



Hindi Vidya Prachar Samiti's

Ramniranjan Jhunjhunwala College

of Arts, Science & Commerce

(Empowered Autonomous College)

Affiliated to UNIVERSITY OF MUMBAI

Syllabus for the T. Y. B.Sc. (under NEP)

Program: B.Sc. BOTANY

Program Code: RJSUBOT

Discipline specific Elective (DSE) I

Theory Title : Economic Botany

Course Code: RJDSEBOT361

&

Practical Title: Economic Botany

Course Code: RJDSEBOTP361

Semester VI

(Revised in alignment with the NEP2020 facilitating the inter-and multidisciplinary learning and multiple entry and exit of the students)

Level 5.5

(CBCS 2025-2026)

Preamble

The National Education Policy 2020 aims at imparting skill-based learning and caters to the multiple entry and exit facility for the students thus empowering them to acquire knowledge at their pace. In the three-year UG program, the student has two exit options. Students also have the option of choosing the Honors program of four years study in a given discipline and later converting it to five-year integrated PG degree program. As an undergraduate student, he/she learns the core subject (Major), subject complementing the core subject (Minor), a course from other discipline (OEC or GEC) Vocational and Skill Enhancement course from the Major (VSEC). The remaining verticals under NEP 2020 are IKS (Indian Knowledge System), AEC (Ability Enhancement Course), VEC (Value Education Course) and with progressive three years of UG, student also completes at different levels OJT (On Job Training), FP (Field Projects), CEP (Community Engagement Program) , RP (Research Project) which helps him/her in understanding their roots, application of the knowledge for the benefit of self and the society. Vertical CC (Co-curricular activities and activities related to yoga and human well-being) helps in preparing youth with good character and interpersonal relationships.

**Credit Structure for B Sc Semester VI as per NEP 2020 Implemented
from the academic year 2025-2026
Major Subject: Botany**

Semester VI
Level 5.5 Major Botany

Courses	Credits	Total Credits	Course Titles
Major Theory I Plant Physiology and Biochemistry	4	12	RJDSCBOT361
Major Theory II Genetics and Biostatistics	4		RJDSCBOT362
Major Practical I	2		RJDSCBOTP361
Major Practical II	2		RJDSCBOTP362
Discipline specific Elective (DSE) I Theory Economic Botany	2	4	RJDSEBOT361
Discipline specific Elective (DSE) I Practical Economic Botany	2		RJDSEBOTP361
Discipline Specific Elective Course (DSE) II Microbiology and Plant Pathology	2	4	RJDSEBOT362
Discipline Specific Elective Course (DSE) II Microbiology and Plant Pathology	2		RJDSEBOTP362
Vocational Skill Course (VSC) Plant Anatomy	2	2	RJVSCBOTP361
On Job Training (OJT)	4	4	RJOJTBOT361
Total Credits	22	22	

*As per University Grid

T.Y.B..Sc. Semester VI Botany Syllabus

Course Code	Unit	Topic Headings	Credits	Duration
RJDSCBOT361	Paper Title: Plant Physiology and Biochemistry			(60 hours)
	I	Enzymes	4	
	II	Nitrogen metabolism		
	III	Vegetative growth		
	IV	Photomorphogenesis		

Course Code	Unit	Topic Headings	Credits	Duration
RJDSCBOT362	Paper Title: Genetics and Biostatistics			(60 Hours)
	I	Genetic mapping in Eukaryotes	4	
	II	Gene mutations		
	III	Extra chromosomal Inheritance		
	IV	Biostatistics		

Course Code	Unit	Topic Headings	Credits	Duration
RJDSCBOTP361	Practical Title: Plant Physiology and Biochemistry			(60 hours)
			2	

Course Code	Unit	Topic Headings	Credits	Duration
RJDSCBOTP362	Practical Title: Genetics and Biostatistics			(60 hours)
			2	

Elective Course 1

Course Code	Unit	Topic Headings	Credits	Duration
RJDSEBOT361	Paper Title: Economic Botany			(30 hours)
	I	Fibers and Fiber yielding plants	2	
	II	Minor Cereals and Small grains		
	III	Essential Oil		
	IV	Spices and other flavoring materials		

Course Code	Unit	Topic Headings	Credits	Duration
RJDSEBOTP361	Practical Title: Economic Botany			(60 hours)
	I		2	

Elective Course 2

Course Code	Unit	Topic Headings	Credits	Duration
RJOJTBOT362	Paper Title: Microbiology and Plant Pathology			(30 hours)
	I	Types of microbes, Culturing of microbes	2	
	II	Role of microbes in fermentation		
	III	Plant pathology terms, plant diseases caused by fungi, bacteria and virus (one example each)		
	IV	Prevention and control measures for plant diseases		

Course Code	Unit	Topic Headings	Credits	Duration
RJDSEBOTP362	Practical Title: Microbiology and Plant Pathology			(60 hours)
	I		2	

Course Code	Unit	Topic Headings	Credits	Duration
RJVSCBOTP361	Practical Title: Plant Anatomy			(60 hours)
	I		2	

Course Code	Unit	Topic Headings	Credits	Duration
RJOJTBOT361	Paper Title: On Job Training (OJT)			(120 hours)
	I		4	

COURSE OUTCOMES (COs) B. Sc. BOTANY

SEMESTER	:	VI MAJOR SUBJECT DSE I
TITLE OF THE SUBJECT/COURSE	:	ECONOMIC BOTANY
COURSE CODE	:	RJDSEBOT361
CREDITS	:	2
DURATION	:	30 HOURS

LEARNING OBJECTIVES	
1	Develop a basic knowledge of Taxonomic diversity of useful plants
2	Increase awareness and appreciation of plant and plant products encountered in everyday life

COURSE OUTCOME NUMBER	On completing the course, the student will be able to:	PSO Addressed	BLOOMS LEVEL
CO1	Understand the sources of various products obtained from plants and the techniques of value addition	1	BT Level III, IV Apply draw conclusions
CO2	Understand the nutritional value of lesser-known crops and their utilization as an important dietary constituent	1, 5	BT level III, IV and V Apply, analyze and evaluate
CO3	Appreciate the diversity of plants and the plant products in human life.	1,5	BT level III, IV and V Apply, analyze and evaluate

B Sc. BOTANY SEMESTER V Botany Syllabus

Course Code	Title	Credits
RJDSEBOT361	ECONOMIC BOTANY	2 30 hours
Unit I: Fibers and Fiber Yielding Plants ➤ Economic classification of fibers ➤ Textile fiber: Cotton ➤ Soft or Bast fibers ➤ Coir		
Unit II: Minor Cereals and Small grains ➤ Barley, Rye, Oats ➤ Small Grains: Sorghum, Millets ➤ Pseudo cereals: buckwheat Quinoa		
Unit III: Essential Oils ➤ Extraction of essential oil: distillation, Expression, Solvent extraction ➤ Perfume oils: Otto of Roses, Geranium ➤ Grass oils: <i>Citronella</i>		
Unit IV: Spices and other flavoring agents ➤ Spices obtained from roots and root stalks, leaves, barks, flowers or flower buds, fruits, Savory seeds (One example each)		

Suggested References

1. Albert F Hill Economic Botany A textbook of useful Plants and plant products. TATA McGraw Hill Publishing Company Ltd. New Delhi.
2. Wealth of India CSIR Publications
3. Kochar S L (2016). Economic Botany: A comprehensive Study, 5th edition Cambridge.

COURSE OUTCOMES (COs) B. Sc. BOTANY

SEMESTER	:	VI MAJOR SUBJECT DSE I PRACTICAL
TITLE OF THE SUBJECT/COURSE	:	ECONOMIC BOTANY
COURSE CODE	:	RJDSEBOTP361
CREDITS	:	2
DURATION	:	60 HOURS

LEARNING OBJECTIVES	
1	Ability to identify the plant products and their sources
2	Learn technique to extract fine chemicals from plant parts

COURSE OUTCOME NUMBER	On completing the course, the student will be able to:	PSO Addressed	BLOOMS LEVEL
CO1	Identify the Plant products and their sources	1	BT Level III, IV Apply draw conclusions
CO2	Extract natural products and apply separation techniques to purify and identify the active constituents.	1, 5	BT level III, IV and V Apply, analyze and evaluate

Course Code	Practical	Credits
RJDSEBOTP361	ECONOMIC BOTANY	2
❖ Identification of fibre yielding plants: Cotton, Jute, Agave, Coir, Bamboo, Pandanus, Kapok ❖ Extraction of fibre by retting ❖ Identification of Millets ❖ Extraction of essential oil using Clevenger - Demonstration ❖ TLC of extracted essential oil for identifying the active Phytoconstituent ❖ Identification of spices: Ginger, Cinnamon, Cloves, Saffron, Capsicum, Pepper, Star Anise, Cumin, Coriander, Caraway, Dill, Fennel, Mustard, Nutmeg, Basil, Sage		

Scheme of Examinations

1. Internal examination 20 marks by MCQ/ Assignment / Project / Survey / Presentation / Seminar.
2. One External (Semester End Examination) of 30 marks. Duration: 1 hour.
3. One Practical Examination at the end of Semester consisting of 50 marks with minimum 20 marks for passing.
4. Minimum marks for passing Semester End Theory and Practical Exam are 40%.
5. Students must appear for the Semester End Examination to be able to complete total credits for a given Semester.
6. For any KT examinations, there shall be Examination on Demand and students must register for the same.
7. A candidate will be allowed to appear for the practical examinations if he/she submits a certified Journal of T.Y.B.Sc. DSE Botany or a certificate from the Head of the Department/Institute to the effect that the candidate has completed the practical course of T.Y. B.Sc. DSE Botany as per the minimum requirements.
8. In case of loss of journal, a candidate must produce a certificate from the Head of the Department /Institute that the practical for the academic year were completed by the student. However, such a candidate will be allowed to appear for the practical examination, but the marks allotted for the journal (if any) will not be granted.
9. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

Evaluation and Assessment

(Based on the centralized guidelines given by EC under NEP 2020)

Evaluation (Theory): Total marks per course - 50.

Internals- 20 marks

External- Semester End Examination – 30 marks

Question paper covering all units and topics.

Practical Examination - 50 marks

Continuous evaluation for practical - 20 marks

Semester end examination - 30 marks

Question	Knowledge	Understanding	Application And Analysi s	Total Marks- Per Unit
Unit 1 & 2	05	03	02	10
Unit 3 & 4	05	03	02	10
Short notes from topics covering all the units	05	03	02	10
-TOTAL- Per objective	15	09	06	30
% WEIGHTAGE	50	30	20	100%

Mapping of the course to Local/ Regional/National/International relevance

The diversity existing in the Plant kingdom is unparalleled ranging from single cell to the tallest tree living on this planet. Plants represent the unique organism which fulfils the energy needs of all other organisms. With their unique metabolic capacity they can carry out biosynthesis of complex biomolecules at ambient temperature and pressure without polluting the surroundings, in fact help in obviating climate change. All courses contribute towards SDG 4 i.e. Quality Education.

Class	Course Name	Course Code	Local relevance	Regional relevance	National relevance	International relevance
T.Y.B.Sc. Botany Major DSE I	Economic Botany Theory	RJDSEBOT361	✓	✓	✓	✓
T.Y.B.Sc. Botany Major DSE I	Economic Botany Practical	RJDSEBOTP361	✓	✓	✓	✓

Mapping of the course to Employability/ Entrepreneurship/Skill development

The courses in Botany have been designed to impart one or more skills to make students employable.

Class	Course Name	Course Code	Topic focusing on Employability/ Entrepreneurship/ Skill development	Employability/ Entrepreneurship/ Skill development	Specific activity
T.Y.B.Sc. Botany Major DSE I	Economic Botany Theory	RJDSEBOT361	All topics	Teaching, research	
T.Y.B.Sc. Botany Major DSE I	Economic Botany Practical	RJDSEBOTP361	All Practical's	Teaching, research, Natural product industries, Botanical artifacts, and start up	

Integration of Cross cutting Issues

Class	Course Code	Cross Cutting Issues
T.Y.B.Sc. Botany Major DSE I	RJDSEBOT361 RJDSEBOTP361	Ethics, Environment UNSDG 4, 13 NEP 2020 Interdisciplinary