**Adv. M. N. Deshmukh Art’s Commerce and Science College , Rajur**

 **Annual planning for the year 2016-2017**

 S . Y . Bsc . Mathematics Paper I

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| Sr. No. | Month | Total Lectures | Name of the topic |
|  | Sem- I |  |  Paper I - Multivariable Calculus |
| 1 | June 2016 | 6 | Ch – 1 Limits and Continuity of Multivariable functions * 1. Functions of several variables , graphs and level curves of function of two variables.
	2. Limits and Continuity in higher dimensions.
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| 2 | July 2016 | 12 | Ch – 2 Partial Derivatives2.1 Definition and examples.2.2 Second order partial derivative , the mixed derivative theorem.2.3 Partial derivative of higher order.Ch – 3 Differentiability 3.1 Differentiability , the increment theorem for functions of two variables (without proof).3.2 Chain rule for composite function. |
| 3 | Aug 2016 | 14 | 3.3 Directional derivative , gradient vectors.3.4 Tangent planes , normal lines and differentials.Ch – 4 Extreme Values4.1 Extreme values , First derivative test and Second derivative test for local extreme values.4.2 Lagrange’s multipliers method for finding extreme values of constraint function (One constraint)4.3 Taylor’s Formula for two variables. |
| 4 | Sep 2016 | 12 | Ch -5 Multiple integrals5.1 Double integral over rectangles , Fubini’s Theorem for calculating double integrals (without proof).5.2 Double integral in polar form.5.3 Triple integrals in rectangular coordinates. |
| 5 | Oct 2016 | 4 | 5.4 Triple integrals in cylindrical and spherical coordinates5.5 Substitution in multiple integrals, Application to area and volumes. |
|  | Sem II |  | Paper I – Linear Algebra |
| 1 | Dec 2016 | 8 | Ch -1 Vector SpacesVector , examples, linear dependence , basis and dimension , vector subspace |
| 2 | Jan 2017 | 12 | Necessary and sufficient condition for subspace , vector space as a direct sum of subspaces.Ch -2 Inner Product SpacesInner product , norm as length of a vector , distance between two vectors. |
| 3 | Feb 2017 | 12 | Orthonormal basis , orthonormal projection , Gram Schmidt processes of ortogonalization , null space , range space , rank , nullity, Sylvester Inequality. |
| 4 | Mar 2017 | 10 | Ch -3 Linear TransformationsDefinition , examples properties of linear transformations , kernel and rank of linear transformation , composite transformation , Inverse of a linear transformation. |
| 5 | April 2018 | 6 | Matrix of a linear transformation , change of basis , similar matrices. |