UNIVERSITAS INDONESIA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Building D, Kampus UI Depok 16424, Telp: 021 - 7863439,
Email: sekretariat.math@sci.ui.ac.id, website: https://www.math.ui.ac.id/

MODULE HANDBOOK

Module designation	*Measure theory and integration*
Semester(s) in which the module is taught	6
Person responsible for the module	*Dr. Hengki Tasman*
Language	*Indonesian*
Relation to curriculum	*Elective*
Teaching methods	*Discussion*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload: 9 hours/week x 14 weeks + 5.5 hours/week x 2 weeks = 137 hours.* *Contact hours: 3 hours (150 minutes lectures).* *Private study including examination preparation, specified in hours[1]:* *3 hours structured activities and 3 hours individual study per week.*
Credit points	*3 SKS (4.77 ECTS)*
Required and recommended prerequisites for joining the module	*Analysis 2*
Module objectives/intended learning outcomes	*After completing the course, students have the ability* 1. *to determine the solution of problems in measurable function,* 2. *to determine the solution of problems in measure,* 3. *to determine the solution of problems in integral,* 4. *to determine the solution of problems in integrable function,* 5. *to determine the solution of problems in Lebesgue space,* 6. *to determine the solution of problems in convergence,* 7. *to determine the solution of problems in measure decomposition.*

[1] When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content	1. *Measurable real valued functions, generalized measurable real valued functions, measurable complex valued functions, function between measurable spaces,* 2. *Measure, measurable space, almost everywhere, charge.* 3. *Simple function and its integral, integral of generalized measurable real valued functions, Theorem of Monotone Convergence, Lemma Fatou, properties of integral,* 4. *Integrable real valued functions, positivity and linearity of integral, Lebesgue Dominance Convergence Theorem, parameter depended integrand,* 5. *Norm space, Lp-space, Holder inequality, Minkowski inequality, Theorem of completeness, L infinity-space,* 6. *Types of convergence of function sequence, relation between types of convergence,* 7. *Types of measure decomposition,*
Examination forms	1. *Quiz* 2. *Presentation* 3. *Mid-term examination* 4. *Final examination*
Study and examination requirements	*The final mark will be weighted as follows:* 1. *Quiz (20%)* 2. *Presentation assignment (30%)* 3. *Mid-term examination (25%)* 4. *Final examination (25%)* *To succesfully pass the module it requires minimum 55% of the total mark.* *Mark — Grade* *85—100 — A* *80—<85 — A-* *75—<80 — B+* *70—<75 — B* *65—<70 — B-* *60—<65 — C+* *55—<60 — C* *40—<55 — D* *<40 — E*
Reading list (resources)	1. *Robert G. Bartle, The elements of integration and Lebesgue measure, John Wiley & Sons, 1966.* 2. *Lecturer's Handout*