SEMESTER LEARNING PLAN
STUDY PROGRAM : BACHELOR OF MATHEMATICS EDUCATION
FACULTY : FACULTY OF EDUCATIONAL SCIENCES
UNIVERSITY OF PAHLAWAN TUANKU TAMBUSAI

SUBJECT	CODE	Study Material Group	WEIGHT (credits)	SEMESTER	Compilation Date
Numerical Method			**3**	**5**	**01-01-2021**

AUTHORIZATION	RPS Developer Lecturer	Head of KBK	Head of The Study Program
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Learning Outcomes (CP)	CP Study Program	
Notes : S: Attitude K : Knowledge GS: General Skills SS : Special Skill	A1	Fear of God Almighty and able to show a religious attitude;
	A2	Upholding human values in carrying out duties based on religion, morals, and ethics;
	A3	Internalize academic values, norms, and ethics;
	A7	Cooperate and have social sensitivity and concern for society and the environment;
	A8	Obey the law and discipline in the life of society and the state;
	A10	Demonstrate a responsible attitude towards work in their area of expertise independently.
	K1	Mastering the theoretical concepts of natural science, application of engineering mathematics, engineering principles, engineering science, and engineering design required for analysis of environmental problems and the design of environmental engineering and environmental management systems;
	SS2	Able to apply mathematics, statistics, physics, chemistry, biology, microbiology, and engineering principles to solve complex engineering problems in environmental management efforts including the management of basic living resources (water, air, soil) and liquid, solid waste control systems , or gases;
	GS1	Applying logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and/or technology following their field of expertise;
	GS2	Reviewing the implications of developing or implementing science, technology, or art following their expertise based on scientific principles, procedures, and ethics to produce solutions, ideas, designs, or art criticisms as well as compiling a scientific description of the results of the study in the form of a thesis or final project report;
	CP Courses	
	1	Able to calculate Taylor series and Error analysis
	2	Able to apply the bisection method
	3	Able to apply the False Regulation method, Newton Raphson, and Secant
	4	Able to apply Gauss Siedel and Pivot
	5	Able to apply Interpolation, Approximation, and Integral
	6	Be able to apply the Trapezoid rule with the trapezoid, Simpson, and Romberg rules

Brief Description Subject	The Numerical Method course discusses the basic concepts of numerical methods, Error, Closed Method: bisection method (bisection), Open Method: newton-Raphson method, secant method, false regulation, gauss seidel, gauss pivot, interpolation, approximation, integral both trapezoid, Simpson and Romberg.	
Learning Materials/ Subjects	1. Introduction to Numerical Methods 2. Taylor Series and Error Analysis 3. The bisection method (bisection) 4. False Regulation Method 5. Newton Rahpson method 6. Secant method 7. Gauss Siedel method 8. Gaussian Pivot Method 9. Interpolation 10. Approximation 11. Integral 12. Trapezoid Integral 13. Simpson's Integral 14. Romberg's integral	
References	**Main** Bober W. & Stevens A., Numerical and Analytical Methods with MATLAB for Electrical Engineers, CRC Press Taylor & Francis Group, 2013, London Chapra SC & Canale RP, Numerical Methods for Engineerings, McGraw-Hill, 2012, Singapore Yang WY, et al., Applied Numerical Methods Using Matlab, John Wiley & Sons, 2005, USA Djojodihardjo H., Numerical Method, Gramedia Pustaka Utama, 2000, Jakarta	
	Supporter	
Learning Media	**Software :**	**Hardware :**
	Powerpoint	LCD & Projectors, Modules
Team Teaching	-	
Assessment	-	
Requirements Course	-	

Implementation of Lectures 3 Credits

Week	Expected final ability	Study Material (Teaching Materials) And Reference	Learning Methods and Time Allocation	Student Learning Experience	Criteria (Indicators) Assessment	Rating Weight (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Students know the lesson plan for one semester and an introduction to numerical methods	Preliminary: General Competencies, RPS, & Introduction to numerical methods Reference: 1, 2, 3, 4	Lecturer presentation, Q&A, and assignments Assignment: About introduction to numerical methods 3 x 50 minute	Observing: the discourse contained in the learning material. Discuss: questions and problems that arise.	Indicator Explaining the syllabus Explaining the introductory concept of numerical methods	4
2	Students can calculate the Taylor series and error analysis	Taylor Series Error Analysis Reference: 1, 2, 3, 4	Lecturer presentation, Q&A, and assignments Assignment: about introduction to the Taylor series and error analysis 3 x 50 minutes	Observing: the discourse contained in the learning material. Discuss: questions and problems that arise.	Indicator Determining the Taylor Series Define Error Analysis Test form; Exercises	6
3,4,5,6, 7	Students can calculate the bisection method (divide), the False Regulation method, the Secant method, and the Gauss Siedel method	Bisection Method False Regulation Method secant method Gauss Siedel method Reference: 1, 2, 3, 4	Lecturer presentation, Q&A, and assignments Assignment: about the bisection method (divide), the False Regulation method, the Secant method, and the Gauss Siedel method 15 x 50 minutes	Observing: the discourse contained in the learning material. Discuss: questions and problems that arise.	Indicator Determining the Bisection Method Determining False Regulation Method Determining the Secant Method Determining the Gauss Siedel Method Test form; Exercises	15
8	Mid-Semester Exam	All materials from Meeting 1-7			Written test	25
9	Students can calculate the Gauss Pivot . method	Gaussian Pivot Method Reference: 1, 2, 3, 4	Lecturer presentation, Q&A, and assignments Assignment: about the Gauss Pivot . method 3 x 50 minutes	Observing: the discourse contained in the learning material. Discuss: questions and problems that arise.	Indicator Determining the Gauss Pivot Method Test form; Exercises	4
10,11,12	Students can calculate Interpolation, Approximation, and Integral	Interpolation Approximation Integral Reference: 1, 2, 3, 4	Lecturer presentation, Q&A, and assignments Assignment: about Interpolation,	Observing: the discourse contained in the learning material. Discuss: questions and problems that arise.	Indicator Determining Interpolation Determining the Approximation Determining Integral	13

Week	Expected final ability	Study Material (Teaching Materials) And Reference	Learning Methods and Time Allocation	Student Learning Experience	Criteria (Indicators) Assessment	Rating Weight (%)
			Approximation, and Integral 9 x 50 minutes		Test form; Exercises	
13,14,15	Students can calculate the Trapezoidal Integral, Simpson and Romberg	Trapezoid Integral Simpson's Integral Romberg's integral Reference: 1, 2, 3, 4	Lecturer presentation, Q&A, and assignments Assignment: about Interpolation, Approximation, and Integral 9 x 50 minutes	Observing: the discourse contained in the learning material. Discuss: questions and problems that arise.	Indicator Determining the Trapezoid Integral Determining Simpson's Integral Determining the Romberg Integral Test form; Exercises	13
16	Final Semester Exam (UAS)	All materials			Written test	30