VI Semester Skill Enhancement Courses

Mathematics Stream:

Sci Lab / Renewable Energy & Energy Harvesting

Bio-Sciences Stream:

Bio-fertilizers / Nursery and Gardening

Arts Stream:

Women & Child Rights / Good Governance

Commerce Stream:

Regulation of Insurance Business / Central Banking
Unit – I

Introduction to Scilab – what is scilab, downloading & installing scilab, a quick taste of scilab.

The Scilab Environment – manipulating the command line, working directory, comments, variables in memory, recording sessions, the scilab menu bar, demos.

Scalars & Vectors – introduction, initializing vectors in scilab, mathematical operations on vectors, relational operations on vectors, logical operations on vectors, built-in logical functions.

Unit – II

Scalars & Vectors – elementary mathematical functions, mathematical functions on scalars, complex numbers, trigonometric functions, inverse trigonometric functions, hyperbolic functions.

Matrices – introduction, arithmetic operators for matrices, basic matrix processing.

Polynomials – introduction, creating polynomials, basic polynomial commands, finding roots of polynomial, polynomial arithmetic, miscellaneous polynomial handling.

Text

Er. Hema Ramachandran, Dr. Achuthsankar S. Nair, *Computer SCILAB–A Free Software to MATLAB*

References

Digite, *Introduction to Scilab*

Digite, *Optimization in Scilab*

Scilab Enterprises, *Scilab for Very Beginners*

Digite, *Introduction to Discrete Probabilities with Scilab*

Note: Student friendly video lecturers pertaining to this course are available at [http://spoken-tutorial.org/](http://spoken-tutorial.org/)

Teachers are advised to teach this course in the computer lab itself, so that the interested students may derive some time to perform few programs their own.
Renewable Energy & Energy Harvesting

Unit-I
Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV modules and equivalent circuits, and sun tracking systems.

Unit-II


Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of Hydro power sources.

Reference Books:
1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
   Press, in association with The Open University.
Bio-fertilizers

2 Credits

Unit-I

1. General account about the microbes used as biofertilizers, Rhizobium, Azotabacter importance in cultivation.
2. Cyanobacteria as biofertilizer, Nitrogen fixation BGA and Azolla in rice cultivation

Unit-II

1. Mycorrhizal association and types of mycorrhizal association; Isolation and inoculums production of VAM and its influence on crop plants.
2. Organic farming - Green manuring and organic fertilizers, recycling of biodegradable municipal, agricultural and industrial wastes.

Suggested Readings:

Nursery and Gardening

2 Credits

Unit-I

1. Nursery: Definition, objectives, scope and building up of infrastructure for nursery.
2. Seed: structure and types- seed dormancy; causes and methods of breaking dormancy- seed storage, seed banks.

Unit-II

1. Gardening definition, objectives and scope- different types of gardening
2. Computer application in landscaping - Gardening operations

Suggested Readings:

Women & Child Rights

Unit - I

1. Introduction: Definition, perspectives and foundations of Human Rights.
7. Women’s Right to Property.

Unit – II

5. National Commission for Protection of Child Rights (NCPCR)

References:

Good Governance

2 Credits

Unit - I: Introduction

1. Meaning Definitions and importance of Governance
2. Concepts of Good Governance
3. Government and Governance
4. Public and Private Governance

Unit- II: State and Governance

1. The State, Market and Civil Society
2. Techniques of Good Governance
3. Good Governance and Civil Society
4. IT Act 2000, ICT and Good Governance