

Al al-Bayt University

Faculty of Science

Mathematics Department

Calculus 1 (401101)

First Semester - 2017/2018

Lecturer: Dr.



☒ Text Book

Howard Anton, IrI C. Bivens and Stephen Davis, Calculus, Late Transcendentals, 9th Edition, Wiley.

☒ Recommended References

- 1) Salas, Hille & Etgen , Calculus .
- 2) Thomas and Finney, Calculus .

☒ Course Objectives

- Learn the concept of functions and inverse functions.
- Understand the concept of limits and its related topics such as continuity and the continuity of Trigonometric functions.
- Learn the techniques of differentiation of functions such as polynomials, trigonometric functions. Then learn to apply the chain rule and the implicit differentiation.
- Study the behavior of the function through exploring its first and second derivatives. Study Rolle's and the Mean value theorems.
- Understanding the concept of integration, compute the definite and indefinite integrals by substitution. Study the Fundamental theorem of calculus.
- Study the derivatives and integrals of the exponential, logarithmic, inverse trigonometric and hyperbolic functions.

☒ Course content listing

Course Content		Pages and assignments
❖ Chapter 0: Before Calculus 0.1 Functions 0.2 New functions from old 0.3 Families of functions 0.4 Inverse functions		1 - 38 all odd questions
❖ Chapter 1: Limits and Continuity 1.1 Limits (An intuitive approach) 1.2 Computing limits 1.3 Limits at infinity; End behavior of a function 1.5 Continuity 1.6 Continuity of Trigonometric function		49 - 101 all odd questions
❖ Chapter 2: The Derivative 2.1 Tangent lines and rates of change 2.2 The derivative function 2.3 Introduction to techniques of differentiation 2.4 The product and quotient rules 2.5 Derivatives of Trigonometric functions		110 - 161 all odd questions

2.6 The chain rule 2.7 Implicit differentiation	
❖ Chapter 3: The Derivative in graphing and applications 3.1 Analysis of functions I: Decrease and concavity 3.2 Analysis of functions II: Relative extrema, Graphing polynomial 3.3 Analysis of functions III: Rational functions, Cusps and vertical tangents 3.4 Absolute maxima and minima 3.8 Rolle's theorem, Mean value theorem	187 - 216 & 252 all odd questions
❖ Chapter 4: Integration 4.2 The Indefinite integral 4.3 Integration by substitution 4.5 The definite integral 4.6 The fundamental theorem of Calculus 4.9 Evaluating definite integrals by substitution	265 - 309 & 337 all odd questions
❖ Chapter 5: Applications of the definite integral in geometry, science and engineering 5.1 Area between two curves 5.4 Length of a plane curve	347 & 371 all odd questions
❖ Chapter 6: Exponential, Logarithmic and inverse trigonometric functions 6.1 Exponential and Logarithmic functions 6.2 Derivatives and integrals involving Logarithmic functions 6.3 Derivatives of inverse functions, Derivatives and integrals involving exponential functions 6.4 Graphs and applications involving Logarithmic and exponential functions 6.5 L'Hopital's rule, indeterminate forms 6.6 Logarithmic and other functions defined by integrals 6.7 Derivatives and integrals involving inverse Trigonometric functions 6.8 Hyperbolic functions	409 - 472 all odd questions

☒ Evaluation Strategies

<u>Assessment</u>	<u>Expected Due Date</u>	<u>Percentage</u>
First Exam	To be announced later	25 %
Second Exam	To be announced later	25 %
Final exam	Please refer the bulletin	50 %

☒ Office Hours

Sunday	
Monday	
Tuesday	
Wednesday	