UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Mathematics Department
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Doctor in Mathematics
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MODULE HANDBOOK

Module name	Topics in Function and Sequence Spaces
Module level, if applicable	Doctor
Code, if applicable	MMM 7109
Subtitle, if applicable	
Semester(s) in which the module is taught	1st (fisrt)
Person responsible for the module	Chair of Analysis Research Group
Language	Bahasa Indonesia
Relation to curriculum	Doctor Degree, Elective course, 1st (first) semester
Type of teaching, contact hours	3 hours lectures, 3 hours structured activities.
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*
Requirements according to the examination regulations	--
Recommended prerequisites	--.
Module objectives/intended learning outcomes	After completing this course the students have ability to: CO 1. justify and prove some concepts related to function spaces and sequence spaces. CO 2. combine some properties in function spaces or sequence spaces to solve some problems related to function spaces and sequence spaces.
Content	Sequence Spaces: • The spaces c_0, c, bv, ℓ_p $(1 \leq p < \infty)$, and, ℓ_∞. • An Orlicz function and its properties. • Orlicz spaces and modular spaces. • Normed spaces and F-normed spaces. • Sequence spaces defined by an Orlicz function. Function spaces: • Spaces of bounded variation and absolutely continuous functions. • the Lebesgue spaces. • An Orlicz function and its properties. • Orlicz spaces and modular spaces. • Normed spaces and F-normed spaces. • The spaces of funtions defined by an Orlicz function.

Study and examination requirements and forms of examination	The final mark will be weighted as follows: No Assessment methods (components, activities) Weight (percentage) 1 Final Examination 45% 2 Mid-Term Examination 30% 3 Class Activities: Quiz, Homework, etc 25% To pass the course, students are expected to get a minimum grade of B.
Media employed	Board, LCD Projector, Laptop/Computer
Reading List	1. Lindenstrauss, J. and Tzafriri, L., 1996, *Classical Banach Spaces I and II*, Springer. 2. Musielak, J., 1983, *Orlicz Spaces and Modular Space*, Springer Verlag, 3. Halsey L. Royden, and Patrick M. Fitzpatrick, 2010, *Real Analysis*, 4th Edition, Prentice Hall.

CO – PLO Mapping

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

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MODULE HANDBOOK

Module designation	*Topics in Function and Sequence Spaces*
Code, if applicable	*MMM-7109*
Subtitle, if applicable	*Function Spaces*
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:* *-theory in algebra, especially vector space, linear independence set, and orthonormal basis.* *-measure theory and integrations.*
Module objectives/intended learning outcomes	*After completing this course the students have ability to:* *CO 1. justify and prove some concepts related to function spaces.* *CO 2. combine some properties in function spaces to solve some problems related to function spaces.*

<table>
<tr><td>Content</td><td>

Spaces of bounded variation and absolutely continuous functions.
the Lebesgue spaces.
An Orlicz function and its properties.
Orlicz spaces and modular spaces.
Normed spaces and F-normed spaces.
The spaces of funtions defined by an Orlicz function.

</td></tr>
<tr><td>Examination forms</td><td>Oral presentation, essay.</td></tr>
<tr><td>Study and examination requirements</td><td>The final mark will be weighted as follows:
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<tr><td>2</td><td>Mid-Term Examination : presentation/oral exam/essay</td><td>30-40%</td></tr>
<tr><td>3</td><td>Class Activities: presentation, quiz, homework, etc.</td><td>20-30%</td></tr>
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CO-PLO Mapping

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

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Last Modified Date:
September 04, 2023.

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MODULE HANDBOOK

Module designation	*Topics in Function and Sequence Spaces*
Code, if applicable	*MMM-7109*
Subtitle, if applicable	*Sequence Spaces*
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:* *-theory in algebra, especially vector space, linear independence set, and orthonormal basis.* *-sequence, series, and summability.*
Module objectives/intended learning outcomes	*After completing this course the students have ability to:* *CO 1. justify and prove some concepts related to sequence spaces.* *CO 2. combine some properties in function spaces to solve some problems related to sequence spaces.*

<table>
<tr><td>Content</td><td>

The spaces $c_0, c, bv, \ell_p\ (1 \le p < \infty), and, \ell_\infty$.
An Orlicz function and its properties.
Orlicz spaces and modular spaces.
Normed spaces and F-normed spaces.
Sequence spaces defined by an Orlicz function.

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

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