# UNIVERSITAS NEGERI YOGYAKARTA

FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF MATHEMATICS EDUCATION

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**Bachelor of Science in Mathematics**  **MODULE HANDBOOK**

| | |
|---|---|
| Module name: | Advanced Calculus |
| Module level,if applicable: | Undergraduate |
| Code: | MAT6313 |
| Sub-heading,if applicable: | - |
| Classes,if applicable: | - |
| Semester: | 3$^{rd}$ |
| Module coordinator: | Dr. Sugiman |
| Lecturer(s): | 1.  Dr. Sugiman<br>2.  EminugrohoRatnasari,M.Sc. |
| Language: | Bahasa Indonesia |
| Classification within the curriculum: | Compulsory course |
| Teaching format /  class hours perweek during the semester: | 150 minutes lectures and 180 minutes structured activities per week. |
| Workload: | Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes self-study per week for 16 weeks. |
| Creditpoints: | 3 |
| Prerequisites course(s): | Integral Calculus (MAT6307) |
| Courseoutcomes: | After taking this course the students have ability to:<br>CO1. Demonstrate collaborative attitude and independence in carrying out individual tasks and group assignments<br>CO2.Communicate ideas in solving mathematical problems in writing or verbally |

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|---|---|
| | CO3. Describe concepts and methods about continuity of function, partial derivative and multiple integral<br>CO4. Applying concepts and methods about partial derivative and multiple integral<br>CO5. Explore and proof theorems about convergence sequence<br>CO6. Modelling real problem using multiple integral and interpreting |
| Content: | This course discusses the sequences, infinite series, convergence tests of the sequences and series, divergence tests of the sequences and series, Taylor series, functions of two variables, limit and continuity of functions of two variables, derivatives of functions of two variables, directional derivatives, maximum and minimum, the chain rule, Lagrange method, multiple integrals in Cartesian as well as in polar coordinates, the applications of multiple integrals in finding the volume of a solid or the area of a surface |
| Study/exam achievements: | CO1: Attitude assessment is carried out at each meeting by observation and / or self-assessment techniques using the assumption that basically every student has a good attitude. The student is given a value of very good or not good attitudeif they show it significantlycompared to other students in general. The result of attitude assessment is not a component of the final grades, but as one of therequirements to pass the course. Students will pass from this course if at least have a good attitude.<br><br>The final mark will be weight as follow: |

| No | CO | Assesment Object | Assessment Techniques | Weight |
|---|---|---|---|---|
| 1 | CO1, CO2, CO 3,CO4,CO 5,CO6, and CO 7 | a. Individual assignments<br>b. group assignments<br>c. Quiz<br>d. MID<br>e. Final Exam | Written test | 15%<br><br>10%<br>20%<br>25%<br>30% |
| | | | Total | 100% |

| Forms of media: | Board, LCD Projector, Laptop/Computer |
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| Literature: | 1. Sugiman. 2013. Kalkulus Lanjut. Hand Book. <br> 2. Purcell, Edwin J. dan Varberg, D. 1987. Kalkulus dan Geometri Analitis, Jilid 2. Edisi kelima. Penerjemah: I Nyoman Sulila, Bana Kartasasmita, dan Rawuh. Jakarta: Penerbit Erlangga. <br> 3. Larson, Hestetler, and Edwards. 2008. *Essensial Calculus: EralyTrancendental Functions*. Boston: Houghtin Mifflin Company. |

## PLO and CO mapping

| | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 | PLO9 | PLO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | ✓ | | | | | | | | |
| CO2 | | | ✓ | | | | | | | |
| CO3 | | | | | ✓ | | | | | |
| CO4 | | | | | | ✓ | | | | |
| CO5 | | | | | | ✓ | | | | |
| CO6 | | | | | | | ✓ | | | |