



DE LA SALLE UNIVERSITY – MANILA
COLLEGE OF SCIENCE
Mathematics Department

SYLLABUS

COURSE CODE	MTH741M/D
COURSE TITLE	Real Analysis 2
CLASS DAY & TIME	
ROOM	
NAME OF FACULTY	
COURSE CREDIT	3 Units
CONTACT NO. (DEPT)	(02) 536-0270, (02) 524-4611 loc. 420/413
TERM/SCHOOL YEAR	

COURSE DESCRIPTION

This course discusses measure and integration. In particular, it focuses on Lebesgue integration, some differentiation, and a few additional topics, if time permits.

COURSE OBJECTIVES

1. Introduce algebras and σ -algebras.
2. Provide a sufficient background on measure, measurable sets, measurable spaces, and measurable functions.
3. Introduce the abstract concept of integration.
4. Discuss the relationship between the Riemann and the Lebesgue integrals.
5. Discuss differentiation and introduce the indefinite integral.
6. Instill values like:
 - cooperation through group study;
 - honesty by claiming credit only for the work he has done;
 - patience, perseverance and diligence by solving assigned exercises completely including the difficult ones;
 - faith by doing what is right and giving his best in performing any assigned task;
 - concern for the community through sharing of know-how and resources during group discussion;
 - self-reliance by being able to solve problems independently.

Topic/Subtopic	Learning Strategies/ Activities	Week/Meeting
1. Measures 1.1 Algebras, σ -algebras, and Borel sets. 1.2 Outer measure	Lecture-Discussions Report Problem Solving	9 hrs

Topic/Subtopic	Learning Strategies/ Activities	Week/Meeting
1.3 Measurable sets and Lebesgue measure		
2. Integration 2.1 Measurable spaces and measurable functions. 2.2 Integration of simple functions 2.3 The Lebesgue integral 2.4 Convergence Theorems	Lecture-Discussions Report Problem Solving	15 hrs
3. Differentiation 3.1 Vitali's Lemma. 3.2 Derivates and the derivative. 3.3 Functions of bounded variation 3.4 The indefinite integral. 3.5 Absolute continuity.	Lecture-Discussions Report Problem Solving	12 hrs
4. Additional Topics 4.1 Classical Banach spaces. 4.2 Baire Category. 4.3 Arzela-Ascoli Theorem	Lecture-Discussions Report Problem Solving	3 hrs
FINAL EXAMINATION		3 hrs

COURSE REQUIREMENTS

- Examinations
- Problem Sets

SOURCES

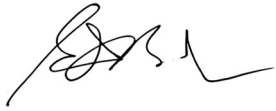
TEXTBOOK

- Royden, H.L., *Real Analysis*, 3rd ed, New York: Macmillan , 1988.

REFERENCES

- Ambrosio, Luigi, *Introduction to Measure Theory and Integration* [electronic resource], Pisa : Edizioni della Normale, 2011.
- Bartle, Robert, *The Elements of Integration and Lebesgue Measure*, New York : Wiley; 1995
- Bridger, Mark, *Real Analysis: a constructive approach*, Hoboken, N.J. : Wiley, 2012.
- Kharazishvili, Alexander B., *Topics in Measure Theory and Real Analysis*, Paris: Atlantis Press, 2009.
- Klambauer, Gabriel, *Real Analysis*, Mineola, N.Y. : Dover Publications, 2005.

Noted by:

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