UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Mathematics Department
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

Undergraduate Programme in Mathematics
Telp : +62 274 552243
Email : maths1@ugm.ac.id; kaprodi-s1-matematika.mipa@ugm.ac.id
sekprodi-s1-matematika.mipa@ugm.ac.id
Website : http://s1math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module name	Introduction to Functional Analysis
Module level, if applicable	Bachelor
Code, if applicable	MMM- 4102
Subtitle, if applicable	-
Courses, if applicable	Introduction to Functional Analysis
Semester(s) in which the module is taught	7th (seventh)
Person responsible for the module	Chair of Lab. of Analysis
Lecture(s)	Prof. Dr. Soeparna Darmawijaya
Language	Bahasa Indonesia
Relation to curriculum	Bachelor Degree, Elective Course, 7th Semester
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points	3
Requirements according to the examination regulations	Students have taken Introduction to Functional Analysis course (MMM-4102) and have an examination card where the course is stated on.
Recommended prerequisites	Students have taken the course of Introduction to Analysis I course (MMM-3101) and have participated in the final exam of the course. Students should take Introduction to Analysis II (MMM-3102) at least in the same semester.
Module objectives/intended learning outcomes	After completing this course the students have ability to: CO 1. analyze the vector spaces of finite and infinite dimension, pre-Hilbert spaces, and norm-spaces. CO 2. analyze the orthogonality of two vectors, orthogonal system, and orthonormal system. CO 3. analyze the subspaces, orthogonally complement, direct sum. CO 4. analyze the properties of linear operator, the spaces L(V,W) and B(V,W), and dual spaces. CO 5. analyze self-adjoint operators and projections.
Content	• Vector spaces of finite and infinite dimension. • Pre-Hilbert spaces and norm spaces. • Orthogonal and orthonormal. • Subspaces, orthogonally complement, direct sum. • Transformation, linear operator. • The spaces L(V,W) and B(V,W) and dual spaces. • Self adjoint operator and projection..

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% The initial cut off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.
Media employed	White-board
Reading List	1. Erwin Kreyzig, 2007, *Introductory Functional Analysis with Applications*, Willey. 2. Orlicz, 1992, *Linear Functional Analysis,* world Scientific, Singapore. 3. Frigyes Riesz and Béla Sz-Nagy, 1990, Functional Analysis, *Translated from the* 2nd Edition by Leo F. Boron, Dover Publications, Inc, New York. 4. Sterling Khazag Berberian, 1976, *Introduction to Hilbert Space*, Oxford University Press, New York.

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1			v			v	v		
CO 2			v			v	v		v
CO 3						v	v		v
CO 4						v	v		v
CO 5						v	v		v