UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: http://math.fmipa.ugm.ac.id

Doctor in Mathematics
Telp : +62 274 552243
Email : maths3@ugm.ac.id; kaprodi-s3-matematika.mipa@ugm.ac.id
Website : http://s3math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module Name	*Topics in Measure and Integral Theory*
Module level, if applicable	*Doctor*
Code, if applicable	*MMM-7106*
Subtitle, if applicable	-
Semester(s) in which the module is taught	*1st or 2nd semester*
Person responsible for the module	*Chair of the Lab. of Analysis*
Language	*Bahasa Indonesia*
Relation to curriculum	*Elective course in the 1st or 2nd semester of doctor's degree*
Teaching methods	*Lecture, classroom discussion, flipped classroom.*
Workload (incl. contact hours, self-study hours)	*Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.*
Credit points in Credit Units	*3*
Required and recommended prerequisites for joining the module	*Students have strong knowledge on set theory and Riemann integral.*
Module objectives/intended learning outcomes	*After completing this course, the students should have the ability to:* CO 1 prove the properties of measure and the associated integral, both Lebesgue and in general. CO 2 prove the properties of the absolute or non-absolute integrals. CO 3 prove the convergence theorems in the integral.

Content	*It will be derived from research topic of the students. It will be focused on* the measure and the associated integral, both Lebesgue and in general either on absolute and non-absolute integrals.
Examination forms	*Oral presentation, essay.*
Study and examination requirements	*The final mark will be weighted as follows:* *No* — *Assessment methods (components, activites)* — *Weight (percentage)* *1* — *Final Examination (essay/oral presentation)* — *35%* *2* — *Mid-Term Examination (essay/presentation)* — *35%* *3* — *Class Activities: Presentation/Quiz* — *30%* *To pass the course, the minimum grade is B.*
Media employed	*Board, LCD Projector, Laptop/Computer*
Reading list	1. Royden, H.L, 1988, *Real Analysis*, 3th edition, Macmillan Publishing Company. 2. Lee Peng Yee, 1989, *Lanzhou Lectures on Henstock integration*, World Scientific, Singapore. 3. Lee P.Y. and Výborný, R., 2000, *Integral: An Easy Approach after Kurzweil and Henstock*, Cambridge University Press. 4. Bartle, R.G, 2001, *A Modern Theory of Integration*, Graduate Studies in Mathematics, AMS Series, Volume 32. 5. Pfeffer, W.F., 1993, *The Riemann Approach to Integration*, Cambridge University Press, New-York, USA.

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1	v	v	v			v
CO 2	v	v	v			v

Last Modified Date : 11 August 2022

UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: http://math.fmipa.ugm.ac.id

Doctor in Mathematics
Telp : +62 274 552243
Email : maths3@ugm.ac.id; kaprodi-s3-matematika.mipa@ugm.ac.id
Website : http://s3math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module Name	*Topics in Measure and Integral Theory*
Code, if applicable	*MMM-7106*
Subtitle, if applicable	*Measure and Integral Theory*
Semester(s) in which the module is taught	*1st or 2nd semester*
Person responsible for the module	*Chair of the Lab. of Analysis*
Language	*Bahasa Indonesia*
Relation to curriculum	*Elective course in the 1st or 2nd semester of doctor's degree*
Teaching methods	*Lecture, classroom discussion, flipped classroom, project*
Workload (incl. contact hours, self-study hours)	*Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.*
Credit points in Credit Units	*3*
Required and recommended prerequisites for joining the module	*Students have strong knowledge on set theory and Riemann integral.*
Module objectives/intended learning outcomes	*After completing this course, the students should have the ability to:* CO 1 prove the properties of measure and the associated integral, both Lebesgue and in general. CO 2 prove the properties of the absolute integral. CO 3 prove the convergence theorems in the integral.

Content	*Sigma-Algebra,* measure and the associated integral, both Lebesgue and in general. Some properties of the integral, some convergence theorems.
Examination forms	*Oral presentation, essay, portfolio/writing a report of the project*
Study and examination requirements	*The final mark will be weighted as follows:* *No* — *Assessment methods (components, activities)* — *Weight (percentage)* *1* — *Final Examination (essay/oral presentation)* — *35%* *2* — *Mid-Term Examination (essay/presentation)* — *35%* *3* — *Class Activities: Presentation/Quiz* — *30%* *To pass the course, the minimum grade is B.*
Media employed	*Board, LCD Projector, Laptop/Computer*
Reading list	1. Royden, H.L, 1988, *Real Analysis*, 3th edition, Macmillan Publishing Company. 2. Salamon, D.A., 2020, Measure and Integration, ETH Zürich 3. Halmos, P.R., 1974, Measure Theory, Springer-Verlag.

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1	v	v	v			v
CO 2	v	v	v			v

Last Modified Date : 4 Septembe 2023

UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: http://math.fmipa.ugm.ac.id

Doctor in Mathematics

Telp : +62 274 552243
Email : maths3@ugm.ac.id; kaprodi-s3-matematika.mipa@ugm.ac.id
Website : http://s3math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module Name	*Topics in Measure and Integral Theory*
Code, if applicable	*MMM-7106*
Subtitle, if applicable	*Non-Absolute Integral*
Semester(s) in which the module is taught	*1st or 2nd semester*
Person responsible for the module	*Chair of the Lab. of Analysis*
Language	*Bahasa Indonesia*
Relation to curriculum	*Elective course in the 1st or 2nd semester of doctor's degree*
Teaching methods	*Lecture, classroom discussion, flipped classroom, project*
Workload (incl. contact hours, self-study hours)	*Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.*
Credit points in Credit Units	*3*
Required and recommended prerequisites for joining the module	*Students have strong knowledge on set theory and Riemann integral.*
Module objectives/intended learning outcomes	*After completing this course, the students should have the ability to:* CO 1 prove the properties of the non-absolute integrals on $[a, b]$. CO 2 prove the convergence theorems in the integral, especially of the Kurzweil-Henstock integral.

Content	*Development of the integral: from absolute to non-absolute;* *The existence of the delta-partition;* *Definition and some properties of the Kurzweil-Henstock integral: Henstock's Lemma, Harnack's Extension, Cauchy's Extension, primitive and its characteristics, relationship with other non-absolute integrals (the Specific Denjoy integral and Perron integral);* *Some convergence theorems: Fatou's Lemma, Dominated Convergence Theorem, Mean Convergence Theorem, Controlled Convergence Theorem.*
Examination forms	*Oral presentation, essay/writing the report of the project.*
Study and examination requirements	*The final mark will be weighted as follows:* *No* — *Assessment methods (components, activites)* — *Weight (percentage)* *1* — *Final Examination (essay/oral presentation)* — *35%* *2* — *Mid-Term Examination (essay/presentation)* — *35%* *3* — *Class Activities: Presentation/Quiz* — *30%* *To pass the course, the minimum grade is B.*
Media employed	*Board, LCD Projector, Laptop/Computer*
Reading list	1. Royden, H.L, 1988, *Real Analysis*, 3th edition, Macmillan Publishing Company. 2. Lee Peng Yee, 1989, *Lanzhou Lectures on Henstock integration*, World Scientific, Singapore. 3. Lee P.Y. and Výborný, R., 2000, *Integral: An Easy Approach after Kurzweil and Henstock*, Cambridge University Press. 4. Bartle, R.G, 2001, *A Modern Theory of Integration*, Graduate Studies in Mathematics, AMS Series, Volume 32. 5. Pfeffer, W.F., 1993, *The Riemann Approach to Integration*, Cambridge University Press, New-York, USA.

CO-PLO Mapping

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**
CO 1	**v**	**v**	**v**			**v**
CO 2	**v**	**v**	**v**			**v**

Last Modified Date : 4 September 2023