# Proposed Syllabus for Academic Year 2017-18

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>USBO303</td>
<td>CURRENT TRENDS IN PLANT SCIENCES I</td>
<td>2 Credits (45 lectures)</td>
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## Unit 1: Pharmacognosy and Phytochemistry
- Introduction to Pharmacopoeia
- Indian Pharmacopoeia, Indian Herbal Pharmacopoeia, and Ayurvedic Pharmacopoeia
- Study of Monograph from Pharmacopoeia
- Secondary Metabolites: Sources, properties, uses, and adulterants, regional and seasonal variations
- Adulterants: *Saraca asoca, Polyalthia longifolia, Terminalia arjuna, Terminalia tomentosa, Bacopa monnieri, Centella asiatica, Abrus, Glycyrrhiza, Phyllanthus amarus (Bhuiamla)*

## Unit 2: Forestry and Economic Botany
- Forestry: Outline of Types of Forest in India
- Forestry: Agro-forestry, Urban forestry, organic farming, silviculture
- Economic Botany:
- Types of fibers: Jute and cotton
- Current trends in fiber industries
- Spices and condiments: Saffron and cardamom
- Commercial market of spices

## Unit 3: Industry Based on Plant Products
- Aromatherapy: Introduction, Uses with few examples. Jojoba, lemon, jasmin
- Enzyme industry: Cellulases, Papain, Bromelain
- Biofuels.
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<th>Practical Activity</th>
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| 1 | Study of *Phyllanthus amarus*  
Saraca asoka  
Bacopa monieri |
| 2 | Study of biodiversity  
(Visit to National Park/ Botanical Garden)  
Sources of: Fibres & Paper  
Spices & condiments  
Preparation of herbal cosmetics (Face pack/ De-tanning cream) |
<p>| 3 | Estimation of crude fibre in cereals &amp; their products |
| 4 | Preparation &amp; evaluation of probiotic foods |
| 5 | Evaluation of nutraceutical value of mushroom/ wheat germ |</p>
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**Unit I : Horticulture and Gardening**

**Introduction to Horticulture:** Branches of Horticulture  **Gardening:**
- Locations in the garden- edges, hedges, lawn, flower beds, avenue, water garden (with names of two plants for each category).
  - Focal point.
- **Types of garden**
  - Formal and informal gardens

**Unit II : Biotechnology**

- **Introduction to plant tissue culture**
  - Laboratory organization and techniques in plant tissue culture
  - Totipotency
  - Organogenesis
  - Organ culture – root cultures, meristem cultures, anther and pollen culture, embryo culture.
- **R-DNA technology**
  - Gene cloning
  - Enzymes involved in Gene cloning
  - Vectors used for Gene cloning.

**Unit III : Biostatistics and Bioinformatics**

- **Biostatistics:**
  - The chi square test.
  - Correlation – Calculation of coefficient of correlation.
- **Bioinformatics**
  - Information technology: History and tools of IT, Internet and its uses.
- Introduction to Bioinformatics: goal, need, scope and limitation
- Aims of Bioinformatics: Data organization, Tools of Bioinformatics: tools for web search, Data retrieval tools: Entrez,
  - BLAST
  - Bioinformatics programme in India.

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<tr>
<th>Semester III USBOP3</th>
<th>Cr 1</th>
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<td>PRACTICAL - Paper III CURRENT TRENDS IN PLANT SCIENCES I</td>
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**Horticulture**
1. Study of five examples of plants for each of the garden locations as prescribed for theory
2. Preparation of garden plans – formal and informal gardens

**Biotechnology**
4. Various sterilization techniques
5. Preparation of Stock solutions, Preparation of MS medium.
6. Seed sterilization, callus induction
7. Regeneration of plantlet from callus.
8. Identification of the cloning vectors – pBR322, pUC 18, Ti plasmid.

**Biostatistics and Bioinformatics**
9. Chi square test
10. Calculation of coefficient of correlation
12. BLAST