| UNITED INTERNATIONAL UNIVERSITY Department of Computer Science and Engineering (CSE) Course Syllabus 1. Course Title : Calculus and Linear Algebra  2. Course Code : MATH 2183  3. Trimester and Year : Spring 2024  4. Credit Hours: 3  5. Section : G  6. Instructor’s Name Muhaiminul Islam Adnan (MIA), Lecturer in Mathematics, INS.  7. Email [adnan@ins.uiu.ac.bd](mailto:adnan@ins.uiu.ac.bd), Mobile – 01911611301, Room No. 619 |
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| **Course Syllabus of Math 183/2183** |
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| | **Class** | **Topics/Assignments** | **COs** | **Reading Reference** | **Activities** | | --- | --- | --- | --- | --- | | **Calculus** | | | | | | 1, 2 | Analysis of Function I: Slope and Concavity |  | **4.1:** Definition-4.1.1, Theorem-4.1.2, Definition-4.1.3, Theorem-4.1.4, Inflection points, Definition-4.1.5. Examples: 1-5  Exercise Set 4.1: 9,10, 15-20 | Q/A  Test,  Assignment | | 3, 4 | Analysis of function II: Relative Extrema and Polynomials |  | **4.2:** Definition-4.2.1, Theorem-4.2.2, First Derivative Test, Theorem-4.2.3, Second Derivative Test, Theorem-4.2.4, Analysis of polynomials. Examples: 1-8 Exercise Set 4.2: 33-54 | Q/A  Test,  Assignment | | 5, 6 | Partial Derivatives |  | **13.3:** Definition-13.3.1,Examples: 1-5, 10-14 Exercise Set 13.3: 1-13, 25-52, 85-92, 95-104 | Q/A  Test,  Assignment | | 7, 8 | The Chain Rule |  | **13.5:** Theorem-13.5.1, Theorem-13.5.2, Theorem-13.5.3, Related rates problems,Theorem-13.5.4,  Theorem-13.5.5, Other versions of chain rule. Examples:1-8 Exercise Set 13.5: 1-10, 17-34, 41-44, 50-54 | Q/A  Test,  Assignment | | **Ordinary Differential Equations** | | | | | | 9 | Introduction to the differential equations |  | **BD**1.3: Exercise: (1-27)odd | Q/A  Test,  Assignment | | 10-13 | Methods for the solution of the 1st order differential equations |  | **BD** 2.1: Examples: 1-4  Exercise: (1-19)odd  **BD** 2.2: Examples: 1-3  Exercise: (1-19)odd  **BD** 2.6: Example: 1, 2  Exercise: (1-13)odd  **Zill** 2.5: Example: 1, 2  Exercise: 1-10, 15-22 | Q/A  Test,  Assignment | | 14-16 | Methods for the solution of the higher Or, 2nd order homogeneous and non-homogeneous linear differential equations with constant coefficients |  | **BD** 3.1: Example: 1-3  Exercise: 1-16  **BD** 3.3: Example: 1-3  Exercise: 7-22  **BD** 3.4: Example: 1-3  Exercise: 1-14  **HKD 3**  Exercise 3.20: 1-11  Example : 51, 52  Exercise 3.21: 1, 2, 4-6, 8  Exercise 3.22: 1-2, 5, 6, 8-11, 13, 15, 17;  Example : 54-56  Exercise 3.23: 1, 4, 5, 11  Example: 57, 58, 59 & 61. | Q/A  Test,  Assignment | | Linear Algebra   | 17-19 | Introduction to the system of linear equations. |  | **HR** 2.1: Examples: 1-7 Exercise:(1-23) odd  **HR** 2.2: Examples: 1–7  Exercise : (1-37)odd, 43, 45 | Q/A  Test,  Assignment | | --- | --- | --- | --- | --- | | 20-24 | Matrices and Matrix Algebra |  | **HR** 3.1: Examples: 1-8, 10  Exercise: (1-19)odd  **HR** 3.2: Examples: 1-12  Exercise: (1-15)odd  **HR** 3.3: Examples:3  Exercise: 11  **HR** 4.3: Examples: 1-6  Exercise: 1-10  **HR** 4.4: Examples: 1-4  Exercise: 3, 4  **HR** 8.2: Examples: 2, 3 | Q/A  Test,  Assignment | | | | | | |

| **Textbook** | 1. Contemporary Linear Algebra, Howard Anton, Robert C. Busby (**HR**). 2. Elementary Differential Equations, Boyce &Diprima (**BD**) [9thEdition]. 3. Calculus 10-th Edition by Howard Anton, Irl Bivens and Stephen Davis |
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| **Reference** | 1. A First Course in Differential Equations with Modeling Applications, Dennis G. Zill (**Zill**) [10th Edition]. 2. Engineering Mathematics, H. K. Dass (**HKD**) [15th Edition]. |

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**Appendix 1: Assessment Methods**

| **Assessment Types** | **Marks** |
| --- | --- |
| Attendance | 5% |
| Assignments | 5% |
| Class Tests | 20% |
| Mid Term | 30% |
| Final Exam | 40% |

**Appendix 2: Grading Policy**

| **Letter Grade** | **Marks %** | **Grade Point** | **Letter Grade** | **Marks%** | **Grade Point** |
| --- | --- | --- | --- | --- | --- |
| A (Plain) | 90-100 | 4.00 | C+ (Plus) | 70-73 | 2.33 |
| A- (Minus) | 86-89 | 3.67 | C (Plain) | 66-69 | 2.00 |
| B+ (Plus) | 82-85 | 3.33 | C- (Minus) | 62-65 | 1.67 |
| B (Plain) | 78-81 | 3.00 | D+ (Plus) | 58-61 | 1.33 |
| B- (Minus) | 74-77 | 2.67 | D (Plain) | 55-57 | 1.00 |
|  |  |  | F (Fail) | <55 | 0.00 |