

COURSES OF STUDY - SCIENCE FACULTY

I & II Semester (F.Y.B.Sc.)

A student is required to offer the following 8 Papers.

Compulsory Papers (2 Papers)

- 1) Information Technology (I.T.)
- 2) Environmental Studies (Ev.S.)

Major Papers (3 subjects x 2 Papers each = 6 Papers)

The following subject combinations are allowed in Major Subject Category :
(Students can offer any one of the following subject combinations.)

Major A	Physics - Chemistry - Mathematics
Major B	Physics - Chemistry - Botany
Major C	Microbiology - Chemistry - Zoology
Major D	Chemistry - Ind. Chemistry - Mathematics
Major E	Chemistry - Botany - Zoology

In all, there will be two Papers each in three subjects under Major category. Each Paper will have Theory component & Practical component. In case of Mathematics both the papers shall have theory component only.

In all, there will be total Eight Papers (Seven Papers carrying 100 marks each and one Papers of 50 marks.)

III & IV Semester (S.Y.B.Sc.)

Compulsory subjects

1. Ecology
2. Entrepreneurship Development
(For Industrial Chemistry Students only)

Major Subject Category

Same subject Combination as offered in Semester I & II

Semester V & VI (T.Y.B.Sc.)

The Following subject combinations are offered :

6 Units of 1 subject (Entire)

- 1) Chemistry
- 2) Botany
- 3) Zoology
- 4) Microbiology
- 5) Physics

3 Units of 2 Subjects

- 1) Physics – Mathematics
- 2) Chemistry – Industrial Chemistry

PRESCRIBED SYLLABUS - SCIENCE FACULTY

a) BOTANY

Semester I :

- | | | |
|---------|------------|---|
| Major I | (Paper I) | : Diversity and Classification of Plant Kingdom – I |
| Major I | (Paper II) | : Cell Biology : Structure Organisation.
(Practicals I & II) |

Semester II :

- | | | |
|----------|-------------|--|
| Major II | (Paper III) | : Diversity and Classification of Plant Kingdom – I |
| Major II | (Paper IV) | : Principles of Biochemistry
(Practicals III & IV)
(Field Trip – Two Local Field Trips.) |

Semester III

- | | |
|------------|--------------------|
| Paper V : | Plant Physiology I |
| Paper VI : | Plant Ecology I |

Semester IV

- | | |
|---|-----------------------|
| Paper VII | : Plant Physiology II |
| Paper VIII | : Plant Ecology II |
| (Paper V, VI, VII, VIII will have Practical) | |
| (Field Trip : Two local trips and one long trip of
three days duration outside Goa.) | |

Botany (Six units)

Semester V	Paper IX	: Systematics of Angiosperms
	Paper X	: Genetics and Plant Breeding
	Paper XI	: Plant Biochemistry and Molecular Biology.
	Paper XII	: Plant Biotechnology and Genetic Engineering.
	Botany Project (Practicals -IX, X, XI, XII)	
Semester VI	Paper XII	: Plant Anatomy and Developmental Biology of flowering plants.
	Paper XIV	: Genetics, Plant Breeding and Statistical Methods.
	Paper XV	: Microbiology & Plant Pathology
	Paper XVI	: Economics & Applied Botany
	Botany Project (Practicals -XIII, XIV, XV, XVI)	

b) CHEMISTRY

Semester – I	CH – 101	: Physical & Inorganic Chemistry
	CH – 103	: Organic & Inorganic Chemistry Practicals
Semester – II	CH – 102	: Physical & Inorganic Chemistry
	CH – 104	: Organic & Inorganic Chemistry Practicals

INDUSTRIAL CHEMISTRY

Semester – I	IC – 101	: General Industrial Chemistry
	IC – 103	: Materials Balance & Utilities Practicals
Semester – II	IC – 102	: General Industrial Chemistry
	IC – 103	: Energy Balance & Unit Operations. Practicals
Semester III	Ch 201	: Chemistry Paper I
	Ch 202	: Chemistry Paper II Practicals
Semester IV	Ch 203	: Chemistry Paper I
	Ch 204	: Chemistry Paper II Practicals

INDUSTRIAL CHEMISTRY**Semester III**

IC 20	:	Ind. Chemistry Paper I
IC 202	:	Ind. Chemistry Paper II Practicals

Semester IV

IC 203 : Ind. Chemistry Paper I
IC 204 : Ind. Chemistry Paper II
Practicals

Semester– V (Six Units)

Theory : 400 marks
Paper – I Physical Chemistry
Paper – II : Inorganic Chemistry
Paper – III Organic Chemistry
Paper – IV : Analytical / Pharmaceutical Chemistry
Practicals : 200 marks

Paper – I & Paper II
Project work : To be started

Semester – VI (Six Units)

Theory – 400 marks
Paper – I : Physical Chemistry
Paper – II : Inorganic Chemistry
Paper – III : Organic Chemistry
Paper – IV : Analytical / Pharmaceutical Chemistry
Practicals : 200 marks
Project work : Given in Sem. V to be evaluated

Semester – V Three – Units

Theory : 200 marks
Paper – I : Physical and Inorganic Chemistry
Paper – II : Organic and Analytical Chemistry
Practicals : 100 marks
Project work : To be started

Semester–VI (Three- Units)

Theory : 200 marks
Paper – I : Physical and Inorganic Chemistry
Paper – II : Organic and Analytical Chemistry

Practicals : 100 marks

Project work : To be evaluated

Industrial Chemistry

Semester – V IC – 301 : Ind Chemistry Paper – I
IC – 303 : Ind Chemistry Paper II
Practicals

Semester –VI IC – 302 : Ind. Chemistry Paper
IC – 304 : Ind Chemistry Paper II
Practicals

c) MATHEMATICS

Semester I Paper I : Calculus of one variable

Semester I Paper II : Analytical Geometry.

Semester II Paper I : Discrete Mathematics

Semester II Paper II : Probability and Statistics

Semester III Paper 301 : Numerical methods
Paper 302 : Calculus of two variables

Semester IV Paper 401 : Matrix algebra
Paper 402: Differential equations - I
(Paper 301, 401) : Both Semesters will have Practicals.)

Semester V 1) Analysis - I
2) Algebra
3) Analysis II

Semster VI 1) Metric spaces
2) Linear Algebra
3) Complex Analysis

d) MICROBIOIOGY

Semester I 101 : Introduction to Microbiology and Biochemistry - 1
102 : Basic Techniques in Microbiology - 1
Practical 101, Practical 102.

Semester II 103 : Introduction to Microbiology and Biochemistry – 2
104 : Basic Techniques in Microbiology – 2
Practical 103, Practical 104

Semester III	201 :	Microbial Physiology – I
	202 :	Microbial Genetics – I
		Practical 201, Practical 202
Semester IV	203 :	Microbial Physiology – II
	204 :	Microbial Genetics – II
		Practical 203, Practical 204
Semester V	301 :	Environmental Microbiology
	302 :	Medical Microbiology
	303 :	Practical (301 + 302)
	304 :	Molecular Biology
Semester VI	305 :	Industrial Microbiology
	306 :	Practical (304 + 305)
	307 :	Ecology and Agricultural Microbiology
	308 :	Chemotherapy and Immunology
	309 :	Practical (307 + 308)
	310 :	Genetic Engineering
	311 :	Food Microbiology
	312 :	Practical (310 + 311)

e) PHYSICS

Semester I	Paper 1 :	Mechanics and Properties of Matter
	Paper 2 :	Electricity
	Practical :	I and II
Semester II	Paper 1 :	Waves and Acoustics
	Paper 2 :	Optics
	Practical :	I and II
Semester III	Paper 1 :	Mechanics II
	Paper 2 :	Electronics
Semester IV	Paper 1 :	Heat and Thermodynamics
	Paper 2 :	Modern Physics
	Practical :	I and II
Semester V	Paper 1 :	Electronics
	Paper 2 :	Wave mechanics*
	Paper 3 :	Nuclear Physics

Paper 4	Electromagnetic theory*
Paper 5	Practical I (Section 1 and 2)
Paper 6	Practical II* (Section 1 and 2)

Semester VI	Paper 1 :	Solid state devices and Instrumentation
	Paper 2 :	Atomic and molecular physics*
	Paper 3 :	Thermodynamics and statistical mechanics
	Paper 4 :	Electromagnetic theory II and Relativity*
	Paper 5 :	Practical I (Paper 1 + 2) (Section 1 and 2)
	Paper 6 :	Practical II (Paper 3 + 4) (Section 1 and 2)
	Final Project :	Physics Project

** Indicates paper and practical for three units B.Sc. degree course students.*

f) ZOOLOGY

Semester I	ZT 1	:	Diversity of lower Non-Chordates
	ZP 1	:	Practicals : Diversity of Lower Non-Chordates.
	ZT 2	:	Cell Biology
	ZP 2	:	Practicals : Cell Biology
Semester II	ZT 3	:	Diversity of higher Non-Chordates
	ZP 3	:	Practicals of higher Non-Chordates
	ZT 4	:	Genetics & Molecular Biology
	ZP 4	:	Practicals of Molecular Biology
			Field Trip : Two Local Field Trips
Semester – III	ZT 5	:	Diversity of Lower Chordates
	ZT 6	:	Animal Physiology
	ZP 5	:	Diversity of Lower Chordates Practical
	ZP 6	:	Animal Physiology Practical
Semester IV	ZT 7	:	Diversity of Higher Chordates
	ZT 8	:	Ecology & Animal Behaviour
	ZP 7	:	Diversity of Higher Chordates
	ZP 8	:	Ecology & Animal Behaviour
			Field Trip : Two local trips and one long of three days duration outside Goa.

Semester V

- ZP -09 : Comparative Anatomy of Vertebrates
- ZP-10 : Human Physiology & Biochemistry
- ZP -11 : Applied Genetics & Evolution
- ZP-12 : Basic Animal Biotechnology
- ZLC-01 : Practicals :
 - a. Comparative Anatomy of Vertibrates
 - b. Human Physiology & Biochemistry
- ZLC-02 : Practicals :
 - a. Applied Genetics & Evolution
 - b. Basic Animal Biotechnology

VI Semester

- ZP-13 : Development Biology
 - ZP-14 : Endocrinology
 - ZP-15 : Environmental Biology & Toxicology
 - ZP-16 : Animal Biotechnology Applications
 - ZLC-03 : Practicals :
 - a. Developmental Biology
 - b. Endocrinology
 - ZLC-04 : Practicals :
 - a. Environmental Biology & Toxicology
 - b. Animal Biotechnology Applications
- Field Trip : 3 local trips and one long trip of 10 days duration.