

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: II, 5Year Integrated MSc

Subject- Mathematics II (Analysis-I)

Session: Even semester 2017

Branch: Physics, Chemistry, Mathematics

Name of Faculty: Dr. N. K. Sahu

| Period | Module/ Number | Topic to be covered | Remarks |
|--------|-------------------|--|---------|
| 1 | I | Number systems, Algebra of real numbers | |
| 2 | I | Completeness , Density property , Continuum property | |
| 3 | I | Decimal representation of real numbers | |
| 4 | I | One to one correspondence , Bijective functions | |
| 5 | I | Cardinality, Countability | |
| 6 | I | Countability of rationals , Uncountability of R | |
| 7 | I | Sequences , Convergence of sequences | |
| 8 | I | Limits of sequences , Limit theorems | |
| 9 | I | Wierstrass completeness principle, Cantor's completeness principle | |
| 10 | II | Series, Infinity series , Series with positive terms | |
| 11 | II | Convergence of series , Necessary conditions | |
| 12 | II | Convergence of series(continue) | |
| 13 | II | Bounded sets, Supremum, Infimum, Limsup, Liminf | |
| 14 | II | Interior points, Open sets, Limit points, Closed sets | |
| 15 | II | Bolzano Wierstrass Theorem for sets | |
| 16 | II | Bolzano Wierstrass Theorem for sequences | |
| 17 | II | Functions, Limit of a function | |
| 18 | II | Continuity, Discontinuity of functions | |
| 19 | II | Properties of continuous functions | |
| 20 | III | Differentiability | |
| 21 | III | Increasing and decreasing functions and their characterizations | |
| 22 | III | Sign of the derivatives, Local maximum, Local minimum | |
| 23 | III | Properties of differentiable functions | |
| 24 | III | Mean value conditions, Rolle's theorem | |
| 25 | III | Mean value theorem-I (Cauchy) | |
| 26 | III | Mean value theorem-II (Langrange) | |
| 27 | III | Taylor's theorem, Series construction | |
| 28 | III | Applications of Taylor's theorem | |
| 29 | IV | Riemann integration, Upper sum, Lower sum | |
| 30 | III | Examples of Riemann integrals | |
| 31 | IV | Inequalities, Properties of integrals | |
| 32 | IV | Conditions of integrability | |
| 33 | IV | Fundamental theorems of Calculus | |
| 34 | IV | Improper integrals, Infinite discontinuity, Convergence at the end points (end points as discontinuity points) | |

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| 35 | IV | Convergence of improper integrals at interior points (Interior points as discontinuity points) | |
| 36 | IV | Comparison Tests | |
| 37 | IV | General test for convergence | |
| 38 | IV | Absolute convergence of integrals | |
| 39 | IV | Improper integrals with infinite range of integration | |
| 40 | IV | Convergence tests | |