**** The Islamia University of Bahawalpur

Department of Economics

**Course Plan**

**Class:** BS **(Economics) Semester- 1st**

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| Instructor | Dr. Ishtiaq Ahmad | Email: [ishtiaq.ahmad@iub.edu.pk](mailto:ishtiaq.ahmad@iub.edu.pk) | |
| Course Title | Mathematical Economics-I | Program | BS Economics |
| Course Number | ECON-00104 |

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| **Course Objective:**  An introduction to analysis for students who have successfully completed the first semester of calculus. This course presents foundation concepts in analysis which lay the groundwork for further study in Economics and Social Sciences. It is normally required material for Economics majors. Topics studied include partial fraction, sequences, series, derivatives along with its concepts, differential equations and higher order linear differential equations. | | | | | | | | | | |
| |  |  | | --- | --- | | Attendance | 5% | | Workshop / Assignments/Case study | 5% | | Surprise Test/Sudden Test , Quizzes | 5% | | Class Participation | 5% | | Mid Term Paper | 30% | | Final Term paper | 50% | | **Total** | **100%** | | | | | | | | | | | |
|  | **Reference Book** | | | | | | **Research Papers** | | | |
| **i** | | | **M. N. M Talpur. “Calculus and Analytical Geometry”. Ferozson (Pvt.) Limited. Latest Ed.** | | |  | Search Digital Library on IUB site | | |
| **ii** | | | S. M. Yousaf; Abdul Majeed; M. Amin. “Mathematical Methods”. Ilmi Kitab Khana, Lahore. Latest Ed. | | |  |  | | |
| **iii** | | | Barnard, K. and David R. Hill. “Introductory Linear Algebra with Application”. 7th Ed. Prentice Hall, 2001. | | |  |  | | |
| **vi** | | | Thomas, G.B; and Finney, R.L. “Calculus and Analytic Geometry”. 9th Ed. Addison Wesley, 1995. | | |  |  | | |
| **v** | | | Dennis, G. Z. “Differential Equations with Boundary Value Problems”. 9th Ed. Cengage Learning, 2017. | | |  |  | | |
| **Web Resources**  <http://jpkoning.blogspot.com/>, <https://www.moneyandbanking.com/>, [www.sbp.gov.pk](http://www.sbp.gov.pk), [www.worldbank.org](http://www.worldbank.org), [www.imf.org](http://www.imf.org) | | | | | | | | | |
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|  |  | | **LEARNING OBJECTIVE**  After completion of this course participants should be able:   * examine the structure and properties of the real number system * use the definition of convergence of a sequence to determine the limit of a sequence; * define the derivative of a function and establish properties of differentiable functions | | | | | | | |
| **Grading** | Exam (Date to be announced)  Mid- Exam (30%) Final Exam (50%) Problem Session/Assignments (20%) | | | | | | | | | |
| **Problem Session** | Preferably in class | | | | | | | | | |
| **SEQUENCE OF TOPICS TO BE COVERED** | | | | | | | | | | |
| Lecture Date | | Session # | | | | Topics (outline of main topics and sub topics) | | |  | Tutorial /Laboratory | |
| **WEEK 1** | | **24th of Feb to 28th of Feb** | | | | *Partial Functions & Sequences and Series:* Concepts of partial fraction, sequences and type of sequences | | |  | **Tutorial** | |
| **WEEK 2** | | **2nd of March to 6th of March** | | | | Arithmetic progression, arithmetic mean, Geometric progression | | |  | **Tutorial** | |
| **WEEK 3** | | **9th of March to 13th of March** | | | | Geometric mean, Harmonic mean progression and harmonic mean | | |  | **Tutorial** | |
| **WEEK 4** | | **16th of March to 20th of March** | | | | Arithmetic sense, geometric series, harmonic series and sign notation | | |  | **Tutorial** | |
| **WEEK 5** | | **23rd of March to 27th of March** | | | | *Derivatives and Concept of Derivatives*: Rules of derivatives, geometric interpretation, derivatives of combination of functions | | |  | **Tutorial** | |
| **WEEK 6** | | **30th of March to 3rd of April** | | | | Derivatives of inverse functions, concept of partial derivations, rules of partial derivatives | | |  | **Tutorial** | |
| **WEEK 7** | | **6th of April to 10th of April** | | | | Derivatives of log functions, derivatives of trigonometric functions | | |  | **Tutorial** | |
| **WEEK 8** | | **13th of April to 17th of April** | | | | Anti-derivatives, concepts, techniques of integration Leibnitz-theorem | | |  | **Tutorial** | |
| **WEEK 9** | | **20th of April to 26th of April** | | | | **Mid Term Examination** | | |  | **Tutorial** | |
| **WEEK 10** | | **27th of April to 1st of May** | | | | Differential equations of first order preliminary theory, separable variable | | |  | **Tutorial** | |
| **WEEK 11** | | **4th of May to 8th of May** | | | | Homogenous equations, linear equations, exact equations | | |  | **Tutorial** | |
| **WEEK 12** | | **11th of May to 15th of May** | | | | Equations of Bernoulli, equations of Ricatti and equations of Clairaut’s | | |  | **Tutorial** | |
| **WEEK 13** | | **18th of May to 22th of May** | | | | Homogenous linear equations, non-homogenous linear equations | | |  | **Tutorial** | |
| **WEEK 14** | | **25th of May to 29th of May** | | | | The method of undermined coefficients, the Cauchy Euler equation | | |  | **Tutorial** | |
| **WEEK 15** | | **1st of June to 5th of June** | | | | Reduction of order, the method of variation of parameters, exact linear equations | | |  | **Tutorial** | |
| **WEEK 16** | | **8th of June to 12th of June** | | | | Exercises | | |  | **Guidance** | |
| **WEEK 17** | | **15th of June to 19th of June** | | | | Exercises | | |  | **Guidance** | |
| **-** | | **22nd of June to 28th of June** | | | | **Final Term Examination** | | |  |  | |