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| BRAC UNIVERSITY | | |
| Semester | : | Fall’ 2017 |
| Course Title | : | MATH IV: Linear Algebra and Fourier Analysis |
| Course Code | : | MAT216, Section: 03 |
| Course Credits | : | 03 |
| Prerequisite | : | MATH120 |

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| **INSTRUCTOR DETAILS** | |
| Shamima Nasrin  Lecturer  Department of Mathematics and Natural Sciences,  BRAC University | **Office:**15th Floor, Building2,  Department of Mathematics and Natural Sciences **E-mail: shamima.nasrin@bracu.ac.bd** |

**LECTURE**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CLASS** | | |  | | |
| **DAY** | **TIME** | **ROOM** |  |  |  |
| SUN | 12:30―13:50 | UB10404 |  |  |  |
| TUES |  |  |

**FORM OF ASSESSMENT**

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| --- | --- |
| Attendance | 5 |
| Quiz | 25 |
| Midterm | 20 |
| Final Exam | 50 |
| Total | 100 |

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| **Attendance** | **Marks** |
| 90% and above | 5 |
| 85% ― 89% | 4 |
| 80% ― 84% | 3 |
| 75% ― 79% | 2 |
| 70% ― 74% | 1 |
| Less than 70% | 0 |

**ADMINISTRATIVE INFORMATION**

* Average of the best 3 out of 4 will be taken into account.There will be **no makeup quizzes**.
* There will be **no makeup midterm** as well, unless any student submitsapplication through the corresponding chair of the department at least *7 days before* the midterm’s scheduled date.
* No students will be allowed to sit for final exam if he/she **misses 30%** of the total classes.
* Student may find other supporting course materials at the following link

**\\tsr\Spring\MNS\Shamima Nasrin\MAT216 SEC 03**

* Students are **strongly recommended** to visit instructor’s office to consult. If anyoneis unable to meet with the instructor during consultation hour, then instructor may allow students to consultby appointment.

**TEXT BOOK LIST**

**Linear Algebra**

1. Anton, H., Rorres, C. *Elementary Linear Algebra*, *Applications Version*,11th ed. Wiley, 2014
2. Larson, R., Falvo, D.C.*Elementary Linear Algebra*,Houghton Mifflin Harcourt, 6th ed. 2009.

**Calculus**

1. Anton, H. Bivens, I. Davis, S. *Calculus Early Transcendentals*, 10th ed. John Wiley and Sons Inc., 2012.

**Fourier Analysis**

1. Spiegel, M.R.*Schaum's Outline of Fourier Analysis with Applications to Boundary Value Problems,*McGraw-Hill, 1974.

# LECTURE PLAN

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| --- | --- | --- | --- | --- |
| **Lecture**  **No.** | **Topics** | **QUIZ** | **Text Reference**  **(No.)** | **Chapter Sections** |
| **LINEAR ALGEBRA** | | | | |
| 1 | System of linear equations, Gaussian elimination method | 1 |  |  |
| 2 | Matrices, Matrix operations, Gaussian elimination using matrices. |  |  |
| 3 | Inverse matrix, Method of finding inverse matrix. |  |  |
| 4 | Geometric vector, Vector spaces and subspaces |  |  |
| 5 | Linear independence and dependence, Basis and dimension. |  |  |
| 6 | Rank and nullity. |  |  |
| 7 | **Quiz 1+**Linear transformation | 2 |  |  |
| 8 | Eigen values and eigenvectors. |  |  |
| 9 | Diagonalization |  |  |
| 10 | Review of the previous lectures |  |  |
| **CALCULUS** | | | | |
| 11 | Double integrals |  |  |  |
| 12 | **Quiz 2+**Triple integrals |  |  |  |
| 13 | **MIDTERM EXAMINATION (TENTATIVE)** | | | |
| 14 | Line integral, surface integral | 3 |  |  |
| 15 | Volume integrals |  |  |
| 16 | Problems related to line and surface integrals |  |  |
| 17 | Gradient, Divergence and curl of a point function. |  |  |
| 18 | Green’s theorem, Stoke’s theorem. |  |  |
| 19 | Divergence theorem or Gauss’s theorem. |  |  |
| 20 | **Quiz 3+**Transformation of coordinates, Jacobian. |  |  |  |
| **FOURIER ANALYSIS** | | | | |
| 21 | Fourier Analysis : Real and complex form | 4 |  |  |
| 22 | Fourier integrals, transforms |  |  |
| 23 | **Quiz 4+**Fourier transforms and their application in solving boundary value problems. |  |  |  |
|  |
| 24 | Review of the previous lectures |  |  |  |

**NOTE:** Lecture Plan may be changed, if necessary, according to the progress of the students.