Semester – III
CORE – III
Paper - V(6hrs /week)
SEQUENCES AND SERIES – I (90 hours) (AMMA31)

Objectives:

- To acquire basic ideas of classical analysis.
- To study the be haviour of sequences and series.

Course Learning Outcomes: It enables the students to

1.accommodate the concept of different types of sequences and series.

2. know how to apply various tests to test the convergence of series.

UNIT – 1:

Real number system: The field of axioms, the order axioms, the rational numbers, the irrational numbers, upper bounds, maximum element, least upper bound (supremum). The completeness axiom, absolute values, the triangle inequality Cauehy – Schwartz's inequality. (Text Book 1:)

UNIT – 2:

Sequences: Bounded sequences – monotonic sequences – Convergent sequences – divergent and oscillating sequences – The algebra of limits. (Text Book 2)

UNIT – 3:

Behaviour of monotonic sequences – Cauchy's first limit theorem – Cauchy's second limit theorem – Cesaro's theorem – subsequences – Cauchy sequence – Cauchy's general principle of convergence. (Text Book 2)

UNIT – 4:

Series: Infinite series – n^{th} term test – Comparison test – Kummer's test – D Alembert's ratio test – Raabe's test – Gauss test – Root test. (Text Book 2)

UNIT – 5:

Alternating series – Leibnitz's test – Tests for Convergence for series of arbitrary terms – Multiplication of series – Abel's theorem – Merten's theorem – Power series – Radius of Convergence. (Text Book 2)

Text Books:

- Tom.M Apostol – Mathematical Analysis, Narosa Publishing house, New Delhi. II Edition.. for unit – 1.
- S. Arumugam and Thangap and iIssac- " Sequences and series " – Scitech Publications, Chennai. for unit - 2,3,4 & 5.

Book for Reference:

- Elements of Real analysis Shanti Narayan & Dr.M.D.Raishinghania S.Chand & Co.,Revied Edition.
- Ellina Grigorieva - Methods of Solving Sequence and series Problem-Springer Link.
- Richard R. -" Methods of real analysis" Goldberg (Oxford and IBH Publications Co.) 1

Semester - III
SKILL BASED CORE – PAPER I (4hrs/week)
VECTOR CALCULUS (60 hours) (ASMA3A)

Objectives:

- ❖ To lay a good foundation of vector differentiation and vector integration.
- ❖ To solve problems related to this.

Course Learning Outcomes: It enables the students to

1.recognize the importance of integration.

2.relate the line integral, surface integral and volume integral.

UNIT – 1:

Vector point functions – Scalar point functions – Derivative of a vector and derivative of sum of vectors – Derivative of product of a scalar and vector point function – The vector operator ∇ - Gradient.

UNIT – 2:

Divergence – Curl, solenoidal, irrotational vectors –Laplacian operator.

UNIT – 3:

Integration of point function – Line integral – Surface integral.

UNIT – 4:

Volume Integral – Gauss divergence theorem (Statement without Proof) – Problems.

UNIT – 5:

Green's theorem and Stoke's theorem (Statement without Proof) – Problems.

Text Book:

Duraipandian and Laxmi Duraipandian, Vector Analysis- Emerald Publishers(Revised Edition, Reprint 2005).

Books for References:

- Dr. S. Arumugam and others –Vector Calculus, New Gamma Publishing House.(2006).
- Susan. J. C – Vector Calculus (4^{th} Edition), Pearson Education, Boston (2012).
- Murray Spiegel - Vector analysis – Schaum Publishing company, New York (2009).