The University of Jordan
School of Science
Department of Mathematics
Course outline

Course code and name: 0301101 Calculus I
Credit hours: 3
Prerequisite: None

Course contents and schedule

Topic	Week
1. Functions and models §1.1: Four ways to represent a function Ex: 2, 4, 7–10, 31-55, 69–78 §1.2: Mathematical models: A catalog of essential functions Ex: 1-5, 7-11 §1.3: New functions from old functions Ex:1-3, 5-7, 9-24, 29, 34-37, 41, 45-53, 63 §1.4: Exponential functions Ex: 1, 3, 11–21, 37 §1.5: Inverse functions and logarithms Ex: 3–12,15-18, 21-31, 35–41, 47–57, 63–72, 75	1-4
2. Limits and derivatives §2.2 The limit of a function Ex: 7, 8, 11, 15–17, 31-44 §2.3 Calculating limits using the limit laws Ex: 1, 2, 7, 9,10-32, 37, 39, 41–46, 49, 50, 53, 54 § 2.5: Continuity Ex: 4, 18, 20, 23, 33, 35–39, 41, 42, 45-49, 51-58, 62,71 § 2.6: Limits at infinity; Horizontal asymptotes Ex: 4, 7, 13–42, 48, 50-52, 67 §2.7: Derivatives and rate of change Ex: 31, 33, 35, 37-42, 59, 60 §2.8: The derivative as a function Ex: 1, 3, 25, 27, 29, 41-44	5-7
3. Differentiation rules §3.1: Derivatives of polynomials and exponential functions Ex: 3–38, 47, 48, 55-59, 72, 74, 76, 78, 81, 83 §3.2: The product and quotient rules Ex: 3-27, 32, 33, 43, 48, 49, 54 §3.3: Derivatives of trigonometric functions Ex: 1–16, 21–24, 30, 50–52, 54 §3.4: The chain rule Ex: 7–46, 50, 51, 53, 56, 59, 61- 66, 71, 97, 98	7-9

§3.5: Implicite differentiation Ex: 5–21, 25, 29, 30, 35, 37, 49-60, 75-78 §3.6: Derivatives of logarithmic functions Ex: 2-23, 26, 29, 33, 41-55 §3.10: Linear approximations and differentials Ex: 2, 3, 6–11, 13, 15, 17, 19, 23, 27, 29 §3.11: Hyperbolic Functions Ex: 1–21, 23, 30, 34, 37, 38, 42, 43, 45, 47	
4. Applications of differentiation §4.1: Maximum and minimum values Ex: 7, 11, 13, 29–45, 47–62, 65–68 §4.2: The mean value theorem Ex: 1, 3, 5, 7-9, 11, 13, 14, 18, 19-21, 22, 25-27, 31 §4.3: How derivatives affect the shape of a graph Ex:5–7, 9, 12, 15, 17, 19-21, 26, 35-37, 42-46, 49-56 §4.4: Indefinite forms and L'Hopital's rule Ex: 8, 9, 11, 14, 15, 19, 25, 32, 35, 40, 44, 51-53, 57, 62, 64, 67-70 §4.5: Summary of curve sketching Ex: 4, 5, 10, 13, 15, 18, 20, 30, 43, 46, 51, 52, 64, 65, 66, 69	10-12
5. Integrals §5.2: The definite integral Ex: 33, 35, 37, 38, 40, 41, 47-50 §5.3: The fundamental theorem of calculus Ex: 7, 8, 10, 11, 13, 16, 19-44, 59, 63, 64, 67, 68 §5.4: Indefinite integrals and the net change theorem Ex: 2, 6, 9, 11, 13, 14, 17, 18, 21-46, 49, 50 §5.5: The substitution rule Ex: 3, 7–73, 78, 79, 87, 88	12-13

Text book

Calculus (Early Transcendentals): James Stewart, 8th Edition, Thomson, 2015.