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| Course Title | Numerical Applications and Methods for Business |
| Course Code | BUS210 |
| Course Type | Compulsory |
| Level | Bachelor |
| Year / Semester | 2nd year/3rd Semester |
| Instructor's Name | TBA |

| ECTS | 6 | Lectures / week | 3 Hours /14 Weeks | Laboratories / week | None |
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| Course Purpose and Objectives | To develop the core mathematical skills a business student would need to deal with basic calculations and applied business problems. Students will be provided with key mathematical analysis and tools for modeling of a wide range of applications used in business, finance and economics. This course is designed with an aim to apply calculus techniques and analysis to mathematical problems associated with quantitative study in areas relevant to business, finance and economics. |
| Learning Outcomes | Upon successful completion of this course students should be able to: <br><br> • construct and present mathematical arguments with accuracy and clarity; <br> • manipulate quantitative calculations logically and with high levels of accuracy apply <br> • and manipulate common functions used in calculus; <br> • calculate, manipulate and use differential and integral calculus of a single variable; <br> • use analytic techniques to solve ordinary differential equations of first-order; <br> • extend calculus techniques to the differential calculus to several variables; <br> • apply calculus techniques to multi-dimensional optimization problems; |

| Prerequisites | None | Co-requisites | None |
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| Course Content | Limits and Continuity <br> Limits, Continuity, Continuity applied to inequalities <br><br> Differentiation |

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| | Definition of the derivative, Rules for differentiation, Derivative as a rate of change, Product and quotient rules, Chain rule |
| | Applications of the derivative<br>Derivatives of exponentials and logarithms, Higher order derivatives, Implicit differentiation, Logarithmic differentiation, Marginal analysis, Elasticity of demand |
| | Curve Sketching<br>Relative and absolute extrema, First derivative test, Concavity, Second derivative test, Asymptotes (vertical, horizontal and oblique), Optimization |
| | Integration<br>Differentials, Anti-derivatives and the indefinite integral, Basic integration rules<br>Integration by substitution, Fundamental Theorem of Calculus, Area, Definite integrals, Area between two curves |
| | Applications of Integration<br>Integration by parts, Partial fractions, Approximate integration and error analysis<br>Consumer's and Producer's Surplus, Average value, Present value, Annuities |
| Teaching Methodology | Face-to-face |
| Bibliography | Michael Sullivan:<br>FINITE MATHEMATICS: AN  APPLIED  APPROACH,<br>Latest Edition, Wiley.<br><br>Frank Budnick, S.:<br>APPLIED MATHEMATICS FOR BUSINESS, ECONOMICS AND THE SOCIAL SCIENCES (Latest Edition ) McGraw-Hill<br><br>R. A. Barnett, M. R. Ziegler & K. Byleen:<br>CALCULUS FOR  BUSINESS, ECONOMICS,LIFE AND SOCIAL SCIENCES (Latest Edition) Prentice-Hall, Inc. |

| Assessment | | |
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| | Examinations | 80% |
| | Assignments | 10% |
| | Class Participation and Attendance | 10% |

|  |  | 100% |  |
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| Language | English |  |  |