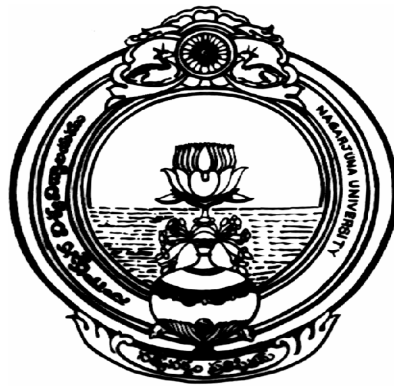


# **MODIFIED CURRICULUM B.Sc.**



**From the batch of Students  
admitted in the Academic year  
2008-09**

**ACHARYA NAGARJUNA UNIVERSITY  
NAGARJUNA NAGAR – 522 510**

## **B. Sc COURSE STRUCTURE**

**First Year w.e.f. the Academic Year 2008-09  
(From the batch of Students admitted in the year 2008-09)**

### **Part – I :**

S.No.	Subject	Hrs per week	No of Marks
1	English Language including communication skills	6	100
2	Second language	4	100
3	Contemporary India: Economy, Polity and Society (foundation Course)	3	100
4	Introduction to computers (Computer Course)*	2	100
	<b>Total</b>	15	<b>400</b>

### **Part – II :**

S.No.	Subject	Hrs per week	No of Marks
5	Core – 1 – I	4	100
6	Core – 2 – I	4	100
7	Core – 3 – I	4	100
8	Core – 1 – Lab – I	3	50
9	Core – 2 – Lab – I	3	50
10	Core – 3 – Lab – I	3	50
	<b>Total ::</b>	21	<b>450</b>
	<b>Grand Total ::</b>	36	<b>850</b>

\* For all B.A & B.Sc. programmes with no Computer Course as core subject

**Note:** 1. All are credit Subjects for award of Pass / Class

2. For those subjects modified curriculum is not given, the old syllabus holds good.

3. Model question papers that are not available with this booklet will be sent to the Colleges in due course.

# First Year ENGLISH Syllabus

## PAPER - I (Part - I)

Max.Marks:100

Part -A (50 Marks)

### POETRY

<u>Title of the Poem</u>	<u>Name of the Poet</u>
1. Ode to Autumn	John Keats
2. Dover Beach	Matthew Arnold
3. The Unknown Citizen	W. H. Auden
4. Poem - 36	Rabindranath Tagore
5. Myriad-Winged Bird	A. Satyavathi Devi
6. Telephone Conversation	Wole Soyinka

### PROSE

<u>Title of the Prose Lesson</u>	<u>Name of the Author</u>
1. Is Progress Real?	Will Durant
2. Stephen Leacock	Conjuror's Revenge
3. The Best Investment I Ever Made	A. J. Cronin
4. Prospects of Democracy	Dr. B. R. Ambedkar
5. I Have a Dream	Martin Luther King
6. Letter to a Teacher	Nora Rossi and Tom Cole

### GRAMMAR AND VOCABULARY

1. Reading Comprehension
2. Verb Forms
3. Right Words (Synonyms, Antonyms, Homonyms and One-Word Substitutes)
4. Idioms
5. Detection of Errors

### FURTHER READING FOR FIRST YEAR

#### Short Stories:

- |                                    |             |
|------------------------------------|-------------|
| 1. How Far is the River            | Ruskin Bond |
| 2. Little Girls are wiser than Men | Leo Tolstoy |

#### One-Act Plays

- |  |                     |
|--|---------------------|
| 1. The Boy Comes Home                            | A. A. Milne         |
| 2. <i>Merchant of Venice</i> (Casket Scene only) | William Shakespeare |

### LANGUAGE USAGE

1. Punctuation (to be given from a one-act play)
2. Dialogue Writing (to be given from a short story)

**Part - B (50 marks)**  
**COMMUNICATION CURRICULUM**

<b>YEAR - I COMMUNICATION CURRICULUM</b>				
<b>Year - I/ Level - I Modules</b>	<b>Topics</b>	<b>Concepts / Activities</b>	<b>Time Frame 40 Hours</b>	<b>Additional Infrastructure Requirement</b>
1-B-1 Spoken English	1. Neutralization of Accent- Pronunciation	<ul style="list-style-type: none"> <li>• Intro to English sounds</li> <li>• Practice in identifying Vowels</li> <li>• Symbols, words, stress, using Consonants(GIE)</li> <li>• The dictionary, common words (Contrasted with Br.E, Am.E)</li> <li>• Syllables</li> <li>• Stress</li> <li>• Intonation Reducing MTI- Problematic Sounds of regional Language</li> </ul>	15	Sound System
	2. Formal / Informal English differences Monologue / Dialogue	<ul style="list-style-type: none"> <li>• Self - Introduction</li> <li>• Hobbies and favorites</li> <li>• Greeting people</li> <li>• Giving instructions/directions, making requests, asking permission, offering help</li> </ul>	5	-
	3. Telephoning Skills	<p><b>Types of calls</b></p> <ul style="list-style-type: none"> <li>• Call structure-stages of a call</li> <li>• Leaving a message</li> <li>• Role play</li> <li>• Voice modulation practice</li> </ul>	5	Speaker Phone recommended
1-B-2 Listening Comprehension	1. Listening for stress, accent, rhythm and intonation	<ul style="list-style-type: none"> <li>• Identifying sounds / word stress / intonation patterns</li> </ul>	5	Audio CD / Tapes
	2. Listening for the main idea	<ul style="list-style-type: none"> <li>• Listening to and understanding a speech / talk conversation</li> </ul>	4	Audio CD / Tapes
	3. Listening for specific information	<ul style="list-style-type: none"> <li>• Handling a cell-(live / answering machine) listening to and taking down a message</li> <li>• Following instructions / directions</li> <li>• Dictation practice</li> </ul>	4	<ul style="list-style-type: none"> <li>• Audio CD / Tapes</li> <li>• Site maps recommended</li> </ul>
	4. Listening for pleasure	<ul style="list-style-type: none"> <li>• Stories, anecdotes,</li> <li>• English songs</li> </ul>	2	Audio CD/tapes

Reference Book: A course in Listening and speaking - I

## **The Pattern of the Question Paper for the First Year : English**

1. Prose: 10 (Section - A)
2. Poetry: 10 (Section - B)
3. Additional Reading (Non-Detailed Text): 10 (Section - C)
4. Reading Comprehension , Grammar & Vocabulary: 20 (Section - D)

### **Question Paper Model**

#### **Section – A**

- I. Answer any FIVE out of EIGHT following in about 25 words:  $5 \times 2 = 10$   
(One of the questions on identifying and commenting on the given small passage from Prose)

#### **Section – B**

- II. Answer any FIVE out of EIGHT following in about 25 words:  $5 \times 2 = 10$   
(One of the questions is on identifying and commenting on the given small passage from Poetry)

#### **Section – C**

- III. Answer any FIVE out of EIGHT following in about 25 words:  $5 \times 2 = 10$   
(One of the questions is on punctuation, to be given from a one-act play)  
(One of the questions is on writing a dialogue, given from a short story)

#### **Section – D**

- IV. Reading Comprehension (An unseen passage of about 200 words):  
(Questions: 2 on facts, 1 on inference, 1 on vocabulary and 1 on grammar)  
 $5 \times 1 = 5$
- V. Fill in the blanks with suitable verb forms in the passage below: 5
- VI. Choose the right word for the given idioms and mark it:  
5
- Multiple choice questions on words (synonyms: 2, antonyms: 2, one-word substitutions & homonyms: 1)
- VII. Correct the underlined part in the following sentences: 5

**First Year SANSKRIT Syllabus**  
**Paper – I (Part – I)**

**Max. Marks: 100**

- POETRY :
- Lesson No. 1 Saranagathi  
From Valmiki Ramayanam Yuddhakanda  
17<sup>th</sup> Canto Slokas 11 – 68
- Lesson No. 2 Ahimsa Paramodharmah  
From Srimadbharatam, Adiparva 8<sup>th</sup> chapter  
Sloka 10 – to the end of 11 Chapter
- Lesson No. 3 Raghoh Audaryam  
From Raghuvamsa 5<sup>th</sup> Canto 1 – 35 Slokas
- Lesson No. 4 Modern poetry Mathrudesasya Aujvalyam  
By Dr. G.S.R. Krishna Murthy
- PROSE :
- Lesson No. 5 Mitrasampraptih  
From Pancatantra – Ist Story (Abridged)
- Lesson No. 6 Modern prose Chikroda katha  
Andhra Kavya Kathah  
By Sannidhanam Suryanarayana Sastry
- Lesson No. 7 Computer Yanthram  
By Prof. K.V. Ramakrishnamacharyulu

GRAMMAR

DECLENSIONS:

Nouns ending in Vowels:

Deva, Kavi, Bhanu Dhatr, Pitr, Go, Rama, Mati, Nadee, Tanu, Vadhoo,  
Matr, Phala, Vari & Madhu

SANDHI:

- Swara Sandhi : Savarnadeergha, Ayavayava, Guna, Vrddhi, Yanadesa
- Vyanjana Sandhi : Schutva, Stutva, Anunasikaditva, Anunasika, Latva,  
Jastva
- Visarga Sandhi : Visarga Utva Sandhi, Visargalopa Sandhi, Visarga

Repha Sandhi, Ooshma Sandhi

SAMASA :

(1) Dwandwa	(2) Tatpurusha (Common)
(2a) Karmadharaya	(2b) Dwigu
(2c) Pradi Tatpurusha	(2d) Gatitaturusha
(2e) Upapada Tatpurusha	(3) Bahuvrihi
(4) Avyayibhava	

CONJUGATIONS

Ist Conjugations – Bhoo, Gam, Shtha, Drhs Labh, Mud,

IInd Conjugation – As ( )

IIIrd Conjugation – Yudh,

IV th Conjugation – Ish

VIII Conjugation – Likh, Kri ( )

IXth Conjugation – Kreen ( )

Xth Conjugation – Kath, Bhash, Ram, Vand,

Model Question paper  
Sanskrit

<u>Ist year</u>		100 Marks
I. Question :	Essay question from poetry Two questions out of four	2X15=30
II. Question :	Essay question from prose One out of two	1X10=10
III. Annotations:	4 out of 8 from prose and poetry	4X5=20
IV (a) Translation from poetry	1 out of 2	1X4=4
(b) Translation from prose	1 out of 2	1X4=4
V. a) Sabdas (Declensions)	4 out of 8	4X2=8
b) Conjugations	3 out of 6	3X2=6
c) Sandhis	4 out of 8	4X2=8
d) Samasa	3 out of 6	3X2=6
e) Identification of gender number (Linga & Vachana)	2 out of 4	2X2=4
	<b>Total</b>	----- 100

**First Year HINDI (Second Language) Syllabus  
Paper - I (Part – I)**

**Max. Marks : 100**

**A) PROSE: ‘GADYA SANDESH’**

Editor : Dr.V.L Narasimham Shiva Koti

Published by: LORVEN Publications, Hyderabad

**Lessons Omitted :**

Sl.No	Lesson No	Title of the Lesson	Name of the Writer
01	02	Sacchi Veeratha	Sardar Puran Singh
02	04	Aam Phir Boura Gaya	Acharya Hazari Prasad Dwivedi
03	06	Vahi Ki Vahibath	Ramesh Bakshi
04	07	Pruthviraj Ki Ankhe	Dr.Ram Kumar Varma
05	09	Binda	Mahadevi Varma
06	11	Be eamani Ki Parath	Hari Sankar Parasayi

**Lessons to be Studied:**

Sl.No	Lesson No	Title of the Lesson	Name of the Writer
01	01	Sahithya Ki Mahattha	Mahaveer Prasad Dwivedi
02	03	Mithratha	Acharya Ramachandra Shukla
03	05	Poos Ki Raath	Premchand
04	08	Samakruthi aur Sahithya Ka Paraspar sambandh	Dr. G. Sunder Reddy
05	10	Bharath Ek Hai	Ramdhari Singh Dinakar
06	12	HIV / AIDS	Harib Shankar Parasayi

**B) Non – Detailed Study : ‘KATHALOK’**

Editor : Dr.Ghanashyam

Published by: SUDHA Publications, Hyderabad.

**Stories Omitted:**

Sl.No	Lesson No	Title of the Lesson	Name of the Writer
01	04	Tehs	Phaneeswara Nath 'Renu'
02	05	Jaria	Chithra Mudugal
03	08	Bhagnavashesh	Subhadra Kumari Chouhan
04	10	Aur Vah Padh Gayi	Dr. kum Viyogi

**Stories to be Studied:**

Sl.No	Lesson No	Title of the Lesson	Name of the Writer
01	01	Mukthidhan	Munshi Premchand
02	02	Goodad Sayi	Jayashankar Prasad
03	03	Usne Kaha tha	Chandradhar Sharma Gulari
04	06	Bhook Hadthal	Bala Shouri Reddy
05	07	Mai Haar Gayi	Mannu Bhandari
06	09	Paramaathma Ka Kutha	Mohan Rakesh

**C) Grammer pertaining to the following topics :**

- I. Rewriting of Sentences as directed based on: Case, Gender, Number, and Voice.
- II Correction of Sentences.
- III Usage of words into Sentences
- IV Karyalaya Hindi: Administrative terminology (Prashashanik Shabdabali)  
Official Designations (Padnaam 200 words)  
(A) Changing English term to Hindi  
(B) Changing Hindi term to English
- V Sandhi Vichched
- VI Antonyms (Virodhi Shabd)
- VII Letter – Writing: Personal letters, Official letters, Letters of Complaints,  
Application for appointment

**Books Recommended for Reference:**

1. Saral Hindi Vyakaram – D.B.H.P.Sabera,Hyderabad
- 2.Prathamik Vyakaran Evam Rachana – Harish Chandra.

**MODEL QUESTION PAPER – PATTERN**  
**B.Sc, – FIRST YEAR SECOND LANGUAGE HINDI**

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**Time – 3 hours**

**Maximum Marks – 100**

- I 3 out of 5 Annotations from the prescribed prose text: GADYA SANDESH  
3X8=24
- II 1 out 4 Long answer type questions from the prescribed prose text:  
GADYA SANDESH 1X16=16
- III 1 out of 3 long answer type questions from the prescribed Non-Detailed text:  
KATHALOK 1X12=12
- IV 1 out of 3 short answer type questions from the prescribed text Non-Detailed text  
KATHALOK 1X8=8
- V (a) Rewrite as directed.  
5 questions will be given based on Gender, Number, Tense, Voice and  
Correction of Sentences 5X1=5
- (b) Usage of words into Sentences  
5 out of 10 words 5X1=5
- (c) Translation from English to Hindi (Official Hindi Terminology) 5 out of 10  
5X2=10
- (d) Translation from Hindi to English (Official Hindi Terminology) 4 out of 8  
4X1=4
- VI 1 out of 3 letters from the prescribed letters 1X8=8
- VII (a) 4 out of 8 words for Sandhi Vichhed 4X1=4  
(b) 4 out of 8 words for opposite words 4X1=4

# **First Year FOUNDATION COURSE Syllabus**

## **Paper – I (Part – I )**

**(B.Sc. Course With effect from 2008-09 Academic Year)**

### **CONTEMPORARY INDIA : ECONOMY, POLITY AND SOCIETY**

**Max. Marks: 100**

#### **CHAPTER – I**

**Total : 60 Hours**

Basic feature of Indian Economy-Trends in National Income – Agriculture Importance- Problems- Remedial Measures; Industry: Large Scale – Small Scale; Problems and Remedial measures; A brief Review of the Industrial Policies in India. Role of Public Sector in the Context of Globalization, Growing importance of Service Sector.

**(No of Periods Per Week:8 Hours)**

#### **CHAPTER – II**

Population, poverty, unemployment and Income Inequalities – Causes and consequences – Remedies – Inflation causes and Remedies, Economic Reforms and their impact on Indian Economy – Indian Tax structure.

**(No of Periods Per Week:8 Hours)**

#### **CHAPTER – III**

Indian National movement various stages – Its legacy. Integration of Native states and Formation of modern India.

**(No of Periods Per Week:8 Hours)**

#### **CHAPTER – IV**

Basic characteristic of Indian constitution Indian Political party system, Emergence of All India Parties – Regional Parties – collation politics.

**(No of Periods Per Week:10 Hours)**

#### **CHAPTER V**

Center – State Relations – Changes and various commissions – Importance of Human Rights – Violation of Human Rights – Indian Foreign policy – non – Aligned movement – Local self Governments 73, 74 consistitutional amendments. Right to information act.

**(No of Periods Per Week:10 Hours)**

#### **CHAPTER – VI**

Salient features of Indian Social system, Social groups: Primary and Secondary, Association – Institution. Status and Role – Norms, Values and customs. Concept of Socialization – Agencies of Socialization:

**(No of Periods Per Week:10 Hours)**

## CHAPTER – VII

Gender Issues : Domestic violence, Women Empowerment Entrepreneurship Programmes: a brief mention of Different on going Welfare Schemes of the central and State Government for Women, Children aged and Youth. Child Labour: causes – prevention

(No of Periods Per Week:6

Hours)

### RECOMMENDED REFERENCE BOOKS

1. Indian Economy – Rudia Dutt and Sundaram KPM
2. Indian Economy – Mishra and Puri
3. Indian Economic Development – Environmental Problems – Telugu Academy.
4. Indian Constitution – Pendyala Satyanarayana
5. Center – State Relations –Prof. M.Venkata Rangaiah
6. Indian Constitution – M.V.Pylee.
7. India After Independence – Bipinchandra (1947-2000)
8. Indian Political System – N.D.Palmer
9. India : Government and Politics in a Developing India – Hardgrave R.L.
10. India Since 1526 – V.D.Mahajan
11. International Relations Since 1919 –Atul Chandra Roy
12. Indian History and Culture – Volume II (1526-1965) – Dr. BSL: Hanumantharao and K.Basaveswara Rao
13. Indian History and Culture – Volume – II – Telugu Academy
14. Understanding Society – S.C.Dube
15. The Structure of Hindu Society – N.K.Bose
16. Indian Social Scene – N.V.Joshi and Uma Joshi.
17. Indian Society – RN Sarma
18. Social Movements in India – M.S. A.Rao
19. Poverty in India – V.M.Dandekar and Neelakanth Rath
20. Indian women through the ages – P.Thomas
21. Introductory Sociology – S Sen Gupta
22. Human Rights and Working Women – Jayashree Gupta
23. Women and Development – Telugu Academy
24. Society construction and change – Telugu Academy
25. Empowering The Indian Women – Prameela Kapur
26. Indian Social System – Ram ahuja
27. Social Background of Indian Nationalism – A.R.Desai
28. Publications of the Ministry of I & B, Govt. of Indian Publications of I & PR Department of Govt. of Andhra Pradesh.

**MODEL QUESTION PAPER**  
**Contemporary India – Economy, Polity and Society**

**Examinations At The End of Ist Year Degree (Under graduate Programme)**  
**Common to all Ist Year Degree Students (B.A/BS.c/B.Com Courses)**

**Time: 3 Hours**

**Max. Marks: 100**

**Section – A**

**4X15=60**

Answer any **Four** of the following Questions.  
Each Question Carries **15** Marks

1. What are the Problems of Agriculture Sector  
(or)  
Explain the role of Public sector in the context of Globalization
2. Explain the Salient features of Indian Social System  
(or)  
Define Socialization and Write the agencies of Socialization
3. Explain in detail the Various stages of Indian National Movement  
(or)  
What factors influenced for taking up the Project of Integration of Native states
4. Explain the Nature of Indian Political System  
(or)  
Write any Essay on Centre – State relations

**Section – B.**

**8X5=40**

Answer any **Eight** of the following Questions.  
Each Question Carries **Five** Marks.

5. Causes for Poverty
6. Unemployment – Remedies
7. Effects of Inflation
8. Importance of Direct Trades
9. Secondary Groups
10. Women Empowerment
11. Causes for Child Labour
12. Achieved and ascribed status
13. Regional Parties
14. What are called Human Rights
15. Local Self Governments
16. Right to Information Act

**First Year B.Sc.  
INTRODUCTION TO COMPUTERS**

**Paper – I (Part – I )**

**Max. Marks: 100  
60 hrs ( 2 hrs per week)**

**Unit – I : Exploring Computers**

**12 hrs**

Exploring computers and their uses:

Overview : Computers in our world, The computer defined, Computers for individual users, Computers for organizations, Computers in society, Why are computers so important.

Looking inside the computer system:

Overview: Detecting the ultimate machine, the parts of a computer system, the information processing cycle, Essential computer hardware: Processing devices, memory devices, input and output devices, storage devices, system software, application software, Computer Data, Computer users.

Using the keyboard and mouse:

Overview: The keyboard and mouse, The keyboard, how the computer accepts input from the keyboard, the mouse, variants of the mouse, ergonomics and input devices.

Inputting data in other ways:

Overview: Options for every need and preference, Devices for hand, optical input devices, Audio-visual input devices.

Video and Sound :

Overview: Reaching our senses with sight and sound, monitors, ergonomics and monitors, data projectors, sound systems.

**Unit – 2 : Storage Devices and Operating System Basics**

**12 hrs**

Printing:

Overview: Putting digital content in your hands, commonly used printers, High-quality printers, thermal-wax printers, Dye-sublimation printers, plotters.

Transforming data into information:

Overview: The difference between data and information, how computers represent data, how computers process data, machine cycles, memory, factors effecting processing speed, The Computer's internal clock, the Bus, Cache memory.

Types of storage devices:

Overview: An ever-growing need, Categorizing storage devices, magnetic storage devices – How data is stored on a disk, how data is organized on a magnetic disk, how the operating system finds data on a disk, Diskettes, hard disks, removable high-capacity magnetic disks, tape drivers, optical storage devices, solid-state storage devices, smart cards, solid-state disks.

Operating system basics:

Overview: The purpose of operating systems, types of operating systems, providing a user interface, running programs, managing hardware, enhancing an OS utility software.

Networking Basics:

Overview: Sharing data anywhere , anytime, the uses of a network, common types of networks, hybrid networks, how networks are structured, network topologies and protocols, network media, network hardware.

### **Unit – 3      Data Communications and Computer Programs**

**12 hrs**

Data Communications :

Overview: The local and global reach of network, data communications with standard telephone lines and modems, modems, uses for a modem, using digital data connections, broad band connections, wireless networks.

Productivity software:

Overview: Software to accomplish the work of life, Acquiring software, commercial software, freeware and public domain software, Open-source software, word processing programs, spreadsheet programs, presentation programs, presenting information managers.

Database management systems:

Overview: The mother of all computer applications, databases and database management systems, working with a database.

Creating computer programs:

Overview : What is a computer program, Hardware/Software interaction, Code, machine cod, programming languages, compilers and interpreters, planning a computer program, how programs solve problems.

Programming languages and the programming process:

Overview: The keys to successful programming, the evolution of programming languages, world wide web development languages, the systems development life cycle for programming.

**Unit – 4 :****MS – Word****12 hrs**

Word Basics: Starting word, creating a new document, Opening preexisting document, the parts of a word window, typing text, selecting text, deleting text, undo, redo, repeat, inserting text, replacing text, formatting text, cut, copy, paste – Formatting text and Documents: Auto format, Line spacing margins, Borders and Shading.

Headers and Footers : Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd even pages.

Tables: Creating a simple table, creating a table using the table menu, Entering and editing text in table, selecting in table, adding rows, Changing row heights, deleting rows, inserting columns, deleting columns, changing column width.

Graphics : Importing graphics , clipart, insert picture, Clip art Gallery, using word's drawing features, drawing objects, text in drawing.

Templates: Template types, using templates, exploring templates, modifying templates.

Macros: Macro, Record in macros, editing macros, running a macro.

Mail Merge: Mail Merge concept, main document , data sources, merging data source and main document, overview of word menu options word basic tool bar.

**Unit – 5****MS-Power Point****12 hrs**

Power Point : Basics, Terminology, Getting started, Views

Creating Presentations: Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, deleting a slide, numbering a slide saving presentation, closing presentation, printing presentation elements.

**Prescribed Books :**

1. Peter Norton, Introduction to Computers, sixth Edition, Tata McGraw Hill(2007) (Chapters 1,2,3,4,5,6,7,10,11,12)
2. Ran Mansfield, working in Microsoft office, Tata McGraw Hill (2008). (Chapters 4 to 9, 11, 12, 24, 25, 28)

**Reference Books :**

1. Michael Miller, Absolute Beginner's guide to computer Basics, Fourth Edition, Pearson Education (2007).
2. Deborah Morley, Charles S.Parker, understanding computers today and tomorrow, 11<sup>th</sup> edition, Thomson (2007).
3. Ed Bott, woody Leonhard, using Microsoft Office 2007, Pearson Education (2007).

**Model Question Paper**  
**B.A & B.Sc : 1<sup>st</sup> Year : Paper – I**  
**Introduction to Computers**

**Time 3 Hrs**

**Max. Marks: 100**

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**Section – A**

- 1. Answer all the following questions. 10X2 = 20 Marks**
- a) Define a protocol
  - b) What is broadband technology?
  - c) What are translators?
  - d) Give some examples for application soft wares?
  - e) What is the difference between 'paste' and 'paste special'?
  - f) What are hot keys?
  - g) What is a hub?
  - h) What are device drivers?
  - i) What is a control panel?
  - j) What is the use of storing data in registers?

**Section - B**

- 2. Answer all the following questions. 5X16 = 80 Marks**
- a) Classify the computers according to their size and functionality
  - b) Explain different types of storage devices necessary for backup.  
(or)
  - c) Discuss in brief different input devices available
  - d) Draw the block diagram of a computer and explain it.
- 3.**
- a) What is an operating system? Explain different types of operating systems?
  - b) Discuss the minimum hardware needed for networking.  
(or)
  - c) What are the different impact printers available?
  - d) Discuss the functionality of data bus and address bus.
- 4.**
- a) What is the role played by wireless technology in networking?  
Discuss the hardware needed for wireless networking.
  - b) Discuss the various ways of obtaining software in brief.  
(or)
  - c) What is a computer language? Explain different types of computer languages.
  - d) Discuss the steps involved in developing a program. Also, discuss how programs solve problems.
- 5.**
- a) Explain different parts of a word window. Draw a neat diagram depicting the Various entities.
  - b) What are headers and footers? Explain in detail the procedure to create headers and footers.  
(or)
  - c) Discuss the functionalities of a word processor.  
How far M.S. Word accomplishes those features ? **(6M)**
  - d) What are the various views of a word window ? **(5M)**
  - e) Discuss the various ways of drawing tables in word. **(5M)**
- 6.**
- a) How can we give animation effects for the objects in power point ?
  - b) What is the importance of slide master view in power point?  
(or)
  - c) How auto-content wizard eases the way to create presentations?
  - d) What are design templates? Also, discuss how can we import a slide from an Outside presentation.

# First Year BOTANY Syllabus

## Paper – I (Part – II)

Max. Marks: 100

### Microbial, Diversity, Cryptogams and Gymnosperms

(Total Hours of Teaching: 120 @ 4 h / Week)

#### Unit - I: Diversity of Microbes

(30 h)

1. Introduction to Microbiology – Whittaker's Five Kingdom concept. Prokaryotes and Eukaryotes. (2 h)
2. **Viruses:** Structure, replication and transmission – Viral diseases : TMV, Yellow Vein Cleaning of Bhindicausative agent symptoms & control. (8 h)
3. **Bacteria:** Introduction to Archaeobacteria and Eubacteria. Structure, nutrition and reproduction. Bacterial diseases : Citrus canker & Leaf Blight of Rice – Pathogen, Symptoms and Control. (8 h)
4. **Cyanobacteria:** Thallus organisation & Cell structure. Structure and life history of *Oscillatoria*, *Nostoc* and *Anabaena*. Uses (Biofertilizers) (8 h)

#### Unit - II: Algae and Fungi

(32 h)

5. **Algae:** General account, thallus organisation, outlines of classification & economic importance (4 h)
6. Structure, reproduction, life history and systematic position of *Oedogonium*, *Vaucheria*, *Chara*, *Ectocarpus* and *Polysiphonia*. (12 h)
7. **Fungi:** General characters outlines of classification . (3 h)
8. Structure, reproduction and life history of *Albugo*, *Saccharomyces*, *Penicillium*, *Puccinia*, *Alternaria*,  
General account of plant diseases caused by Fungi and their control. (10 h)
9. **Lichens:** Structure and reproduction; ecological and economic importance. (3 h)

#### Unit - III: Bryophyta and Pteridophyta

(32 h)

10. **Bryophyta:** General characters out lines of classification. (3 h)
11. Structure, reproduction, life history and systematic position of *Marchantia*, *Anthoceros* and *Polytrichum*. (Development details not required) Evolution of Sporophyte in Bryophytes. (10 h)
12. **Pteridophyta:** General characters out lines of classification (5 h)

13. Structure, reproduction, life history and systematic position of *Rhynia*, *Lycopodium*,  
*Equisetum* and *Marsilea*. (*Development details not required*) (12 h)

14. Evolution of stele, Heterospory and seed habit in Pteridophytes. (2 h)

**Unit - IV: Gymnosperms and Palaeobotany (26 h)**

15. **Gymnosperms:** General characters, structure, reproduction outlines of classification &  
economic importance. (4 h)

16. Morphology of Vegetative and reproductive parts, systemic position, life history of  
*Pinus* and *Gnetum* (8 h)

17. **Palaeobotany:** Introduction - Fossils and their importance and out line of Fossilization  
& Geological time scale . (6 h)

18. Bennettitales: General account (4 h)

**Suggested Readings:**

Alexopolous, J. and W. M. Charles. 1988. Introduction to Mycology. Wiley Eastern, New Delhi.

Mckane, L. and K. Judy. 1996. Microbiology – Essentials and Applications. McGraw Hill, New York.

Pandey, B. P. 2001. College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.

Pandey, B. P. 2006. College Botany, Vol. II: Pteridophyta, Gymnosperms and Paleobotany. S. Chand & Company Ltd, New Delhi.

Pandey, B. P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company Ltd, New Delhi.

Sambamurthy, A. V. S. S. 2006. A Textbook of Plant Pathology. I. K. International Pvt. Ltd., New Delhi.

Sambamurthy, A. V. S. S. 2006. A Textbook of Algae. I. K. International Pvt. Ltd., New Delhi.

Sharma, O. P. 1992. Textbook of Thallophyta. McGraw Hill Publihing Co., New Delhi.

Sporne, K. R. 1965. Morphology of Gymnosperms. Hutchinson Co., Ltd., London.

Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.

Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany - Pteridophyta (Vascular Cryptogams). S. Chand & Company Ltd, New Delhi.

Vashishta, B. R., A. K. Sinha and V. P. Singh. 2008. Botany for Degree Students: Algae. S. Chand & Company Ltd, New Delhi.

Vashishta, B. R., A. K. Sinha and Adarsha Kumar. 2008. Botany for Degree Students: Bryophyta. S. Chand & Company Ltd, New Delhi.

Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany for Degree Students: Gymnosperms. S. Chand & Company Ltd, New Delhi.

Vashishta, B. R. 1990. Botany for Degree Students: Fungi, S. Chand & Company Ltd, New Delhi.

Watson, E. V. 1974. The structure and life of Bryophytes, B. I. Publications, New Delhi.

Practical – I

Max. Marks: 50

**Microbial Diversity, Cryptogams and Gymnosperms**

(Total Hours of Laboratory Exercises: 90 @ 3 h / Week in 30 Sessions)

**Suggested Laboratory Exercises:**

- 1 Knowledge of equipment used in Microbiology: Spirit lamp, Inoculation loop, Hot air oven, Autoclave / Pressure cooker, Laminar air flow / Inoculation chamber, Incubator, etc. (3 h)
- 2 Preparation of solid and liquid media for culturing of microbes (Demonstration) (9 h)
- 3 Study of viruses and bacteria using electron micrographs (photographs). (3 h)
- 4 Gram staining of Bacteria (3 h)
- 5 Study of symptoms of plant diseases caused by viruses and bacteria:  
**Viruses:** Tobacco mosaic virus, Yellow vein clearing of bhendi, (3 h)  
**Bacteria:** Citrus canker, Leaf blight of Rice. (3 h)
6. Vegetative and reproductive structures of the following taxa:  
**Algae:** *Oscillatoria*, *Nostoc*, *Anabena*, *Oedogonium*, *Vaucheria*, *Ectocarpus* and *Polysiphonia*. (6 h)  
**Fungi:** *Albugo*, *Saccharomyces*, *Penicillium*, *Puccinia* and *Alternaria*. (6 h)
7. Section cutting of diseased material infected by Fungi and identification of pathogens as per theory syllabus. (6 h)
8. **Lichens:** Different types of thalli and their external morphology (3 h)
9. Morphology (vegetative and reproductive structures) and anatomy of the following taxa:  
**Bryophytes:** *Marchantia*, *Anthoceros* and *Polytrichum*. (9 h)  
**Pteridophytes:** *Lycopodium*, *Equisetum* and *Marsilea*. (12 h)  
**Gymnosperms:** *Pinus* and *Gnetum*. (6 h)
10. Fossil forms using permanent slides / photographs: *Rhynia* and *Cycadeoidea* (3 h)
11. Symptoms of plant diseases caused by Fungi : Tikka disease of Groundnut, Late blight of Potato, Ergot of Bajra, Whip smut of Sugarcane, Wheat rust, Brown spot of Rice, Rice (Paddy) blast, Head smut of Sorghum, Little leaf disease of Brinjal (3 h)
12. Enumeration and examination of important microbial, fungal and algal products: Biofertilizers, protein capsules, antibiotics, mushrooms, SCP, Agar-agar etc. (6 h)
13. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies) (6 h)

MODEL QUESTION PAPER FOR THEORY PAPER

Time: **3 Hrs**

Max. Marks: **100**

*Instructions to the candidates:* Draw neat labeled diagrams wherever necessary.

**Section: A**

*(Instructions to the question PAPER SETTER: Set at least TWO questions from EACH UNIT of the given syllabus).*

Define or explain **ALL** of the following (10 X 2 = **20** Marks):

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Section: B**

*(Instructions to the question PAPER SETTER: Set at least ONE question from EACH UNIT of the given syllabus).*

Write short answers for **FOUR** of the following (4 X 5 = **20** Marks):

- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

**Section: C**

*(Instructions to the question PAPER SETTER: Set TWO questions from EACH UNIT of the given syllabus).*

Write detailed answers for **ALL** of the following (4 X 15 = **60** Marks):

**UNIT - I**

17. (a)  
(OR)

(b)

**UNIT - II**

18. (a)  
(OR)

(b)

**UNIT - III**

19. (a)  
(OR)

(b)

**UNIT - IV**

20. (a)  
(OR)

(b)

**MODEL QUESTION PAPER FOR PRACTICAL EXAMINATION  
&  
SCHEME FOR VALUATION**

Time: **3h**

Maximum Marks: **50**

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**Note:** Questions to be set based on prescribed Laboratory Exercises in the following pattern

**1. Major Laboratory Exercise: 15 Marks**

- For in-depth testing of scientific and major technical skills of students.

Perform / conduct the experiment or prepare the given material by taking sections and doing staining for scientific study.

**Scheme for valuation:** Procedure – 3 marks + Experimentation – 6 marks + Observations or recording of results – 3 marks + Discussion – 3 marks (*Total: 15 Marks*).

**2. Minor Laboratory Exercise: 10 Marks**

- To test minor technical skills of students

Make suitable minor preparation of the given plant material(s) for scientific study.

**Scheme for valuation:** Preparation – 5 marks + Identification - 3 + Discussion – 2 marks (*Total: 10 Marks*)

**3. Scientific observation and data analysis: (5 Marks)**

Using specimens / scientific data in a Figure / Photograph / Table / Diagram etc

**Scheme for valuation:** Observation – 2 marks + Identification – 1 mark + analysis – 2 marks (*Total: 5 Marks*)

**4. Critical notes on (FIVE) spotters of scientific interest: 10 Marks**

Using specimen/slide/photograph/data in a Figure or Table

**Scheme of valuation:** Identification – 1 mark + Notes – 1 mark for each spotter (*Total: 10 Marks for five spotters*)

**5. Viva-Voce (Interactive testing): 5 Marks**

- To assess soft skills and involvement of students in doing laboratory exercises

**6. Record(s) and submissions:** (Scientific preparations / collections like preserved specimens, slides, herbarium, working models, clippings of scientific articles, etc.) **5 Marks**

# First Year BIOCHEMISTRY Syllabus

## Paper – I (Part – II)

Max. Marks: 100

### BIOMOLECULES AND ENZYMOLOGY

120 hrs  
(4 hrs / week)

#### **Unit – I : Carbohydrates and Lipids**

**30 hours**

Water as a biological solvent and its role in biological processes.

Carbohydrates: Classification, monosaccharides, D and L designation, open chain and cyclic structures, epimers and anomers, mutarotation, reactions of carbohydrates (due to functional groups - hydroxyl, aldehyde and ketone). Amino sugars, Glycosides. Structure and biological importance of disaccharides (sucrose, lactose, maltose, isomaltose, trehalose), trisaccharides (raffinose, melezitose), structural polysaccharides (cellulose, chitin, pectin) and storage polysaccharides (starch, inulin, glycogen). Glycosaminoglycans, Bacterial cell wall polysaccharides. Outlines of glycoproteins, glycolipids and blood group substances.

Lipids: Classification, saturated and unsaturated fatty acids, structure and properties of fats and oils (acid, saponification and iodine values, rancidity). General properties and structures of phospholipids, sphingolipids and cholesterol. Prostaglandins- structure and biological role of  $PGD_2$ ,  $PGE_2$  and  $PGF_{2\alpha}$ . Lipoproteins: Types and functions

Biomembranes: Behavior of amphipathic lipids in water- formation of micelles, bilayers, vesicles, liposomes. Membrane composition and organization – Fluid mosaic model.

#### **Unit-II : Amino Acids, Peptides and Proteins**

**30 hours**

pH, Buffers, Henderson- Hasselbalch equation.

Amino Acids: Classification, structure, stereochemistry, chemical reactions of amino acids due to carbonyl and amino groups. Titration curve of glycine and pK values. Essential and non-essential amino acids, non-protein amino acids. Peptide bond - nature and conformation. Naturally occurring peptides – glutathione, enkephalin.

Proteins: Classification based on solubility, shape and function. Determination of amino acid composition of proteins. General properties of proteins, denaturation and renaturation of proteins. Structural organization of proteins- primary, secondary, tertiary and quaternary structures (Eg. Hemoglobin and Myoglobin), forces stabilizing the structure of protein. Outlines of protein sequencing.

#### **Unit-III : Nucleic Acids and Porphyrins**

**25 hours**

Nature of nucleic acids. Structure of purines and pyrimidines, nucleosides, nucleotides. Stability and formation of phosphodiester linkages. Effect of acids, alkali and nucleases on DNA and RNA. Structure of Nucleic acids- Watson-Crick DNA double helix structure, introduction to circular DNA, super coiling, helix to random coil transition, denaturation of nucleic acids- hyperchromic effect,  $T_m$ -values and their significance. Reassociation kinetics, cot curves and their significance. Types of RNA and DNA .

Prophyrins: Structure, properties and functions of heme, chlorophylls and cytochromes.

## Unit-IV : Enzymes

35 hours

Introduction to biocatalysis, differences between chemical and biological catalysis. Nomenclature and classification of enzymes. Enzyme specificity. Active site. Principles of energy of activation, transition state. Interaction between enzyme and substrate- lock and key, induced fit models. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor. Fundamentals of enzyme assay, enzyme units.

Factors affecting the catalysis- substrate concentration, pH, temperature. Michaelis - Menten equation for uni-substrate reaction (derivation not necessary), significance of  $K_M$  and  $V_{max}$ . Enzyme inhibition- irreversible and reversible, types of reversible inhibitions- competitive and non-competitive.

Outline of mechanism of enzyme action- acid-base catalysis, covalent catalysis, electrostatic catalysis, and metal ion catalysis. Regulation of enzyme activity- allosterism and cooperativity, ATCase as an allosteric enzyme, covalent modulation- covalent phosphorylation of phosphorylase, zymogen activation- activation of trypsinogen and chymotrypsinogen. Isoenzymes (LDH). Multienzyme complexes (PDH). Ribozyme.

### Practical – I

Max. Marks: 50

#### Qualitative Analysis and Enzymology

Introduction to Good Laboratory Practice (GLP). Principles of Laboratory Hygiene and Safety.

#### **List of experiments:**

1. Preparation of buffers (acidic, neutral and alkaline) and determination of pH.
2. Qualitative identification of carbohydrates- glucose, fructose, ribose/xylose, maltose, sucrose, lactose, starch/glycogen.
3. Qualitative identification of amino acids – histidine, tyrosine, tryptophan, cysteine, arginine.
4. Qualitative identification of lipids- solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.
5. Preparation of Osazones and their identification.
6. Absorption maxima of colored substances- *p*-Nitrophenol, Methyl orange.
7. Absorption spectra of protein-BSA, nucleic acids- Calf thymus DNA.
8. Titration curve of glycine and determination of *pK* and *pI* values.
9. Assay of amylase
10. Assay of urease
11. Assay of catalase.
12. Assay of phosphatase
13. Determination of optimum temperature for amylase.
14. Determination of optimum pH for phosphatase.

## **Recommended Books for Biochemistry**

### **General Biochemistry**

1. Lehninger's Principles of Biochemistry – Nelson.D.L. and Cox.M.M., Freeman & Co.
2. Biochemistry – Berg.J.M., Tymoczko.J.L. and Stryer.L., Freeman & Co.
3. Biochemistry – Voet.D and Voet., J.G., John Wiley & Sons .
4. Textbook of Biochemistry – West.E.S.,Todd.W.R,Mason.H.S..and. Bruggen, J.T.V., Oxford & IBH Publishers.
5. Principles of Biochemistry: General Aspects-Smith, E. L., Hill, R.L. Lehman, I. R. Lefkowitz, R.J. Handler, P., and White, A. McGraw-Hill
6. Outlines of Biochemistry – Conn.E.E.,Stumpf.P.K., Bruening, G and Doi.R.H., John Wiley & Sons .
7. Harper's Illustrated Biochemistry – Murray, R.K., Granner.D.K. & Rodwell,V.W., McGraw-Hill
8. Biochemistry-Lippincott's Illustrated Reviews. Champe, P.C. and Harvey, R. A. Lippincott
9. Fundamentals of Biochemistry –Jain, J.L., Jain, S., Jain, N. S. Chand & Co.
10. Biochemistry – Satyanarayana. U and Chakrapani. U, Books & Allied Pvt. Ltd.
11. Biochemistry – Rama Rao. A and Ratna Kumari. D, Kalyani Publishers.
12. Biochemistry- The Molecular Basis of Life – McKee. T and McKee, J. R, McGraw-Hill.

### **Enzymology**

1. Fundamentals of Enzymology – Price.N.C.and Stevens.L., Oxford University Press.
2. Understanding Enzymes – Palmer.T., Ellis Harwood.
3. Enzymes – Biochemistry, Biotechnology, Clinical Chemistry – Palmer.T., Affiliated East-West Press

# First Year BIOTECHNOLOGY Syllabus

## Paper – I (Part – II)

Max. Marks: 100

### CELL BIOLOGY AND GENETICS

<b>Unit I</b>	<b>Cell Structure, Function and Cell Division</b>	<b>30 hours</b>
1.1	Cells as basic units of living organisms Viral, bacterial, fungal, plant and animal cells	
1.2	Ultra structure of prokaryotic cell (Cell membrane, plasmids)	
1.3	Ultra structure of eukaryotic cell (Cell wall, cell membrane, mitochondria, chloroplast, endoplasmic reticulum, Golgi apparatus, vacuoles).	
1.4	Chromosome organization in Prokaryotes and Eukaryotes	
1.5	Structure of specialized chromosomes (Polytene and Lamp Brush)	
1.6	Cell Division and Cell Cycle	
1.7	Significance of mitosis and meiosis	
<b>Unit II</b>	<b>Mendel's Laws and Mechanism of Inheritance</b>	<b>30 hours</b>
2.1	Mendel's experiments – Factors contributing to success of Mendel's experiments	
2.2	Law of segregation – Monohybrid ratio	
2.3	Law of Independent assortment – Dihybrids, Trihybrids	
2.4	Deviation from Mendel's Laws - partial or incomplete dominance, co-dominance	
2.5	Penetrance and expressivity, pleiotropism	
2.6	Epistatic gene interaction – Modified dihybrid ratios (12:3:1; 9:7; 15:1; 9:3:4:, 9:6:1; 13:3)	
2.7	Genes and environment – phenocopies	
2.8	Linkage and recombination – Discovery of linkage, cytological proof of crossing over Recombination frequency and map distance Interference and coincidence Mitotic crossing over in <i>Drosophila</i>	
2.9	Mechanism of sex determination-genic balance theory - <i>Drosophila</i> Homogametic and Heterogametic theory (Human, Mammalian, Birds)	
2.10	X – linked inheritance (eg. Haemophilia)	
<b>Unit III</b>	<b>Structure and Function of Nucleic Acids</b>	<b>30 hours</b>
3.1	DNA as the genetic material – Griffiths experiments on transformation in <i>Streptococcus pneumoniae</i> . Avery, McEleod and Mc Carty's experiments. Hershey – Chase experiments with radio-labelled T <sub>2</sub> bacteriophage	
3.2	RNA as genetic material – Tobacco Mosaic Virus	
3.3	Structure of DNA – Watson and Crick Model Forms of DNA – A, B and Z forms of DNA, Super coiled and related DNA – Role of topoisomerases	

- 3.4 DNA Replication – Models of DNA replication (Semi-conservative, non-conservative models)  
Mechanisms of DNA replication – Linear and circular – Rolling circle and theta mechanism of replication
- 3.6. DNA damage and Repair

**Unit IV Concepts of Biostatistics and Bioinformatics 30 hours**

- 4.1 Concept of probability, basic laws and its application to Mendelian segregation. Concept of probability distribution. Binomial and Poisson distributions, Normal distribution and their application to biology
- 4.2 Concept of sampling and sampling distribution. Concept of test of hypothesis. Applications of t-test statistics to biological problems/data: Chi-square, statistic applications in biology
- 4.3 Simple Regression and Correlation. Concept of analysis of variance (one-way classification).
- 4.4 Introduction to Bioinformatics  
Biological Databases – Nucleotide sequence and Protein databases, their utilization in Biotechnology,  
Storage of biological data in databanks, data retrieval from databases and their utilization

**Practical – I**

**CELL BIOLOGY AND GENETICS**

**Max. Marks: 50**

**90 hrs**

**(3 hrs/week)**

**PRACTICALS**

1. Monohybrid and dihybrid ratio in *Drosophila*/maize
2. Estimation of DNA by diphenylamine method
3. Estimation of RNA by orcinol method
4. Preparation of different stages of Mitosis and Meiosis
5. Types of chromosomes
6. Finding statistical significance of a given data using ‘t’ test
7. Graphical representation of data (Histograms, frequency polygen, Pie diagram)
8. Fitting of binomial and Poisson distributions
9. Acquaintance with the Biological databases through Internet

**Recommended Books**

1. Biometry - By Sokal and Rohlf W.H. Freeman
2. Fundamentals of Biometry - By L.N. Balaram (George Allen and Unwin Ltd, London (1972)
3. Biostatistics - By N.T.J. Bailey
4. Biostatistics- Manual of biostatistical methods for use in health, nutrition and Anthropology - By K. Visweshwar Rao (Jaypee Publications).
5. Genetics - By Gardner (Macmillan Press)
6. An introduction to Genetic Analysis - By Griffith and others – Freeman and Company
7. Bioinformatics and Bioprogramming in C - By L.N. Chavali
8. Cell Biology - By S.C. Rastogi (New Age International (P) Ltd)

9. Statistical Genetics – Principles and Practice - By Prem Narain
10. Biotechnology - By K. Trehan
11. Biotechnology –1 - By R.S. Setty and G.R. Veena
12. Biotechnology – II - By R.S. Setty and V. Sreekrishna
13. Fundamentals of Genetics – By B.D. Singh, N. Pratibha, P.H. Rao and P.B. Kavi Kishor
14. Genetics - By B.D. Singh
15. Genetics - By Mohan P. Arora, Gurdarshan and S. Sandhu
16. Introduction to Bioinformatics - By V. Kothekar
17. An Introduction to Kothekar - By V. Kothekar and T. Nandi
18. Introduction to Bioinformatics - By Arthur M. Lesk
19. Cell and Molecular Biology - By De Robertis
20. Cell and Molecular Biology - By Lodish
21. Cell Biology and Genetics - By P.K. Gupta
22. Theory and Problems in Genetics - By Stransfield
23. Introduction to Bioinformatics - By T.K. Attwood, D.J. Parry-Smith, Samiron Phukan (Pearson Education)
24. Introduction to Biotechnology - By W.J. Thieman and M.A. Palladino (Pearson Education)
25. Discovering Genomics, Proteomics and Bioinformatics- By A.M. Campbell and L.J. Heyer (Pearson Education)
26. The World of the Cell - By Becker (Pearson Education)
27. Concepts of Genetics - By Klug (Pearson Education)
28. Genetics - By Strickberger (Pearson Education)
29. Fundamental Concepts of Bioinformatics - By Krane (Pearson Education)
30. Fundamentals of Biostatistics - By Khan and Khanum (Ukaaz Publications)
31. Basic Concepts of Bioinformatics - By Irfan Ali Khan and Atiya Khanum (Ukaaz Publications)

# First Year CHEMISTRY Syllabus

## Paper I (Part – II)

Max. Marks: 100  
120 hrs (4 h / w)

### Unit – I : Inorganic Chemistry – I

30 hrs (1h / w)

#### 1. p-block elements:

22 h

Group – 13: Synthesis and structure of diborane and higher boranes ( $B_4H_{10}$  and  $B_5H_9$ ), boron-nitrogen compounds ( $B_3N_3H_6$  and BN)

Group – 14: Preparation and applications of silanes and silicones, graphitic compounds.

Group – 15: Preparation and reactions of hydrazine, hydroxylamine, phosphazenes.

Group – 16: Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content.

Group – 17: Inter halogen compounds and pseudo halogens

#### 2. Organometallic Chemistry

8 h

Definition and classification of organometallic compounds, nomenclature, preparation, properties and applications of alkyls of 1, 2 and 13 group elements.

### UNIT-II (Organic Chemistry-I)

30hrs (1h /w)

#### 1. Structural theory in Organic Chemistry

12 h

Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like  $H_2O$ ,  $NH_3$  &  $AlCl_3$ ).

**Bond polarization** : Factors influencing the polarization of covalent bonds, electro negativity – inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions, carbenes and nitrenes.

Types of Organic reactions : Addition – electrophilic, nucleophilic and free radical. Substitution – electrophilic, nucleophilic and free radical. Elimination- Examples (with mechanisms).

#### 2. Alicyclic hydrocarbons (Cycloalkanes)

6 h

Nomenclature, Preparation by Freund's methods, heating dicarboxylic metal salts. Properties – reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes – Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.

#### 3. Benzene and its reactivity

8 h

Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene.

Concept of aromaticity – aromaticity (definition), Huckel’s rule – application to Benzenoid (Benzene, Napthalene) and Non – Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation)

Reactions – General mechanism of electrophilic substitution, mechanism of nitration. Friedel Craft’s alkylation and acylation. Orientation of aromatic substitution – Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO<sub>2</sub> and Phenolic). Orientation effect of (i). Amino, methoxy and methyl groups (ii). Carboxy, nitro, nitrile, carbonyl and Sulfonic acid groups. (iii). Hologens (Explanation by taking minimum of one example from each type).

**4. Polynuclear Hydrocarbons – 4 h**

Structure of naphthalene and anthracene (Molecular Orbital diagram and resonance energy) Any two methods of preparation of naphthalene and reactivity. Reactivity towards electrophilic substitution. Nitration and sulfonation as examples.

**Unit-III – (Physical Chemistry – I)**

**30h (1h/w)**

**1 Liquid state 6 h**

Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.

**2 Solid state 12 h**

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. Bravis lattices and crystal systems. X-ray diffraction and crystal structure. Bragg’s law. Determination of crystal structure by Bragg’s method and the powder method. Indexing of planes and structure of NaCl and KCl crystals.

Defects in crystals. Stoichiometric and non-stoichiometric defects. Band theory of semoconductors. Extrinsic and intrinsic semiconductors, n- and p-type semiconductors and their applications in photo electrochemical cells.

**3 Solutions 12 h**

Liquid-liquid - ideal solutions, Raoult’s law. Ideally dilute solutions, Henry’s law. Non-ideal solutions. Vapour pressure – composition and vapour pressure-temperature curves. Azeotropes-HCl-H<sub>2</sub>O, ethanol-water systems and fractional distillation. Partially miscible liquids-phenol-water, trimethylamine-water, nicotine-water systems. Effect of impurity on consulate temperature. Immiscible liquids and steam distillation.

Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

**UNIT – IV (General Chemistry-I)**

**30 h (1h / w)**

**1. Atomic Structure and elementary quantum mechanics 8 h**

Blackbody radiation, Planck’s radiation law, photoelectric effect, Compton effect, de Broglie’s hypothesis, Heisenberg’s uncertainty principle. Postulates of quantum mechanics. Schrodinger wave equation and a particle in a box, energy levels, wave functions and probability densities. Schrodinger wave equation for H-atom. Separation of variables, Radial and angular functions, hydrogen like wave functions, quantum numbers and their importance.

**2. Chemical Bonding****8 h**

Valence bond theory, hybridization, VB theory as applied to  $\text{ClF}_3$ ,  $\text{BrF}_5$ ,  $\text{Ni}(\text{CO})_4$ ,  $\text{XeF}_2$ . Dipole moment – orientation of dipoles in an electric field, dipole moment, induced dipole moment, dipole moment and structure of molecules. Molecular orbital theory – LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules ( $\text{N}_2$ ,  $\text{O}_2$ ,  $\text{HCl}$ ,  $\text{CO}$  and  $\text{NO}$ ). Comparison of VB and MO theories.

**3. Stereochemistry of carbon compounds****10 h**

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. Stereoisomerism, Stereoisomers: enantiomers, diastereomers- definition and examples. Conformational and configurational isomerism- definition. Conformational isomerism of ethane and n-butane.

Enantiomers: Optical activity- wave nature of light, plane polarised light, interaction with molecules, optical rotation and specific rotation. Chiral molecules- definition and criteria- absence of plane, center, and  $S_n$  axis of symmetry- asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and dissymmetric molecules (trans -1,2-dichloro cyclopropane).

Chiral centers: definition- molecules with similar chiral carbon (Tartaric acid), definition of mesomers- molecules with dissimilar chiral carbons (2,3-dibromopentane). Number of enantiomers and mesomers- calculation.

D,L and R,S configuration for asymmetric and dissymmetric molecules. Cahn-Ingold-Prelog rules. Racemic mixture- racemisation and resolution techniques.

Diastereomers: definition- geometrical isomerism with reference to alkenes- cis, trans and E,Z- configuration.

**4. Asymmetric (Chiral) synthesis****4 hrs**

Definitions- Asymmetric synthesis, enantiomeric excess, diastereomeric excess, Stereospecific reaction, definition, example dehalogenation of 1,2 – dibromides by I. stereoselective reaction, definition, example, acid catalysed dehydration of I-phenylpropanol.

**5. General Principles of Inorganic qualitative analysis****4 hrs**

Solubility product, common ion effect, characteristic reactions of anions, elimination of interfering anions, separation of cations into groups, group reagents, testing of cations

**Practical – I**  
**INORGANIC CHEMISTRY**

**Max. Marks: 50**  
**90 hrs (3 h / w)**

**Qualitative Analysis and Inorganic preparations:**

Analysis of mixtures containing two anions (one simple and one interfering) and two cations (of different groups) from the following:

Anions: Carbonate, sulfide, sulphate, chloride, bromide, iodide, acetate, nitrate, oxalate, tartrate, borate, phosphate, arsenate\* and chromate\*.

Cations: Lead, copper, bismuth, cadmium, tin, antimony, iron, aluminum, zinc, manganese, nickel, cobalt, calcium, strontium, barium, potassium and ammonium.

Preparations: Any three of the following inorganic preparations:

- 1) Ferrous ammonium sulphate
- 2) Tetrammine copper (II) sulphate
- 3) Potassium trisoxalato chromate
- 4) Potash alum  $KAl(SO_4)_2 \cdot 12H_2O$
- 5) Hexammine cobalt (III) chloride.

## Recommended Text Books and Reference Books

### Inorganic Chemistry

1. Concise Inorganic Chemistry by J.D.Lee
2. Basic Inorganic Chemistry by Cotton and Wilkinson
3. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
4. Inorganic Chemistry by R R Heslop and P.L. Robinson
5. Modern Inorganic Chemistry by C F Bell and K A K Lott
6. University Chemistry by Bruce Mahan
7. Qualitative Inorganic analysis by A.I.Vogel
8. A textbook of qualitative inorganic analysis by A.I. Vogel
9. Inorganic Chemistry by J.E.Huheey
10. Inorganic Chemistry by Chopra and Kapoor
11. Coordination Chemistry by Basalo and Johnson
12. Organometallic Chemistry – An introduction by R.C.Mehrotra and A.Singh
13. Inorganic Chemistry by D.F.Shriver, P.W.Atkins and C.H.Langford
14. Inorganic Chemistry by Philips and Williams, Lab Manuals
15. Introduction to inorganic reactions mechanisms by A.C.Lockhart
16. Theoretical inorganic chemistry by McDay and J.Selbin
17. Chemical bonding and molecular geometry by R.J.Gillepsy and P.L.Popelier
18. Advanced Inorganic Chemistry By Gurudeep Raj
19. Analytical chemistry by Gary D Christian, Wiley India
20. Analytical Chemistry by G.L.David Krupadanam, et al, Univ. Press
21. Selected topics in inorganic chemistry by W.D.Malik, G..D.Tuli, R.D.Madan
22. Concepts and models of Inorganic Chemistry by Bodie Douglas, D.McDaniel and J.Alexander
23. Modern Inorganic Chemistry by William L. Jolly
24. Concise coordination chemistry by Gopalan and Ramalingam
25. Satyaprakash's modern inorganic chemistry by R.D.Madan.

### Organic Chemistry

1. Organic Chemistry By R T Morrison and R.N.Boyd
2. Organic Chemistry by T.J.Solomons
3. Organic Chemistry by L.G.Wade Sr
4. Organic Chemistry by D.Cram, G.S.Hammond and Herdricks
5. Modern Organic Chemistry by J.D.Roberts and M.C.Caserio
6. Text book of Organic Chemistry by Ferguson
7. Problems and their solutions in organic Chemistry by I.L.Finar
8. Reaction mechanisms in Organic Chemistry by S.M.Mukherji and S.P.Singh
9. A guide book to mechanisms in Organic Chemistry by Peter Sykes
10. Organic spectroscopy by J.R.Dyer
11. Organic Spectroscopy by William Kemp
12. Fundamentals of organic synthesis amd retrosynthetic analysis by Ratna Kumar Kar
13. Comprehensive practical organic qualitative analysis by V.K.Ahluwalia & Sumta Dhingra
14. Comprehensive practical organic chemistry: Preparation and quantitative analysis by V.K.Ahluwalia and Reena Agarwal.

15. Organic Chemistry by Janice Gorzynski
16. Organic Chemistry by Stanley H Pine
17. Fundamentals of Organic Chemistry by John Mc Murray, Eric Simanek
18. Organic Chemistry by Francis A Carey
19. Text book of Organic Chemistry by K.S.Mukherjee
20. Organic Chemistry by Bhupinder Meha & Manju Mehta
21. Organic Chemistry by L.G.Wade Jr, Maya Shankar Singh
22. Elementary organic spectroscopy by Y.R. Sharma
23. Chemistry & Industry by Gurdeep R. Chatwal
24. Applied Chemistry by Jayashree Ghosh
25. Drugs by David Krupadanam
26. Pharmacodynamics by R.C.Srivastava, Subit Ghosh
27. Analytical Chemistry by David Krupadanam
28. Green Chemistry – V.K.Ahluwalia
29. Organic Synthesis by V.K.Ahluwalia and R.Agarwal
30. New trends in Green Chemistry –by V.K.Ahluwalia & M.Kidwai
31. Industrial Chemistry by B.K.Sharma
32. Industrial Chemistry by Banerji
33. Industrial Chemistry by M.G.Arora
34. Industrial Chemistry by O.P.Veramani & A.K.Narula
35. Synthetic Drugs by O.D.Tyagi & M.Yadav
36. Medicinal Chemistry by Ashutoshkar
37. Medicinal Chemistry by P.Parimoo
38. Pharmacology & Pharmacotherapeutics by R.S Satoshkar & S.D.Bhandenkar
39. Medicinal Chemistry by Kadametal P-I & P.II
40. European Pharmacopoeia
41. Vogel's Qualitative organic analysis.
42. Laboratory manual of Organic Chemistry by Raj K Bansal

#### **Physical chemistry books.**

1. Physical chemistry A molecular approach by Donald A. Mcquarrie and John D. Simon.
2. Physical chemistry by G M Barrow
3. Principles of physical chemistry by Prutton and Marron
4. Physical chemistry by Peter Atkins, Julio D. Paula
5. Physical Chemistry by Ira N Levine
6. Elements of Physical Chemistry by Peter Atkins, Julio D. Paula
7. Text book of Physical Chemistry by P.L.Soni, O.P.Dharmarha and Q.N.Dash
8. Solid State Chemistry and its applications by Anthony R. West
9. Text book of physical chemistry by K L Kapoor
10. Thermodynamics for Chemists by S Glasston
11. Chemical Kinetics by K J Laidler
12. An Introduction to Electrochemistry by S Glasston
13. Physical chemistry through problems By S K Dogra
14. Thermodynamics by J Jayaram and J C Kuriakose
15. Introductory Quantum Chemistry by A K Chandra
16. Physical Chemistry by J W Moore

17. Kinetics and mechanism by J W Moore and R G Pearson
18. Fundamentals of photochemistry by K K Rohtagi Mukharjee
19. Chemical thermodynamics by R P Rastogi and S S Misra
20. Advanced physical chemistry by Gurudeep Raj
21. Physical chemistry by G W castellan
22. Physical chemistry by Silbey, Alberty and Bawendi.
23. Elements of physical chemistry by Glasstone and Lewis
24. Text book of physical chemistry by S Glasstone
25. Fundamentals of Molecular spectroscopy by C.N.Banwell and E.M.McCash
26. Nanochemistry by Geoffrey Ozin and Andre Arsenault
27. Catalysis: Concepts and green applications by Gadi Rotherberg
28. Green Chemistry: Theory and practice by P.T.Anastas and J.C.Warner
29. Polymer Science by Gowriker, Viswanathan and Jayadev Sridhar
30. Introduction polymer Chemistry By G.S.Misra
31. Polymer Chemistry by Bilmayer
32. Kinetics and Mechanism of Chemical Transformations by Rajaram and Kuriacose.
33. Senior practical physical chemistry by Khosla

# First Year Computer Science Syllabus

## Paper-1 (Part – II)

Max. Marks: 100  
120 hrs

### *PC Software and 'C' Programming*

#### **Unit – 1 : Fundamentals of Computers**

**24 hrs**

Computer definition - Types of Computer - Logical Organization of a Digital Computer - Memory : Main Memory : RAM, ROM and Cache - Secondary Memory : Magnetic type, Floppy disk, Hard disk, Compact disk - Input devices - Output devices - Operating system : Definition, functions of an operating system, Types of Operating systems : Brief details of batch processing, Multi Programming, multi tasking, time sharing, real time operating systems - Introduction to DOS, DOS internal commands, DOS External Commands - Introduction to Windows, Desktop, File, Folder, My Computer, My documents, Recycle bin, Internet Explorer, Windows Explorer - Types of Programming Languages.

#### **Unit - 2: MS Word and MS Power Point**

**24 hrs**

**Word Basics** : Starting word, Creating a new document, Opening preexisting document, The parts of a word window, Typing text, Selecting text, Deleting text, Undo, Redo, Repeat, Inserting text, Replacing text, Formatting text, Cut, Copy, Paste - Printing.

Formatting Your Text and Documents : Auto format, Line spacing, Margins, Borders and Shading.

**Working with Headers and Footers:** Definition of headers and footers, creating basic headers and footers, creating different headers and footers for odd and even pages.

**Tables** : Creating a simple table, Creating a table using the table menu, Entering and editing text in a table, selecting in table, adding rows, changing row heights, Deleting rows, Inserting columns, Deleting columns, changing column width .

**Graphics** : Importing graphics, Clipart, Insert picture, Clip Art Gallery, using word's drawing features, drawing objects, text in drawing.

**Templates** : Template types, using templates, exploring templates, modifying templates.

**Macros** : Macro, Recording macros, editing macros, running a macro.

**Mail Merge** : Mail Merge concept, Main document, data sources, merging data source and main document. Overview of word menu options word basic tool bar.

**Power Point** : Basics, Terminology, Getting started, Views

**Creating Presentations** : Using auto content wizard, Using blank presentation option, Using design template option, Adding slides, Deleting a slide, Importing Images from the outside world, Drawing in power point, Transition and build effects, Deleting a slide, Numbering a slide, Saving presentation, Closing presentation, Printing presentation elements.

**Unit - 3 : MS Excl and MS Access 24 hrs**

Creating a Simple Database and Tables: Creating a contacts Databases with the wiz, The

Access Table Wizard, Creating Database Tables without the wizard, Field Names, Data

Types and Properties, Adding, deleting fields, renaming the fields in a table.

**Forms:** The Form Wizard, Saving Forms, Modifying Forms

**Entering and Editing Data:** Adding Records, Duplicating previous entries without Retyping, Undo, Correcting Entries, Global Replacements, Moving from Record to Record in a table.

**Finding, Sorting and Displaying Data:** Queries and Dynasets, Creating and using select queries, Returning to the Query Design, Multilevel Sorts, Finding incomplete matches, Showing All Records after a Query, Saving Queries, Crosstab Queries.

**Printing Reports** : Simple table, Form and Database printing, Defining advanced Reports, Manual Reporting, properties in Reports, Saving Reports.

**Relational Databases:** Flat Versus Relational, Types of Relationships, Viewing Relationships, Defining and Redefining Relationships, Creating and Deleting Relationships.

### **MS Excel**

**Excel Basics:** Overview of Excel features, Getting started, Creating a new worksheet, Selecting cells, Entering and editing text, Entering and editing Numbers, entering and editing Formulas, Referencing cells, moving cells, copying cells, sorting cell data, inserting rows, inserting columns, Inserting cells, Deleting parts of a worksheet, clearing parts of a worksheet.

**Formatting** : Page setup, changing column widths and Row heights, auto format, changing font sizes and Attributes, centering text across columns, using border buttons and Commands, changing colors and shading, hiding rows and columns.

**Introduction to functions:** Parts of a functions, Functions Requiring Add-ins, The Function Wizard. Examples functions by category: Data and time functions, Engineering functions, Math and Trig functions, Statistical functions, Text functions.

**Excel Charts:** Chart parts and terminology, Instant charts with the chart wizard, creation of different types of charts, printing charts, deleting charts - Linking in Excel

**Excel Graphics :** Creating and placing graphic objects, Resizing Graphics, Drawing Lines and Shapes.

#### **Unit - 4 : C Language fundamentals**

**24 hrs**

**Introduction - 'C' Fundamentals :** Programming - High Level Languages - compiling programs - Integrated Development Environments - Language Interpreters - Compiling your first program - Running your program - understanding your first program - comments - variables, Data types, and Arithmetic Expressions : working with variables - Understanding Data types and constants - working with Arithmetic Expressions - The Assignment operators - The print function - The scan function - Decision making : The if statement - the if else construct - Nested if statements - The else if construct - The switch statement - Boolean variables - The conditional operator - program looping : The for statement - Relational operators - Nested for loops - The while statement - The do statement - The break statement - The continue statement - working with Arrays : Defining an array - Initializing Arrays - character Arrays - The const Qualifier - Multidimensional arrays- variable length Arrays.

**Working with Functions :** Defining a Function-Arguments and Local variables - Returning Function Results - Function calling - Declaring Return Types and Argument types - Top Down programming - Functions and Arrays - global variables - Automatic and static variables - Recursive Functions.

#### **Unit - 5 : Programming in C**

**24 hrs**

**Working with structures :** Defining structure - Functions and structures - Initializing structures - Array of structures- structures containing structures - structures containing Arrays - Structure variants - Character strings : Array of characters - variable length character strings - Escape characters - character strings, structures and arrays - character operations.

**Pointers :** Defining a pointer variable - using pointers in Expressions - pointers and structures (Exclude Linked List) - Pointers and Functions - pointers and Arrays - operations on pointers - pointers and Memory address.

**Operations on Bits :** Bit operators - Bit fields

**The preprocessor :** The # define statement - The # # operator - The #include statement - conditional compilation.

**More on Data Types :** Enumerated Data Types - The typedef statement - Data Type conversions

**Input and Output Operations in "C" :** Character I/O - formatted I/O - Input and Output Operations with Files - Special functions for working with Files.

**Miscellaneous and Advanced features:** The Goto Statement, the null statement, working with unions- the comma operator-type qualifiers.

**Prescribed Books :**

- 1. Peter Norton, Introduction to Computers, Sixth edition, Tata McGraw Hill(2007).**
- 2. Ron Mansfield, Working in Microsoft Office, Tata McGraw Hill (2008) (Chapters : 4 to 9, 11, 12, 13, 14, 15, 17, 18, 19, 24, 25,28, 30, 31, 33, 34, 35)**
- 3. Stephen G. Kochan, Programming in C, Third Edition, Pearson Education (2007) (Chapters: 1 to 14, 16, 17)**

**Reference Books :**

1. Michael Miller, Absolute Beginners Guide to Computer Basics, Fourth Edition, Pearson Education (2007).
2. Deborah Morley, Charles S.Parker, Under Standing Computers today and tomorrow, 11<sup>th</sup> Edition, Thomson (2007).
3. Ed Bott, Woody Leonhard, Using Microsoft Office 2007, Pearson Education (2007).
4. Beyron S Gottfried, Programming with C, Second Edition, Tata McGraw Hill (2007).
5. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson Education (2008).
6. Rajaraman, Introduction to Information Technology, PHI.
7. Balaguruswamy.E, Fundamentals of Computing, TMH(2008).

## Practical – I

**Max. Marks: 50**  
**(40+10)**  
**90 Hrs**  
**(3 hrs per week)**

### Productivity Tools and ‘C’ Lab

#### Productivity Tools Lab Cycle

##### MS-WORD

1. Design a visiting card for Managing Director of a Company with following specification
  - i. Size of visiting card is 3.5” x 2”
  - ii. Name of a company with big font using Water Mark
  - iii. Phone number, fax number and e-mail address with appropriate symbols
  - iv. Office and residence address separated by line.
2. Create a letter head of a company
  - i. Name of Company on the top of the page with big font and good style
  - ii. Phone numbers, fax numbers, e-mail address with appropriate symbols
  - iii. Main products manufactured to be described at the bottom
  - iv. Slogans if any should be specified in bold at the bottom
3. Creation of your Bio-Data: consisting Name, email-id, Contact Address, Carrier Objective, Educational qualifications, social activities, achievements.

##### MS-POWERPOINT

1. Make a Power point presentation on your strengths, weaknesses, hobbies, factors that waste your time.
2. Make a Power point presentation on any Current affair (Not less than 8 slides)
3. Make a Power point presentation to represent your College profile.
4. Make a Power point presentation of all the details of the books that you had studied in B.Sc. First Year.

##### MS-ACCESS

1. Create a database using MS-ACCESS with atleast 5 records  
TABLE1 STRUCTURE: REGISTER NUMBER NAME DOB GENDER CLASS

TABLE2 STRUCTURE: REGISTER NUMBER M1 M2 M3 M4 M5 TOTAL  
Maintain the relationship between two tables with REGISTER NUMBER as a Primary Key and answer the following queries:

Show the list of students with the following fields as one query

REGISTER NUMBER NAME GENDER TOTALMARKS

- Maintain the relationship between above two tables with REGISTER NUMBER as a Primary Key and answer the following reports:  
Reports must have following columns  
Report1 with REGISTER NUMBER, NAME, MARKS OF ALL SUBJECTS and TOTAL  
Report2 with REGISTER NUMBER, TOTAL , PERCENTAGE.
- Create a database using MS-ACCESS with at least 5 records  
TABLE1 STRUCTURE: EMP-CODE EMP-NAME AGE GENDER DOB  
TABLE2 STRUCTURE: EMP-CODE BASIC-PAY

Maintain the relationship between two tables with EMP-CODE as a Primary Key generate the following reports:

REPORT1: EMP-CODE EMP-NAME BASIC-PAY DA HRA GROSS-SALARY

REPORT2: EMP-CODE EMP-NAME AGE GENDER GROSS-SALARY

MS-EXCEL

- Create an electronic spreadsheet in which you enter the following decimal numbers and convert into Octal, Hexadecimal and Binary numbers Vice versa.  
Decimal Numbers: 35,68,95,165,225,355,375,465  
Binary Numbers: 101,1101,111011,10001,110011001,111011111.
- The ABC Company shows the sales of different products for 5 years. Create column chart, 3D-column and Bar chart for the following data

YEAR	PRODUCT-1	PRODUCT-2	PRODUCT-3	PRODUCT-4
2003	1000	800	900	1000
2004	800	80	500	900
2005	1200	190	400	800
2006	400	200	300	1000
2007	1800	400	400	1200

- Create a suitable examination data base and find the sum of the marks(total) of each student and respective class secured by the student rules:

Pass if marks in each subject  $\geq 35$   
Distinction if average  $\geq 75$   
First class if average  $\geq 60$  but  $< 75$   
Second class if average  $\geq 50$  but  $< 60$   
Third class if average  $\geq 35$  but  $< 50$   
Fail if marks in any subject is  $< 35$

Display average marks of the class, subject wise and pass percentage.

## *C-PROGRAMMING LAB CYCLE*

1. Program for
  - i. Sum of factors of a number
  - ii. Sum of digits of a number
2. Program to check whether a given number is
  - i. Prime number or not
  - ii. Perfect number or not
  - iii. Armstrong number or not
3. Program using recursion for
  - i. Factorial of a given number
  - ii. Fibonacci series
4. Program for roots of a quadratic equation
5. Program using functions
  - i. With out return value
  - ii. With return value
  - iii. With parameters
  - iv. With out parameters
6. Program to find largest/smallest of n numbers by using arrays
7. Program for sorting an array
8. Program for matrix addition & subtraction
9. Program for matrix multiplication
10. Program for transpose of a given matrix
11. Program for (with and without string functions)
  - i. Comparison of two strings
  - ii. Concatenation of two strings
  - iii. Length of a string
12. Program to process student information. Student structure consists Sno, Sname, Marks in 6 subjects, Total, average. Calculate total and average of n students and assign grade with following criteria.
  - Grade A : All pass and avg  $\geq 75$
  - Grade B: All pass and avg  $\geq 60$  and avg  $< 75$
  - Grade C: All pass and avg  $\geq 50$  and avg  $< 60$
  - Grade D: All pass and avg  $\geq 40$  and avg  $< 50$
  - Grade E: If fails in one or more subjects.
13. Program for (i) Nesting of Structure (ii) Passing structures to functions.
14. Program to demonstrate (i) Unions (ii) enumerated data types.
15. Program for sum of diagonal elements of a square matrix?
16. Program to access (i) array elements (ii) Structure elements using pointers.
17. Program for sorting strings using pointers.
18. Program to count number of (i) words (ii) lines (iii) Special Characters in a given text.
19. Program to create a file to store and retrieve strings using fputs() and fgets().
20. Program to create a file to store and update employee records. The employee record consists of ENO, ENAME, DEPTNO, DEPTNAME, BASICSALARY, HRA, DA, DEDUCTIONS, TOTALSALARY and NETSALARY.
21. Program to evaluate following expressions.
$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{n}$$
22. Program to find Square root of a given no.
23. Program to create table of Triangular Numbers.
24. Program for reversing digits of a no.
25. Program for Base Conversion.

**Model Question Paper**  
**B.Sc. (Computer Science): I Year: Theory Paper-1**  
**PC Software and C Programming**

Time: 3 Hrs

Max. Marks: 100

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SECTION - A

1. Answer ALL Questions : 10 x 2 = 20 M

- a) Define Macro.
- b) How to change font size and font style in MS Word.
- c) Difference between Structure and Union.
- d) Difference between Dos Internal and External commands.
- e) Advantage of linking in Excel.
- f) What is Qualifier?
- g) Explain any two bit-wise Operators.
- h) File modes in 'C'.
- i) Define Recycle Bin.
- j) What is C preprocessor ?

SECTION - B

Answer All Questions : 5 x 16 = 80 M

2. a. Give Block diagram of Computer and Explain its Units in detail.  
b. Explain functions of an operating system.  
(or)  
c. Explain RAM,ROM, Cache memories.  
d. Describe different types of Input devices.
3. a. Explain Mail merge concept in MS-Word.  
b. Explain Macros concept in MS-Word.  
(or)  
c. Describe steps to create a presentation using auto content wizard in Power Point.  
d. How to delete, insert, copy, print slides in Power Point.
4. a. Explain about Engineering and Math functions in MS-Excel.  
b. Explain about different types of Charts in MS-Excel.  
(or)  
c. What are the steps for creation of database in MS-Access.  
d. Explain Manual Reporting and properties of reports.
5. a. Describe with examples decision making and loop statements.  
b. Write program for Perfect Number.  
(or)  
c. With suitable example, explain recursive functions.  
d. Write a program to find roots of a Quadratic equation.
6. a. Explain pre-processor, # include, # define.  
b. Write a Program for string Palindrome.  
(or)  
c. Explain file management in 'C'.  
d. What is a pointer variable ? How it can be defined. What are the operations that we can perform on pointer variable ?  
Mention advantages of Pointers.

**First Year ELECTRONICS Syllabus**  
**PAPER-I (Part – II)**

**Max. Marks: 100**

**Circuit Analysis and Electronic Devices.**

(120 hours)

**UNIT-I** (30 hours)

**AC Fundamentals:** The Sine wave –Average and RMS values–The J operator – Polar and rectangular forms of complex numbers – Phasor diagram – Complex impedance and admittance.

**Passive networks:** Concept of voltage and current sources – KVL and KCL- Application to simple circuits (AC and DC) consisting of resistors and sources (one or two) - Node voltage analysis and method of mesh currents.

**Network theorems (DC and AC):** Superposition Theorem–Thevenin’s Theorem–Norton’s Theorem–Maximum power transfer Theorem–Millman Theorem-Reciprocity Theorem – Application to simple networks.

**UNIT- II** (30 hours)

**RC and RL Circuits:** Transient response of RL and RC circuits with step input– time constants. Frequency response of RC and RL circuits – Types of Filters: Low pass filter – High pass filter – Band pass – LC tank circuit – Application in communication – frequency response - Passive differentiating and integrating circuits.

**Resonance:** Series resonance and parallel resonance RLC circuits – Resonant frequency – Q factor – Band width – Selectivity.

**UNIT-III** (30 hours)

**PN Junction:** Depletion region – Junction capacitance – Diode equation (no derivation) – Effect of temperature on reverse saturation current – construction, working, V-I characteristics and simple applications of  
i) Junction diode ii) Zener diode iii) Tunnel diode and iv) Varactor diode.

**Bipolar Junction Transistor (BJT):** PNP and NPN transistors–current components in BJT – BJT static characteristics (Input and Output) – Early effect- CB, CC,CE configurations (cut off, active, and saturation regions) CE configuration as two port network – h-parameters – h-parameter equivalent circuit. Experimental arrangement to study input and output characteristics of BJT in CE configuration. Determination of h-parameters from the characteristics. Biasing and load line analysis – Fixed bias and self bias arrangement.

#### **UNIT-IV (30 hours)**

**Field Effect Transistor (FET):** Structure and working of JFET and MOSFET – output and transfer characteristics – Experimental arrangement for studying the characteristics and to determine FET parameters. Application of FET as voltage variable resistor and MOSFET as a switch – Advantages of FET over transistor.

**Uni Junction Transistor (UJT):** Structure and working of UJT- Characteristics. Application of UJT as a relaxation oscillator.

**Silicon Controlled Rectifier (SCR):** Structure and working of SCR. Two transistor representation, Characteristics of SCR. Experimental set up to study the SCR characteristics. Application of SCR for power control – Phase Angle control, Zero cross detection – Introduction to IGBT

**Photo Electric Devices:** Structure and operation of LDR, Photo voltaic cell, Photo diode, Photo transistors and LED.

**(NOTE: Solving related problems in all the Units)**

#### Reference Books:

1. Grob's Basic Electronics - Mitchel E.Schultz 10<sup>th</sup> Edn. Tata McGraw Hill (TMH)
2. Network lines and fields- Ryder- Prentice Hall of India (PHI)
3. Circuit analysis - P.Gnanasivam- Pearson Education
4. Circuits and Networks - A.Sudhaksr & Shyammohan S. Palli - TMH
5. Network Theory - Smarajit Ghosh - PHI
6. Electronic Devices and Circuits-Millman and Halkias - TMH
7. Electronic Devices and Circuits-Allen Mottershead - PHI
8. Principles of Electronics- V.K. Mehta and Rohit Mehta - S Chand &Co
9. Electronic Devices and Circuit Theory- R.L.Boylestad and L.Nashelsky- Pearson Education.
10. Pulse digital switching waveforms -Millman &Taub - TMH.
11. Applied Electronics- R.S.Sedha - S Chand &Co
12. A First course in Electronics- AA Khan & KK Day- PHI
13. Principles of Electronic circuits- Stanely G.Burns and Paul R. Bond- Galgotia.
14. Electronic Principles and Applications – A.B. Bhattacharya- New Central Book Agency Pvt.



## PRACTICALS -I

**Max. Marks - 50**  
(90 hours-30 Sessions)

### **Circuit Analysis and Electronic devices Lab**

1. Measurement of peak voltage, frequency and phase using CRO.
2. Thevenin's theorem – verification.
3. Norton's theorem – verification.
4. Maximum power transfer theorem – verification.
5. CR and LRCircuits- Frequency response- (Low pass and High pass).
6. CR and LR circuits - Differentiation and integration - tracing of waveforms.
7. LCR–Series resonance circuit–Frequency response–Determination of  $f_o$ , Q and band width.
8. To draw volt-ampere characteristics of Junction diode and determine the cut-in voltage, forward and reverse resistances.
9. Zener diode V-I Characteristics– Determination of Zener breakdown voltage.
10. Voltage regulator using Zener diode
11. BJT input and output characteristics (CE configuration) and determination of 'h' parameters.
12. FET –Characteristics and determination of FET parameters.
13. UJT as relaxation oscillator.
14. LDR- characteristics.
15. SCR Volt-ampere characteristics.
16. Response of LDR, Photo Diode and Photo transistor to different wavelengths of light. Determination of peak sensitivity.

***Note: Student has to perform any 12 experiments.***



# Model question paper (theory)

Time : 3 hrs

Max.Marks : 100

## Part A

(Two questions are to be set from each Unit)

Answer all questions

Each question carries 5 marks

8X5= 40

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

## Part B

(Two questions are to be set from each Unit)

Answer any four questions

Each question carries 15 marks

4X15= 60

9. a) }  
or } to be set from Unit 1  
b) }
10. a) }  
or } to be set from Unit 2  
b) }
11. a) }  
or } to be set from Unit 3  
b) }
12. a) }  
or } to be set from Unit 4  
b) }

# First Year MATHEMATICS Syllabus

## Paper – I (Part – II)

Max. Marks - 100

### DIFFERENTIAL EQUATIONS & SOLID GEOMETRY

120 hrs  
(4 hrs/week)

#### DIFFERENTIAL EQUATIONS

**UNIT - I:** (25 hours)

##### **Differential equations of first order and first degree**

Linear differential equations; Differential equations reducible to linear form; Exact differential equations; Integrating factors; Change of variables; Simultaneous differential equations; Orthogonal trajectories.

##### **Differential equations of the first order but not of the first degree:**

Equations solvable for  $p$ ; Equations solvable for  $y$ ; Equations solvable for  $x$ ; Equations that do not contain  $x$  (or  $y$ ); Equations of the first degree in  $x$  and  $y$  - Clairaut's equation.

**UNIT - II:** (35 hours)

##### **Higher order linear differential equations**

Solution of homogeneous linear differential equations of order  $n$  with constant coefficients. Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators. Method of variation of parameters; Linear differential equations with non-constant coefficients; The Cauchy-Euler equation

##### **System of linear differential equations:**

Solution of a system of linear equations with constant coefficients; An equivalent triangular system. Degenerate Case:  $p_1(D) p_4(D) - p_2(D) p_3(D) = 0$ .

**Prescribed Text book:** Scope and treatment as in Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall of India Pvt. Ltd. New Delhi-Second edition: Sections: - 2.5 to 2.9, 3.1, 3.2, 4.2, 5.2 to 5.7, 7.3, 7.4.

**Reference Book:** Rai Singhania, "Ordinary and Partial Differential Equations", S.Chand & Company, New Delhi

#### SOLID GEOMETRY

**UNIT - III:** (35 hours)

##### **The Plane**

Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes, Combined equation of two planes, Orthogonal projection on a plane.

### **The Line:**

Equations of a line, Angle between a line and a plane, The condition that a given line may lie in a given plane, The condition that two given lines are coplanar, Number of arbitrary constants in the equations of a straight line. Sets of conditions which determine a line, The shortest distance between two lines. The length and equations of the line of shortest distance between two straight lines, Length of the perpendicular from a given point to a given line,

### **The Sphere:**

Definition and equation of the sphere, Equation of the sphere through four given points, Plane sections of a sphere. Intersection of two spheres; Equation of a circle. Sphere through a given circle; Intersection of a sphere and a line. Power of a point; Tangent plane. Plane of contact. Polar plane, Pole of a plane, Conjugate points, Conjugate planes; Angle of intersection of two spheres. Conditions for two spheres to be orthogonal; Radical plane. Coaxial system of spheres; Simplified form of the equation of two spheres.

**UNIT - IV:** (25 hours)

### **Cones, Cylinders and conicoids:**

Definitions of a cone, vertex, guiding curve, generators. Equation of the cone with a given vertex and guiding curve. Enveloping cone of a sphere. Equations of cones with vertex at origin are homogenous. Condition that the general equation of the second degree should represent a cone. Condition that a cone may have three mutually perpendicular generators. Intersection of a line and a quadric cone. Tangent lines and tangent plane at a point. Condition that a plane may touch a cone. Reciprocal cones. Intersection of two cones with a common vertex. Right circular cone. Equation of the right circular cone with a given vertex, axis and semi-vertical angle.

Definition of a cylinder. Equation to the cylinder whose generators intersect a given conic and are parallel to a given line, Enveloping cylinder of a sphere. The right circular cylinder. Equation of the right circular cylinder with a given axis and radius.

The general equation of the second degree and the various surfaces represented by it; Shapes of some surfaces. Nature of Ellipsoid. Nature of Hyperboloid of one sheet.

**Prescribed Text book:** Scope as in *Analytical Solid Geometry* by Shanti Narayan and P.K. Mittal, Published by S. Chand & Company Ltd. Seventeenth edition:

Sections:-2.4, 2.7, 2.9, 3.1 to 3.8, 6.1 to 6.9, 7.1 to 7.8, 8.1, 8.2, 8.6

### **Reference Book:**

P.K. Jain and Khaleel Ahmed, "A Text Book of Analytical Geometry of Three Dimensions", Wiley Eastern Ltd., 1999.

**PATTERN OF THEORY QUESTION PAPER**

Max. Marks - 100

Question paper pattern for Mathematics Paper I (Part – II) (B.A./B.Sc.).

Duration of the Examination: 3 hours

Maximum Marks: 100

**Section A: (6 x 6 = 36 Marks)**

It consists of 8 short answer questions (2 from each unit) and the student has to answer 6 questions. Each question carries 6 marks.

Unit I

(1)

(2)

Unit II

(3)

(4)

Unit III

(5)

(6)

Unit IV

(7)

(8)

**Section B: (4 x 16 = 64 Marks)**

It consists of 8 long answer type questions (2 questions set from each unit). The student has to answer 4 questions, choosing one question from each unit. Each question carries 16 marks.

UNIT I

- (1) (a)
- (b)

(OR)

- (2) (a)
- (b)

UNIT II

- (3) (a)
- (b)

(OR)

- (4) (a)
- (b)

UNIT III

- (5) (a)
- (b)

(OR)

- (6) (a)
- (b)

UNIT IV

- (7) (a)
- (b)

(OR)

- (8) (a)
- (b)

### Scheme of Practical Examination for MATHEMATICS

The question paper consists of 4 questions with internal choice (a) or (b), taking one question from each unit. Question paper pattern is as follows: **Time: 3 hrs**

#### UNIT I

(1) (a)

(OR)

(b)

#### UNIT II

(2) (a)

(OR)

(b)

#### UNIT III

(3) (a)

(OR)

(b)

#### UNIT IV

(4) (a)

(OR)

(b)

Evaluation:

Each question carries  $7\frac{1}{2}$  marks. 4 questions carry :  $4 \times 7\frac{1}{2} = 30$  marks

For record = 10 marks

For Viva-Voce = 10 marks

Total marks = 50 marks

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# First Year MICROBIOLOGY Syllabus

## Paper I (Part – II)

### INTRODUCTORY MICROBIOLOGY

120 Hrs

Max. Marks - 100

#### UNIT – I History of Microbiology and Microscopy 30Hrs

Meaning, definition and history of Microbiology.	2 Hrs
Contributions of Antony von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Iwanowsky, Beijerinck, Winogradsky and Alexander Fleming.	10 Hrs
Importance and applications of Microbiology.	2 Hrs
Principles of microscopy – bright field, dark field, phase-contrast, fluorescent and electron microscopy (SEM and TEM). Ocular and stage micrometers.	10 Hrs
Size determination of microorganisms.	2 Hrs
Principles and types of stains - Simple stain, differential stain, negative stain, structural stains - spore, capsule, flagella. Hanging-drop method.	4 Hrs

#### UNIT – II Microbiological Techniques 30 Hrs

Sterilization and disinfection techniques. Principles and methods of sterilization.	2 Hrs
Physical methods - autoclave, hot-air oven, pressure cooker, laminar air flow, filter sterilization.	5 Hrs
Radiation methods - UV rays, gamma rays, ultrasonic methods.	4 Hrs
Chemical methods - Use of alcohols, aldehydes, fumigants, phenols, halogens and hypochlorites. Phenol coefficient.	5 Hrs
Isolation of pure culture techniques - Enrichment culturing, dilution-plating, streak-plate, spread-plate and micromanipulator.	8 Hrs
Preservation of microbial cultures - subculturing, overlaying cultures with mineral oils, lyophilization, sand cultures, storage at low temperature.	6 Hrs

#### UNIT – III Biology of Prokaryotic and Eukaryotic Microorganisms 30 Hrs

Outline classification of living organisms: Heckel, Whittaker and Carl Woese systems.	6 Hrs
Place of microorganisms in the living world.	2 Hrs
Differentiation of prokaryotes and eukaryotes.	1 Hr
Prokaryotes - General characteristics of bacteria, archaebacteria, rickettsias, mycoplasmas, cyanobacteria and actinomycetes.	6 Hrs
Outline classification for bacteria as per the second edition of Bergey's	

Manual of Systematic Bacteriology (up to section level).	2 Hrs
Ultrastructure of a bacterial cell: Invariant components - cell wall, cell membrane, ribosomes, nucleoid. Variant components - Capsule, flagella, fimbriae, endospore and storage granules.	6 Hrs
General characteristics and classification of viruses. Morphology and structure of TMV and HIV.	2 Hrs
Structure and multiplication of lambda bacteriophage.	2 Hrs
Eukaryotes - General characteristics and classification (up to the order level) of eukaryotic microorganisms - Protozoa, microalgae, molds and yeasts.	3 Hrs
<b>UNIT – IV      Biomolecules</b>	<b>30 Hrs</b>
Biomolecules of microorganisms.	1 Hr
Outline classification and general characteristics of carbohydrates (monosaccharides, disaccharides and polysaccharides).	5 Hrs
General characteristics of amino acids and proteins.	5 Hrs
Structure of nitrogenous bases, nucleotides, nucleic acids.	5 Hrs
Fatty acids (saturated and unsaturated) and lipids (spingolipds, sterols and phospholipids).	5 Hrs
Hydrogen ion concentration in biological fluids, pH measurement.	3 Hrs
Types of buffers and their use in biological reactions.	3 Hrs
Principle and application of colorimerty and chromatography (paper and thin-layer).	3 Hrs

#### **TEXT AND REFERENCE BOOKS:**

- Ram Reddy, S. and Reddy, S.M. (2007). **Essentials of Virology**. Scientific Publishers India, Jodhpur.
- Reddy, S.M. (2003). **University Microbiology –I**. Galgotia Publications New Delhi.
- Dube, R.C. and Maheswari, D.K. (2000) **General Microbiology**. S Chand ,New Delhi.
- Prescott, M.J., Harley, J.P. and Klein, D.A. (2002). **Microbiology**. 5<sup>th</sup> Edition, WCB Mc GrawHill, New York.
- Madigan, M.T., Martinkl, J.M. and Parker, J. (2000). **Brock Biology of Microorganisms**, 9<sup>th</sup> Edition, MacMillan Press, England.
- Stanier, R.Y., Adelberg, E.A. and Ingram, J.L. (1991). **General Microbiology**, 5th Ed., Prentice Hall of India Pvt. Ltd., New Delhi.
- Pelczar, M.J., Chan, E.C.S. and Kreig, N.R. (1993). **Microbiology**. 5<sup>th</sup> Edition, Tata Mc Graw Hill Publishing Co., Ltd., New Delhi.
- Rao, A.S. (1997). **Introduction to Microbiology**. Prentice-Hall of India Pvt Ltd., Nerw Delhi.

- Black, J.G. (2005). **Microbiology: Principles and Explorations**, John Wiley, USA.
- Voet, D. and Voet, J.G. (1995) **Biochemistry**, Wiley, New York.
- Zubay, G. (1998). **Biochemistry** WCB. Mc GrawHill, Iowa.
- Alexopoulos, C.J., Mims, C.W. and Blackwell, M. (1996). **Introductory Mycology**, Wiley, New York.
- Moore – Landecker, E. (1996). **Fundamentals of Fungi**, Prentice-Hall, NJ, USA.
- Atlas, R.A. and Bartha, R. (2000). **Microbial Ecology – Fundamentals and Application**, Benjamin Cummings, New York.
- Frobisher, H., Hinsdil, R.D., Crabtree, K.T. and Goodhert, D.R. (2005). **Fundamentals of Microbiology**, Saunder and Company, London.
- Power, C.B. and Dagainawala, H.F. (1986). **General Microbiology** Vol I & II (2<sup>nd</sup> Edition), Himalaya Publishing House, Mumbai.
- Sullia, S.B. and Shantaram, S. (1998). **General Microbiology**, Oxford & IBH Publishing Pvt. Ltd., New Delhi.
- Dimmock, N.J., Easton, A.J. and Leppard, K.N. (2001). **Introduction to Modern Virology**, Blackwell Science Ltd, U.K.
- Webster, J. (1980). **Introduction to Fungi**, Cambridge University Press, Cambridge, England.
- Singh, R.P. (2007). **General Microbiology**. Kalyani Publishers, New Delhi.
- Talaro, K. and Talaro, A. (1996). **Foundations in Microbiology**. 2<sup>nd</sup> Edition. UMC Brown Publications.
- Tortora, G.J., Funke, B.R. and Case, C.L. (2004). **Microbiology: An Intoduction**. Pearson Education, Singapore.
- Niclin, J. et al. (1999). **Instant Notes in Microbiology**. Viva Books Pvt. Ltd., New Delhi.

**Practical – I: INTRODUCTORY MICROBIOLOGY**

**90 Hrs**  
**Marks - 50**

1. Precautions to work in Microbiology laboratory.
2. Preparation of culture media: Solid / Liquid.
3. Sterilization techniques: Autoclving, hot-air oven and filtration.
4. Isolation of single colonies on solid media.
5. Enumeration of bacterial numbers by serial dilution and plating.
6. Light compound microscope and its handling.
7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram –ve bacilli), cyanobacteria (*Nostoc*, *Spirulina*), algae (*Scenedesmus* sp., diatoms), and fungi (*Saccharomyces*, *Rhizopus*, *Aspergillus*, *Penicillium*, *Fusarium*).
8. Calibrations of microscopic measurements (Ocular, stage micrometers).
9. Measuring dimensions of fungal spores
10. Simple and differential staining (Gram staining).
11. Spore staining, capsule staining and negative staining.
12. Diagramatic or Electron photomicrographic observation of TMV, HIV, T4 phage and adenovirus

## **REFERENCE BOOKS FOR LAB:**

- Gopal Reddy, M., Reddy, M.N., Saigopal, DVR and Mallaiiah, K.V. (2007). **Laboratory Experiments in Microbiology**, 2<sup>nd</sup> edition. Himalaya Publishing House, Mumbai.
- Reddy, S.M. and Reddy S.R. (1998). **Microbiology – Practical Manual**, 3<sup>rd</sup> Edition, Sri Padmavathi Publications, Hyderabad.
- Aneja, K.R. (2001). **Experiments in Microbiology, Plant pathology, Tissue culture and Mushroom Production Technology**, 3<sup>rd</sup> Edition, New Age International (P) Ltd, Publishers, New Delhi.
- Dubey, R.C. and Maheswari, D.K. (2006). **Practical Microbiology**, S. Chand & Co., New Delhi.
- Cappuccino, J.G. and Sherman, N. (2005). **Microbiology – A Laboratory Manual**. 7<sup>th</sup> Edition. Pearson Education. Published by Dorling Kindersley (India) Pvt. Ltd.
- Mahy, B.W.J. and Kangro, H.O. (1996). **Virology – Methods Manual**. Academic Press, USA.
- Burleson *et al.* (1992). **Virology – A Laboratory Manual**. Academic Press, USA
- Alcama, I.E. (2001). **Laboratory Fundamentals of Microbiology**. Jones and Bartlett Publishers, USA.
- Benson, J.H. (2005). **Microbiological Applications: Laboratory Manual in General Microbiology**. 7<sup>th</sup> Edition, McGraw Hill Publications, New York.



**MICROBIOLOGY**  
**Model Question Paper (Lab)**  
**Lab: I (Part - II)**

Time: 3 Hrs

Max. Marks: 50

- |                      |          |
|----------------------|----------|
| 1. Major Experiment  | 20 Marks |
| 2. Minor Experiment  | 10 Marks |
| 3. Spottings (5 Nos) | 15 Marks |
| 4. Record            | 5        |

# First Year PHYSICS Syllabus

## Paper – I (Part – II)

### Mechanics and Waves and Oscillations

Max. Marks - 100

**120hrs**

**(4 hrs/week)**

#### Unit – I

##### 1. Vector Analysis (10):

**30 hrs**

Scalar and vector fields, gradient of a scalar field and its physical significance. Divergence and curl of a vector field and related problems. Vector integration, line, surface and volume integrals. Stokes, Gauss and Greens theorems- simple applications.

##### 2. Mechanics of Particles(10)

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter, scattering cross-section, Rutherford scattering

##### 3. Mechanics of rigid bodies(10)

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor. Eulers equation, precession of a top, Gyroscope, precession of the equinoxes

#### Unit – II

**30 hrs**

##### 4 Mechanics of continuous media(8)

Elastic constants of isotropic solids and their relation, Poisson's ratio and expression for Poisson's ratio in terms of  $\gamma$ ,  $n$ ,  $k$ . Classification of beams, types of bending, point load, distributed load, shearing force and bending moment, sign conventions, simple supported beam carrying a concentrated load at mid span, cantilever with an end load

##### 5 Central forces(12)

Central forces – definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational

potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.

## **6 Special theory of relativity(10)**

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation. Concept of four vector formalism.

### **Unit – III**

**30 hrs**

## **7 Fundamentals of vibrations(12)**

Simple harmonic oscillator, and solution of the differential equation– Physical characteristics of SHM, torsion pendulum, - measurements of rigidity modulus , compound pendulum, measurement of 'g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures

## **8 Damped and forced oscillations(12)**

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance

## **9 Complex vibrations(6)**

Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave, triangular wave, saw-tooth wave

### **Unit – IV**

**30 hrs**

## **10 Vibrations of bars(12)**

Longitudinal vibrations in bars- wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

## 11 Vibrating Strings (12)

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at both ends, overtones, energy transport, transverse impedance

## 12. Ultrasonics(6)

Ultrasonics, properties of ultrasonic waves, production of ultrasonics by piezoelectric and magnetostriction methods, detection of ultrasonics, determination of wavelength of ultrasonic waves. Velocity of ultrasonics in liquids by Sear's method. Applications of ultrasonic waves.

**NOTE:** Problems should be solved at the end of every chapter of all units.

### Textbooks

1. Berkeley Physics Course. Vol.1, **Mechanics** by C. Kittel, W. Knight, M.A. Ruderman - *Tata-McGraw hill Company Edition 2008.*
2. **Fundamentals of Physics.** Halliday/Resnick/Walker *Wiley India Edition 2007.*
3. **Waves and Oscillations.** S. Badami, V. Balasubramanian and K. Rama Reddy *Orient Longman.*
4. **First Year Physics** - *Telugu Academy.*
5. **Mechanics of Particles, Waves and Oscillations.** Anwar Kamal, *New Age International.*
6. **College Physics-I.** T. Bhimasankaram and G. Prasad. *Himalaya Publishing House.*
7. **Introduction to Physics for Scientists and Engineers.** F.J. Ruche. *McGraw Hill.*
8. **Waves and Oscillations.** N. Subramaniam and Brijlal *Vikas Publishing House Private Limited.*

### Reference Books

1. **Fundamentals of Physics** by Alan Giambattista et al *Tata-McGraw Hill Company Edition, 2008.*
2. **University Physics** by Young and Freeman, *Pearson Education, Edition 2005.*
3. **Sears and Zemansky's University Physics** by Hugh D. Young, Roger A. Freedman *Pearson Education Eleventh Edition.*
4. **An introduction to Mechanics** by Daniel Kleppner & Robert Kolenkow. *The McGraw Hill Companies.*
5. **Mechanics.** Hans & Puri. *TMH Publications.*

6. **Engineering Physics**. R.K. Gaur & S.L. Gupta. *Dhanpat Rai Publications*.

**Practical - I**

(At least 12 practicals are to be performed out of 16)

Max. Marks - 50

90 hrs

(3 hrs / week)

1. Study of a compound pendulum determination of 'g' and 'k'.
2. Study of damping of an oscillating disc in Air and Water logarithmic decrement.
3. Study of Oscillations under Bifilar suspension.
4. Study of oscillations of a mass under different combination of springs.
5. 'Y' by uniform Bending (or) Non-uniform Bending.
6. Verification of Laws of a stretched string (Three Laws).
7. Moment of Inertia of a fly wheel.
8. Measurement of errors –simple Pendulum.
9. Determination of frequency of a Bar-Melde's experiment.
10. 'n' by torsion Pendulum.
11. Observation of Lissajous figures from CRO.
12. Study of flow of liquids through capillaries.
13. Determination of Surface Tension of a liquid by different methods.
14. Study of Viscosity of a fluid by different methods.
15. Volume Resonator –determination of frequency of a tuning fork.
16. Velocity of Transverse wave along a stretched string.

## **MODEL PAPER for PHYSICS**

### **SECTION – A**

(Essay type questions - 4 x 15 = 60)

1. One question from each unit with internal choice.

### **SECTION – B**

(short questions 5 x 4 = 20)

Two questions from each unit

Total questions = 8

Answer any 5 questions

### **SECTION – C**

Problems

(5 x 4 = 20)

Answer any five questions

Two problems from each unit.

Total: Eight problems

### ***Practicals scheme of valuation***

1. Formula and explanation of symbols - (5 marks)
  2. Tabular forms with circuit diagram wherever necessary - (5 marks)
  3. Observations - (15 marks)
  4. Calculations and graphs - (8 marks)
  5. Result - (2 marks)
  6. Viva-voce - (5 marks)
  7. Practical Record - (10 marks)
- (Through internal assessment by the lecturer concerned)

Total Marks - (50 marks)

# **First Year STATISTICS Syllabus**

**(With Mathematics Combination)**

**Paper-I (Part – II)**

Max. Marks - 100

**120 hrs**  
**(4 hrs/ week)**

## **Descriptive Statistics and Probability Distributions**

1. **Descriptive Statistics:** Concept of primary and secondary data. Methods of collection of primary data and secondary data. Classification and tabulation of data. Measures of central tendency (mean, median, mode, geometric mean and harmonic mean) topics are constrained to definitions merits and demerits only (but proofs are not necessary). Concepts of absolute & relative measure of dispersion (range, quartile deviation, mean deviation, and standard deviation) 1Q 7 L
2. Importance of moments, central and non-central moments, and their interrelationships, Sheppard's corrections for moments for grouped data. Measures of skewness based on quartiles and moments and kurtosis based on moments with suitable examples. 1Q 8 L
3. Basic concepts in Probability—deterministic and random experiments, trial, outcome, sample space, event, and operations of events, mutually exclusive and exhaustive events, and equally likely and favourable outcomes with examples. Mathematical, statistical and axiomatic definitions of probability with merits and demerits. Properties of probability based on axiomatic definition. Conditional probability and independence of events. Addition and multiplication theorems for  $n$  events. Boole's inequality and Bayes' theorem. Problems on probability. 1Q 15 L
4. Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties. Transformation of one-dimensional random variable (simple 1-1 functions only). Notion of bivariate random variable, bivariate distribution and statement of its properties. Joint, marginal and conditional distributions. Independence of random variables. 1Q 15 L
5. **Mathematical Expectation:** Mathematical expectation of a function of a random variable. Raw and central moments and covariance using mathematical expectation with examples. Addition and multiplication theorems of expectation. Definition of moment generating function (m.g.f), cumulant generating function (c.g.f), probability generating function (p.g.f) and characteristic function (c.f) and statements of their properties with applications. Chebyshev's, and Cauchy-Schwartz's inequalities. Statement of weak law of large numbers and central limit theorem for identically and independently distributed (i.i.d) random variables with finite variance. 1Q 15 L
6. **Discrete distributions:** Uniform, Bernoulli, Binomial, Poisson, Negative binomial, Geometric and Hyper-geometric(mean and variance only) distributions. Properties of these distributions such as m.g.f, c.g.f., p.g.f., c.f., & derive moments up to second order from them. Reproductive property wherever exists. Binomial approximation to Hyper-geometric, Poisson approximation to Binomial and Negative BD. 1Q 30 L
7. **Continuous distributions:** Rectangular and Normal distributions. Normal distribution as a limiting case of Binomial and Poisson distributions. Exponential, Gamma, Beta of two

kinds (mean and variance only) and Cauchy (definition and c.f. only) distributions. Properties of these distributions such as m.g.f., c.g.f., c.f., and moments up to fourth order, their real life applications and reproductive property wherever exists.  
1Q 30 L

Note: Paper setter is requested to follow the questions allocated as above.

**List of reference books:**

1. Introduction to Probability theory and its applications. Volume –I, Willam Feller
2. Fundamentals of Mathematical Statistics, V.K.Kapoor and S.C.Gupta
3. Sahasambandam – Vibhajana Siddhantamulu – Telugu Academy
4. Fundamentals of Statistics , Vol-I, GoonAM,Gupta MK, Das Gupta B
5. Introduction to mathematical statistics, Hoel P.G
6. Sambhavyata Avadhi siddantalu – Telugu Academy
7. A text book of statistics paper – I M.aganmohana Rao and Papa Rao

## Practical – I

Max. Marks - 50

**90 hrs**  
(3 hrs/ week)

1. Basics of Excel- data entry, editing and saving, establishing and copying a formulae, built in functions in excel, copy and paste and exporting to MS word document.
2. Graphical presentation of data (Histogram, frequency polygon, Ogives).
3. Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS Excel
4. Diagrammatic presentation of data (Bar and Pie).
- 5. Diagrammatic presentation of data (Bar and Pie) using MS Excel**
6. Computation of non-central and central moments – Sheppard's corrections and  $\beta_1$  and  $\beta_2$  for grouped data &  $\beta_1$  and  $\beta_2$
7. Computation of coefficients of Skewness and Karl Pearson's and Bowley's.
8. Computation of measures of central tendency, dispersion and coefficients of Skewness, Kurtosis using MS Excel.
9. Fitting of Binomial distribution – Direct method.
- 10 Fitting of Binomial distribution – Direct method using MS Excel.**
11. Fitting of binomial distribution – Recurrence relation Method.
12. Fitting of Poisson distribution – Direct method.
- 13. Fitting of Poisson Distribution – Direct method using MS Excel.**
14. Fitting of Poisson distribution - Recurrence relation Method.
15. Fitting of Negative Binomial distribution.
16. Fitting of Geometric distribution.
17. Fitting of Normal distribution – Areas method.
18. Fitting of Normal distribution – Ordinates method.
19. Fitting of Exponential distribution.
- 20. Fitting of Exponential distribution using MS Excel.**
21. Fitting of a Cauchy distribution.
- 22. Fitting of a Cauchy distribution using MS Excel.**

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

# **First year ZOOLOGY Syllabus**

## **PAPER I (Part – II) BIOLOGY OF INVERTEBRATES AND CELL BIOLOGY**

Max. Marks - 100

### **UNIT I**

#### **1.0 Protozoa to Annelida**

**120 hrs  
(4 hrs/week)**

1.1. Phylum Protozoa: General characters and outline classification up to classes.

Type study: *Paramecium*.

**5 hours**

1.2. Phylum Porifera : General characters and outline classification up to classes.

Type study: *Sycon*; Canal system in Sponges.

**5 hours**

1.3. Phylum Cnidaria: General characters and outline classification up to classes. Type study:

*Obelia*; Polymorphism in Cnidaria; Corals and Coral reef formation.

**7 hours**

1.4. Phylum Platyhelminthes: General characters and outline classification up to classes. Type

study: *Fasciola hepatica*.

**5 hours**

1.5. Phylum Nematelminthes: General characters and outline classification up to classes.

Type study: *Ascaris lumbricoides*.

**3 hours**

1.6. Phylum Annelida: General characters and outline classification up to classes

Type study: Leech;

**5 hours**

### **UNIT II**

#### **2.0. Arthropoda to Hemichordata**

2.1. Phylum Arthropoda: General characters and outline classification of up to classes

Type study: *Palaemon*; *Peripatus*- Characters and Significance.

**10 hours**

2.2. Phylum Mollusca: General characters and outline classification of up to classes

Type study: *Pila*;

**8 hours**

2.3. Phylum Echinodermata: General characters and outline classification of up to classes.

Type study: Star fish.

**7 hours**

2.4. General characters of Hemichordata : Structure and affinities of *Balanoglossus*.

**5 hours**

### UNIT III

#### 3.0. Cell Biology

- 3.1. Structure of Plasma membrane - Fluid-mosaic model. Transport functions of Plasma membrane – Passive transport, active transport **5 hours**
- 3.2. Structure and functions of Endoplasmic reticulum Golgi body, Ribosomes, Lysosomes and Mitochondria. **8 hours**
- 3.3. Chromosomes - nomenclature types and structure. Giant chromosomes – Polytene and Lampbrush chromosomes. **4 hours**

### UNIT IV

#### 4.0. Biomolecules of the cell

##### 4.1. Carbohydrates:

- 4.1.1. Classification of Carbohydrates **3 hours**
- 4.1.2. Structure of Monosaccharides (Glucose and Fructose) **4 hours**

##### 4.2. Proteins:

- 4.2.1. Amino acids: General properties, nomenclature, classification and structure. **3 hours**
- 4.2.2. Classification of proteins

##### 4.3. Lipids:

- 4.3.1. Classification of lipid.

##### 4.4. Nucleic acids:

- 4.4.1. Watson and Crick model of DNA- Nucleoside, Nucleotide, Chargaff's rule. **4 hours**  
Structure of RNA, Types of RNA - rRNA, tRNA and mRNA.

## PRACTICAL – I

Max. Marks - 50  
90 hrs  
(3 hrs / week)

### 1. INVERTEBRATES: Observation of the following slides / specimens / models:

**Protozoa** - *Elphidium, Monocystis, Paramoecium* – binary fission and Conjugation.

**Porifera** - *Spongilla, Euspongia*.

**Cnidaria** - *Physalia, Velella, Corallium, Gorgonia, Aurelia, Pennatula, Obelia colony, Medusa*.

**Platyhelminthes and Nematelminthes** - *Planaria, Larval stages of Fasciola Miracidium, Redia, Cercaria, Echinococcus granulosus Schistosoma haematobium, Ancylostoma duodenale*.

**Annelida** - *Nereis, Aphrodite, Hirudo, Trochophore larva*.

**Arthropoda** - *Sacculina, Limulus, Julus, Scolopendra, Anopheles mouthparts (male and female), Peripatus*.

**Mollusca** - *Chiton, Unio, Teredo, Sepia, Octopus, Nautilus, Glochidium larva*.

**Echinodermata** - *Ophiothrix, Echinus, Clypeaster, Cucumaria, Antedon, Bipinnaria larva*.

**Hemichordata** – *Balanoglossus, Tornaria larva*.

### 2. DISSECTIONS:

Leech: Reproductive and excretory systems, Mounting Jaws and Nephridia.

Prawn: Nervous system, mounting statocyst and appendages or as an alternatively crab/Scorpion/ locust (digestive system)

*Unio* or *Pila*: Nervous system, Mounting radula of *Pila*.

### CELL BIOLOGY:

1. Identification of stages from prepared slides showing Mitosis and Meiosis
2. Identification of salivary gland chromosomes and polytene chromosomes (Photographs or figures).

## REFERENCE BOOKS

### Biology of Invertebrates:

1. 'The Invertebrates' by L.H. Hyman. Vol I, II and V. – M.C. Graw Hill Company Ltd .
2. 'Invertebrate Zoology' - A functional Evolutionary approach. Ruppert, Fox and Barnes., Thomas publishers. Indian Edition.
3. 'Invertebrate Zoology' by E.L. Jordan and P.S. Verma., S.Chand and Company.
4. 'Invertebrate Zoology' by R.D. Barnes : W.B. Sauwonders CO., 1986.
5. 'Invertebrate structure and Function' by Barrington. E.J.W ., ELBS.
6. 'A student text book of Zoology' by Sedgwick, A., Vol-I, II and III – Central Book Depot, Allahabad.
7. 'A text book of Zoology' by Parker, T.J. and Haswell, W.A., Mac Millan Co. London.
8. 'Textbook of Invertebrates' by Kavita Juneja and H.S. Bhamrah.

### Cell Biology:

1. 'Molecular Cell Biology' by Lodish, Berk, Kaiser, Scott.– Scientific American Books.
2. 'Cell and Molecular Biology' by De Robertis & De Robertis : Saunders College.
3. 'Cell Biology, Genetic Evolution and Ecology' by P.S.Varma and V.K. Agrawal; S. Chand and Company.
4. 'Molecular Biology' by Mohan P. Arora., Himalaya Publishing House Pvt.Ltd.
5. 'Manual of Laboratory Experiments in Cell Biology' – Edward Gasque: (W.C. Brouh Publishers.
6. 'Biomolecules' by Mohan P.Arora., Himalaya Publishing House Pvt.Ltd.
7. 'Cell and Molecular Biology' –P.K.Gupta.
8. 'Concepts of Cell Biology' - P.S.Verma and V.K.Agarwal
9. Biochemistry –U. Sathyanarayana and U. Chakrapani.
10. Biology –Campbell and Reece.
11. Molecular biology of the cell-Alberts et.,al
12. 'Cell Biology' by S.C. Rastogi
13. ' Cell Biology' by C.B. Powar, Himalayan Publications.