

Lesson Plan Template

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| Semester/Year: | Fall 2019 | Department: | Computer Science and Engineering |
| Course Code: | MAT 101 | Course Title: | Differential and Integral Calculus |

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| S/L | Topic | Learning Outcomes | No. of Session | Activities | Assessment | Learning Resources |
| 1 | Differential Calculus: Functional Analysis and Graphical Information: function, properties of functions, graphs of functions, new function from old, lines and family of functions, Limit: Limits (an informal view), one sided limits, the relation between one sided and two sided limits, computing limits, Continuity: continuity and discontinuity, some properties of continuity, the intermediated value theorem. | ILO 1-3 | 6 | Lecture, Discussion, Problem Solving | **AS 1, AS2, AS7** | Books, Websites, Lecture notes |
| 2 | Derivatives: slop and rate of change, tangent and normal, derivative of a function, physical meaning of derivative of a function, techniques of differentiation, chain rule, successive derivatives. | ILO 3 | 3 | Lecture, Discussion, Problem Solving | **AS 1, AS2, AS7** | Books, Websites, Lecture notes |
| 3 | Derivative in graphing and applications: analysis of functions, maximum and minimum, Expansion of functions: Taylor's series, Maclaurian's series, Leibniz; Rolle's and Mean Value theorems, Partials and total derivatives of a function of two or three variables. | ILO 1-3 | 3 | Lecture, Discussion, Problem Solving | **AS 1, AS2, AS7** | Books, Websites, Lecture notes |
| 4 | Different technique of integration: integration, fundamental integrals, methods of substitutions, integration of rational functions, integration by parts, integrals of special trigonometric functions, reduction formulae for trigonometric functions. | ILO 3 | 6 | Lecture, Discussion, Problem Solving, Presentation | **AS 1, AS2, AS7** | Books, Websites, Lecture notes |
| 5 | Definite integrals: general properties of definite integral, definite integral as the limit of sum and as an area, definition of Riemann integral, Fundamental theorem of integral calculus and its applications to definite integrals, determination of arc length, Improper integrals, Double integrals, Evaluation of Areas and Volumes.Introduction to MATLAB and LAB Sessions. | ILO 3 | 6 | Lecture, Discussion, Problem Solving, Presentation | **AS 1, AS2, AS7** | Books, Websites, Hand Notes |

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