

Offering Department: Department of Mathematics
Part – III - SEC - III Value Added Course
(For students admitted from 2019-20 and onwards)

Offered in any semester –from II to V			
19AEVA11	VAC-I Vedic Mathematics	Total Duration 40Hrs	1 Credit

Objectives:-

Upon completion of the course students will be able to

1. Understand and appreciate the history of ancient mathematics methods
2. Understand the sixteen sutras of vedic mathematics
3. Utilize the sutras in order to solve related problems of short calculation.
4. Solve some of the algebraic problems using the vedic sutras.

Unit – 1: Sutras 1 to 3 (8Hrs)

- Ekadhikina Purvena -By one more than the previous one (Cor: Anurupyena)
- Nikhila Navatashcaramam Dashatah -All from 9 and the last from 10 (Cor: SisyateSesamjnah)
- Urdhva-Tiryagbyham-Vertically and crosswise (Cor: Adyamadyenantyamantyena)

Unit – 2: Sutras 4 to 6 (8Hrs)

- ParaavartyaYojayet-Transpose and adjust (Cor: Kevalaih SaptakamGunyat)
- Shunyam Saamyasamuccaye-When the sum is the same, that sum is zero. (Cor: Vestanam)
- (Anurupy) Shunyamanyat-If one is in ratio, the other is zero (Cor: YavadunamTavadunam)

Unit – 3: Sutras 7 to 9 (8Hrs)

- Sankalana-vyavakalanabhyam-By addition and by subtraction (Cor: YavadunamTavadunikrityaVargaYojayet)
- Puranapurabyham-By the completion or non-completion (Cor: Antyayordashake)

Unit – 3: Sutras 10 to12 (8Hrs)

- Chalana-Kalanabyham-Differences and Similarities (Cor: Antyayoreva)
- Yaavadunam-Whatever the extent of its deficiency (Cor: Samuccayagunitah)
- Vyashtisamanstih-Part and Whole (Cor: Lopanasthanabhyam)

Unit – 5: Sutras 13 to16 (8Hrs)

- Shesanyankena Charamena-The remainders by the last digit (Cor: Vilokanam)
- Sopaantyadvayamantyam-The ultimate and twice the penultimate (Cor: Gunitasamuccayah Samuccayagunitah)
- Ekanyunena Purvena-By one less than the previous one (Cor: Dhvajanka)
- Gunitasamuchyah-The product of the sum is equal to the sum of the product (Cor: Dwandwa Yoga)
- Gunakasmuchyah-The factors of the sum is equal to the sum of the factors.

TEXT BOOKS: -

1. Swami Bharati Krishna Tirtha, V. S. Agrawala,(2013), *Vedic Mathematics*, Motilal Banarsidass Publishers Pvt Ltd.
2. Dhaval Bathia, (2005), *Vedic Mathematics Made Easy*,Jaico Publishing House.

REFERENCE BOOKS:-

1. Vandana Singhal, (2014), *Vedic Mathematics for all ages: A beginner's Guide*, Motilal Banarsidass Publishers Pvt Ltd.

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19AEVA12	VAC-II Graphing-and-Plotting- Techniques	Total Duration 40Hrs	1 Credit

Objectives:-

Upon completion of the course students will be able to

1. Identify the relevant population, sample, study units (subjects) and variables.
2. Identify data that follow a normal curve and find chances and percentages using a normal curve.
3. Produce and interpret numerical summary statistics using mean, median, mode, range, standard deviation and variance.
4. Perform and interpret testing of hypothesis including chi-squared test and other ANOVA test for independence.

Unit-1 Types of data and functions (8Hrs)

- Basic plotting and charting concepts
- Plotting of Functions including \log , e^x , 2^x , a^x , \sin , \cos , \tan and hyperbolic functions
- Plotting experimental data

Unit-2 Plotting Data with Microsoft Excel (7Hrs)

- Defining a Data Series
- Pie Chart
- Column Chart
- Line Chart
- Bar Chart
- Area Chart
- Scatter Chart
- Other Chart Types

Unit- 3 Plotting using SCILAB. (8Hrs)

- Scilab basics
- Matrices and vectors using Scilab
- Linespace command, colon operator
- Plot command and its parameters
- Polarplot command and its parameters.
- Formatting plots.

Unit-4 Plotting using GeoGebra (7Hrs)

- Basics of GeoGebra

- Plotting curves like circle, conics, lines, polygons etc using tool bar.
- Plotting using menu-bar of GeoGebra
- Formatting the figures in GeoGebra

Unit-5 Interpretation of data and its plots. (6Hrs)

- Observing the given data and plotting using any of the above methods
- Points to be observed as Interpretation of data from the given plot.
- Problems based on Interpretation.
- Identification of Relationship between variable like linear, quadratic, exponential, logarithmic and other.

TEXT BOOKS: -

1. Judith Hohenwarter and Markus Hohenwarter, (2011), *Introduction to GeoGebra*, International GeoGebra Institute.

REFERENCE BOOKS:-

1. Judith Hohenwarter and Markus Hohenwarter, (2012), *The official manual of GeoGebra*, International GeoGebra Institute.