



KEMENTERIAN PENDIDIKAN TINGGI,
SAINS, DAN TEKNOLOGI
UNIVERSITAS LAMPUNG

FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN

Jalan Prof. Dr. Sumantri Brojonegoro No.1 Gedong Meneng - Bandar Lampung 35145

Telp./Fax: (0721) 704624 e-mail: fkip@unila.ac.id,

laman: <http://fkip.unila.ac.id>

Bachelor of Education in Physics

MODULE HANDBOOK

Module Name	Basic Mathematics
Module Level, if Applicable	Bachelor
Code	KIE616101
Sub-Heading, (*if Applicable)	-
Classes, (*if Applicable)	-
Description	Discusses knowledge of various methods and techniques of Physics Mathematics, and can use them in various problem solving processes, related to Physics problems. This lecture discusses material on various vector matrix equations and complex numbers and their applications in Physics. TPAC is integrated by implementing Online Mathematics Applications and Numerical Simulators with Cooperative Models and Interactive Activities on Basic Mathematics Concepts such as sets, real number systems, linear equations, functions, logic and Applications in Daily Life NOS is implemented in Mathematical Definitions and Structures, Mathematical Logic and Proof, Functions and Graphs, Equations and Inequalities. SSI is applied as in 1. Use of Statistical Data (Students can analyze data related to social issues such as pollution or public health. For example, using statistics to evaluate data on obesity rates in different age groups and relate them to social factors.) 2. Modeling and Simulation: Using mathematical models to simulate the impact of certain policies, such as reducing carbon emissions. This can involve differential equations or predictive models that show how policy changes can affect the environment. 3. Developing projects where students must use mathematical skills to solve real-world problems. For example, designing a survey to collect data on household energy consumption habits and analyzing the results.



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Semester	1st
Module Coordinator	Dr. Kartini Herlina, M.Si.
Lecturers	Team Teaching of Educational Psychology
Language	Indonesian/English
Classification With in the Curriculum	Compulsory Courses in the first year (1st semester) Bachelor Degree
Teaching Format/Class Hours Per Week During the Semester	Learning activity can be carried out in the form of Lecture or students' response a. Face to face : 50 minutes/SKS b. Structured activity : 60 minutes/SKS c. Independent activity : 60 minutes/SKS
Teaching methods	In class activity : Case Method Structured activity : Group Discussion Independent activity : Individual task
Workload	1 CU (SKS) for bachelor degree equal to 3 work hours per week or 170 minutes. 3x50 minutes face to face, 3x60 minutes structured tasks, 3x60 minutes independent learning, for 16 weeks (including midterm and final exam), a total of 136 hours/semester. One CU equals to 1.51 ECTS
Credit Points	3 CU (SKS) = 3 x 1.51 = 4.53 ECTS
Prerequisites Courses	-
Course Outcomes (CO)	PLO1: Demonstrate knowledge of classical physics (mechanics, electrodynamics, thermodynamics, oscillations, waves and optics) and are familiar with the fundamentals of quantum, atomic and molecular, nuclear, elementary particle and solid state physics. PLO3: Applying Technology, Pedagogy, and Content Knowledge (TPACK) in planning, teaching, and evaluating physics learning. PLO4: Using research methodology knowledge to solve physics education and learning problems.



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	CO1: Students are expected to be able to operate the real number system. CO2: Able to: operate on rational and irrational real numbers CO3: Able to understand and operate functions. CO4: Able to understand and be able to determine derivatives of functions. CO5: Able to determine the differential coefficient CO6: Able to solve differentials in the form of a function of a function. CO7: Able to solve differentials in the form of a function of a function. CO8: Able to complete differential functions of implicit and parametric equations. CO9: Able to solve partial differential problems CO10: Able to determine the differential inverse (integration) of a function. CO11: Able to solve partial integral and integrand problems with partial fractions CO12: Students are able to solve integrals using trigonometry CO13: Able to solve integrals in quadratic form.
Content	Rational and irrational real numbers, Inequality, Ineptitude with absolute value, Function operation, Composite functions, Functions and function limits, Derivatives of functions, Differential of multiplication forms, Differential of division forms, Differential function of a function x, Differential of implicit functions, Differential of parametric equations, Partial differential, Integration, Integral function of a function, Partial integral, Partial fractional integral.
Study/Exam Achievements	Midterm Exam 20% Final Exam 20% Assignment 10% Case study 50%



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	The initial cut - off points for grades A, B+ , B, C+ ,C, and D should not be less than 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, and 40%, respectively.
Examination Methods	1. Midterm Exam (UTS) ✓ UTS is held at the 8th meeting ✓ UTS is a written test in the form of objective and essay, and carried out in the classroom with an implementation time of 120 minutes according to the module schedule ✓ UTS is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Basic Mathematics module 2. Final Exam (UAS) ✓ UAS is held at the 16th meeting ✓ UAS is a written test in the form of objective and essay, and carried out in the classroom with an implementation time of 120 minutes which follows the UAS implementation schedule of the department ✓ UAS is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Basic Mathematics module. 3. Assignments ✓ Assignments are given as individual tasks or group tasks and submitted in a limited time. ✓ The assignments are carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Basic Mathematics module. 4. Rubric for Case Study ✓ Case study is given as group task in analyzing case studies and problems



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	✓ Case study is carried out for one semester and presented at the end of semester ✓ Case study is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Basic Mathematics module.
Forms of Media	LCD, whiteboard, and online resources
Literature	1. Calculus and analytical geometry vol. 1 C.. J. Purce 2. Amir, M. F., & Prasajo, B. H. (2021). <i>Buku Ajar Matematika Dasar</i>. UMSIDA Press. ISBN: 978-979-3401-66-9. 3. Rasyid, S. (2023). <i>Buku Ajar Matematika Dasar</i>. PT Media Penerbit Indonesia. 4. Utami, D., & Santoso, H. (2022). <i>Aljabar dan Fungsi dalam Matematika Dasar</i>. Penerbit Bumi Aksara. ISBN: 978-602-4334-567. 5. Pramudito, R., & Kusnadi, E. (2023). <i>Geometri dan Trigonometri Dasar</i>. Penerbit Salemba Empat. ISBN: 978-979-27-1234-7. 6. Sari, D. P., & Hidayati, N. (2023). <i>Dasar-Dasar Matematika untuk Pendidikan Dasar</i>. Penerbit Erlangga. ISBN: 978-979-20-1234-5. 7. Supriyadi, A., & Setiawan, B. (2022). <i>Matematika Dasar: Teori dan Aplikasi</i>. Graha Ilmu. ISBN: 978-602-430-123-4.



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PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
CO 1	✓										
CO 2			✓								
CO 3	✓										
CO 4	✓										
CO 5	✓										
CO 6	✓										
CO 7	✓										
CO 8	✓										
CO 9	✓										
CO 10	✓										
CO 11	✓										
CO 12	✓										
CO 13				✓							

