Accuracy to create tables using database management system tools with many ways and methods	15,00%	1. Concept of table 2. Data charactristics in tables	Lecture and discussion	Teacher-centered learning	2x(3x50')
				3.Data determination	Practical training to create tables using database management system software	Student-centered learning	
						Problem-based learning	
				4. Database (table) normalization	Task 3		

6-7	Able to create a relationship model between entities in order to process an event occurred in daily activities (real world) or to create a model from a work/event/routine in the organization	Accuracy to identify a relationship between entities and data modelling	10,00%	1. Data modelling approach 2. Entity relationship diagram (ERD) 3. Degree and relationship participation	Lecture and discussion	Teacher-centered learning	2x(3x50')
				4. Identification of real world to data model 5. Creating ERD	Practice (Task 4)	Student-centered learning	
				6. Design of physical database using SDBMS software	Practical training to create tables which are connected to each other based on the data rules		
8	Mid-Semester Evaluation					- Written evaluation	2x50'
						- Discussion	1x50'
9	Able to do step by step design of database system	Accuracy to apply steps of database design by the selected case studies	5,00%	1. The function of information system 2. Information processing (system) cycle 3. Database life (system) cycle	Lecture and discussion	Teacher-centered learning	1x(3x50')
				4. Design of database system	Practice to create design of database system	Problem-based learning	
10	Able to create queries in database	Accuracy to create examples of queries in database modelling	5,00%	1. The meaning of query 2. Identity constraints (primary/guest)	Lecture and discussion	Teacher-centered learning	1x(3x50')
				3. Operation types in tables	Practice to create examples of tables	Student-centered learning	
				4. Relational algebra in tables 5. Implementation of query	Practice to create examples of queries on tables		
11-12	Able to use SQL language for creating query in database	Accuracy to create query with SQL language which is suitable for the created database	5,00%	1. DDL (Data Definition Language), DML (Data Manipulation Language) and Query with SQL	Lecture and discussion	Teacher-centered learning	1x(3x50')
				2. Example and practice DDL, DML, and query using SQL by the operation of relational algebra in database	Practice	Student-centered learning	
				3. Implementation of DDL, DML, and query in database	Practical training (Task 5)	Problem-based learning	
				1. Concept and meaning of spatial database 2. Types and formats of spatial database	Lecture and discussion	Teacher-centered learning	

13-14	Able to input and visualize spatial data to spatial database	Accuracy to create input and visualize spatial database	10,00%	3. Transaction in spatial database	Literature review and presentation	Student-centered learning	2x(3x50')
				4. Spatial database operation on tables (spatial columns and input spatial data)	Practical training (Task 6)	Problem-based learning	
				5. Spatial query in spatial database			
				6. Visualization of spatial database			
15	Able to explore spatial database using GIS tools (license or opensource)	Accuracy to connect and visualize spatial database and to test two-way communication between many GIS tools and SDBMS	15,00%	1. The differences of SDBMS and geodatabase	Lecture and discussion	Teacher-centered learning	2x(3x50')
				2.Visualization of spatial database on many GIS tools	Practical training (Task 6)	Student-centered learning	
				3. Test two-way communication between SDBMS and GIS tools			
				4. Spatial query in SDBMS		Problem-based learning	
				5. Spatial query in GIS tools			
16	Final Semester Evaluation					Evaluation with a final presentation	1x(3x50')
						Total	16x(3x50')
0,85							