Mathematics Workshop

Module Name	Course Module
Module Level	Bachelor Degree of Mathematics Education
Code, if applicable	3115-010-2
Sub-title, if applicable	
Courses, if applicable	Mathematics Workshop
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Lecturer of Courses
Lecturer (s)	Tian Abdul Aziz, Ph.D. Agus Agung Permana, S.Si.,M.Pd.
Language	Bahasa Indonesia
Relation to Curriculum	This course is a compulsory course and offered in the 5th semester.
Type of teaching, contact hours	Teaching methods used in this course is project-based learning (project development and presentation) The class size for lecture is 40 students. Contact hours for lecture is 26,67 hours
Workload	For this course, students required to meet a minimum of 90.67 hours in one semester for structured assignments and independent study,
Credit Points	3 ECTS / 2 CP
Requirements according to the examination regulations	Students should submit all scheduled group assignments
Recommended prerequisites	Programming Algorithm Learning on Mathematics for Elementary School Learning on Mathematics for Junior High School Learning on Mathematics for Senior High School
Program intended learning outcomes	PLO 4: Able to work together and have social sensitivity and concern for society and the environment. PLO 9: Able to use various learning resources and learning media in mathematics.

Course Learning Objectives	CLO 1: understand the math workshop. CLO 2: design and produce concrete math teaching aids (manipulative). CLO 3: design and produce virtual mathematics learning media.
Content	**Students will learn about:** 1. Introduction to mathematics workshops 2. Definitions, types, and examples of mathematical teaching aids 3. Design and production of concrete math teaching aids Design and production of virtual mathematics learning media.
Forms of Assessment	Assessment of the learning process according to the following components: Manipulatives 70% Virtual Tools 30%
Study and examination requirements and forms of examination	Students must submit all scheduled group assignments. **Form of examination:** project and presentation.
Media employed	Powerpoint presentation, internet, learning management system (LMS), and tools for producing manipulatives in workshops
Reading list	**Main Reference** • Buku Praktikum Workshop Matematika • https://www.hand2mind.com/resources/glossary-of-hands-on-manipulatives • https://p4tkmatematika.org/category/04info-unit/mediaalatperaga/ • https://www.teachermagazine.com.au/articles/teaching-resources-usingmanipulatives-in-mathematics-learning Sarama, J., & Clements, D. H. (2016). Physical and virtual manipulatives: What is "concrete"? In International perspectives on teaching and learning mathematics with virtual manipulatives (pp. 71-93). Springer, Cham.

Program intended learning outcomes

PLO 1. Able to uphold human values in carrying out duties based on religion, morals and ethics
PLO 5. Able to master the basics of mathematical theoretical concepts, including mathematical logic, discrete mathematics, algebra, analysis and geometry as well as probability theory and statistics

Course Learning Outcomes(CLO) to be achieved in this course are:

CLO 1 : Mastering the concept of sequences of real numbers and being able to determine their convergence
CLO 2 : Mastering the concept of number series, function series (power series) and can determine their convergence and understand Taylor and MacLaurin series
CLO 3 : Mastering the concept of Scalar Field, Gradient, Directed Derivative and Vector Field
CLO 4 : Mastering Vector Valued Functions from R to Rn and Rn to Rm as well as their operation and function composition
CLO 5 : Mastering the concept of Limit, Continuity, Derivative and Integral of Vector Valued Functions
CLO 6 : Mastering the concept of line integrals and able to use Green's Theorem
CLO 7 : Mastering the concept of Surface Integral and able to use Gaussian Divergence Theorem and Stokes Theorem

The relationship between PLO and CLO in this course is described as follows:

CLO	PLO	
	1	5
1		
2		
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Content	**Students will learn about:** 1. Sequence of Real Numbers 2. Row 3. Scalar Field, Gradient, Directed Derivative, Vector Field 4. Vector Valued Functions 5. Limit, Continuity, Derivative and Integral of Vector Valued Functions 6. Line Integral and Green's Theorem 7. Surface Integral, Gauss and Stokes Divergence Theorem
Forms of Assessment	Assessment of the learning process according to the following components: assignment 30%, mid exam 35%, final exam 35%.
Study and examination requirements and forms of examination	**Study and exam requirements:** - Students must be present 15 minutes before class starts. - Students must turn off all electronic devices. - Students are required to notify the lecturer if they are absent from class due to illness, etc. - Students must turn in all classwork before the exam deadline. - Students must take an exam to get a final grade. **Examination form:** Exam form: face to face and written
Media employed	laptops, Internet, LCDs, Whiteboard,Zoom/Google Class/Ms. Teams, and LMS

Reading List	3. Purcell, Varberg Rigdon, 2008, Calculus, Ninth Edition, Prentice Hall 4. Multivariable Calculus, Wono Setya Budhi, ITB. 5. Kreyzsig, Erwin., Advanced Engineering Mathematics. (Trans.). Erlangga Publisher, Jkt. Spiegel, Murray R. Advanced Calculus. (trans). 3rd Edition Erlangga Publisher, Jkt.