DE LA SALLE UNIVERSITY – MANILA
COLLEGE OF SCIENCE
Mathematics Department

SYLLABUS

COURSE CODE	MTH641M/D
COURSE TITLE	Real Analysis 1
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

The first part of the course discusses the real number system and its properties, including some topological properties. The second part of the course tackles the more general notion of metric spaces. Continuity of functions and convergence of sequences are also discussed.

COURSE OBJECTIVES

1. Discuss the essential properties that define the real number system.
2. Define the concepts of open sets, closed sets, and compact sets.
3. Define continuity and uniform continuity of functions.
4. Discuss sequences and various properties, particularly convergence.
5. Define metric spaces and its properties, including various forms of compactness.
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. Preliminary concepts 1.1 Sets and operations on sets. 1.2 Functions. 1.3 Countable sets. 1.4 Relations and orderings. 1.5 Axiom of Choice	Lecture-Discussions Report Problem Solving	12 hrs
2. The Real Number System 2.1 Field Axioms and Order Axioms. 2.2 The Completeness Axiom 2.3 Sequences, The Cauchy convergence criterion 2.4 Some topological concepts 2.5 Continuous functions, The Extreme Value Theorem, and The Intermediate Value Theorem	Lecture-Discussions Report Problem Solving	15 hrs
3. Metric spaces 3.1 Definition of metric spaces and examples. 3.2 Metric space topology. 3.3 Convergence and completeness 3.4 Continuous functions. 3.5 Subspaces 3.6 Compact metric spaces.	Lecture-Discussions Report Problem Solving	12 hrs
FINAL EXAMINATION		3 hrs

COURSE REQUIREMENTS

- Examinations
- Problem Sets

SOURCES
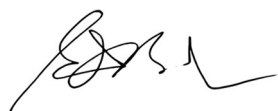
TEXTBOOK

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

REFERENCES

- Ash, Robert B, *Real Variables with Basic Metric Space Topology*, Mineola, N.Y : Dover Publications, 2009.

- Bloch, Ethan D, *The Real Numbers and Real Analysis* [electronic resource], New York, NY : Springer New York, 2011.

- Bachman, David, *Advanced Calculus Demystified: a self-teaching guide,* New York : McGraw-Hill, 2007.

- Graves, Lawrence Murray, *The Theory of Functions of Real Variables,* Mineola, N.Y.: Dover Publications, 2009.

- Krantz, Steven George, *A Guide to Real Variables,* [Washington, D.C.] : Mathematical Association of America, 2009.

Noted by:

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