

Department of Mathematics

Faculty of Science

MATH 731 (206731) REAL ANALYSIS I

3(3-0-6)

Prerequisite Consent of the instructor

Course Descriptions :

Rigorous treatment of topics such as sequences, series and uniform convergence. Differentiation and Lebesgue theory of integration.

Course Contents

No. of Lecture Hours

1. Sequences and series of functions

9

- Sequence of functions
- Convergence
- Uniform convergence
- Cauchy criterion for uniform convergence
- Uniform convergence and continuity, differentiation and integration
- Series of functions
- Absolute and uniform convergence
- Test for uniform convergence
- Power series
- Cauchy-Hadamard Theorem

2. Lebesgue measure

10

- Lebesgue outer measure
- Properties of Lebesgue outer measure
- Measurable sets
- Cantor sets
- Lebesgue measure
- Cantor set with positive measure

3. Measurable functions

8

- Lebesgue measurable function
- Sequence of measurable function
- Simple function
- Convergence in Measure
- Convergence almost everywhere

Course Contents	No. of Lecture Hours
4. Integration	10
- Integration of nonnegative measurable functions	
- Integration of measurable functions	
- Monotone convergence theorem	
- Dominated convergence theorem	
- Comparison with the Riemann integral	
5. Differentiation	8
- Function of bounded variation	
- Integration and differentiation	
- Integration by parts	

คำอธิบายรายวิชาในเล่มหลักสูตร

การศึกษาในแนวคิดเกี่ยวกับหัวข้อต่างๆ ได้แก่ ลำดับ อนุกรมและการลู่ออกเข้าสู่มำเสมอ อนุพันธ์ และ ทฤษฎีเลอเบสก์ของอินทิเกรชัน