B. P. S. Mahila Vishwavidyalaya, Khanpur Kalan (Sonepat)

(State University Established Under the Legislative Act No 31/2006)

Course Curriculum & Scheme of Examination

For

B.Sc. Computer Science

(w.e.f. 2017-18)

The Bachelor of Science in Computer Science is a three year full time programme. The course structure of programme is given under:-

Semester – 1

S. No.	Code	Course Title	Hours /Week			Total Credits	Max Marks		
			L	T	P		Internal Marks	External Marks	Total Marks
Theory									
1	CSC - 101A	Computer Fundamentals	3	-	-	3	10	40	50
2	CSC - 101B	Logical Organization of Computer	3	-	-	3	10	40	50
Lab									
3	CSP - 101	Computer Fundamentals Lab.	-	-	4	2	10	40	50
Total			6	-	4	8	30	120	150

Total Contact Hours=10 **Total Credits=8**

Note: Minimum passing marks for any subject (paper) shall be 40% in the external examination and 40% the aggregate of internal and external examinations of the subject.

B.P.S. Institute of Higher Learning

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Course Curriculum & Scheme of Examination

For

B.Sc. Computer Science

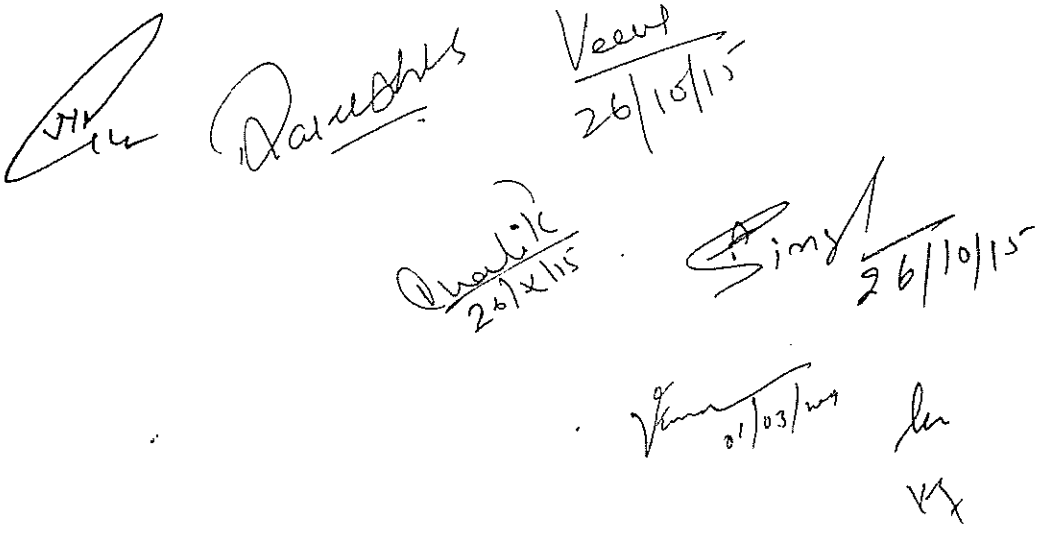
(w.e.f. 2015-16)

Semester – 2

S. No.	Code	Course Title	Hours /Week			Total Credits	Max Marks		
			L	T	P		Interna Marks	External Marks	Total Marks
Theory									
1	CSC - 102A	Programming in C	3	-	-	3	10	40	50
2	CSC - 102B	Computer Networks	3	-	-	3	10	40	50
Lab									
3	CSP - 102	Programming in C ~~Practical~~ Lab	-	-	4	2	10	40	50
Total			6	-	4	8	30	120	150

Total Contact Hours=10 **Total Credits=8**

Note: Minimum passing marks for any subject (paper) shall be 40% in the external examination and 40% in the aggregate of internal and external examinations of the subject.



B.P.S. Institute of Higher Learning

B. P. S. Mahila Vishwavidyalaya, Khanpur Kalan (Sonepat)

(State University Established Under the Legislative Act No 31/2006)

Course Curriculum & Scheme of Examination

For

B.Sc. Computer Science

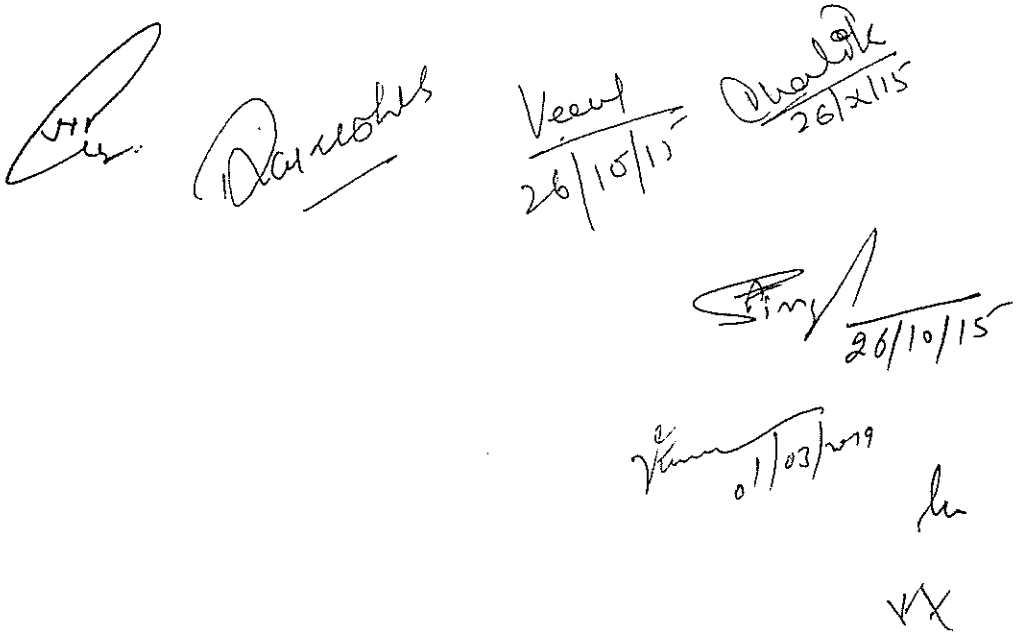
(w.e.f. 2015-16)

Semester – 3

S. No.	Code	Course Title	Hours /Week			Total Credits	Max Marks		
							Interna Marks	External Marks	Total Marks
			L	T	P				
Theory									
1	CSC--201A	Data & File Structure using C	3	-	-	3	10	40	50
2	CSC--201B	Computer System Architecture	3	-	-	3	10	40	50
Lab									
3	CSP -201	Data & File Structure using C ~~Practical~~ Lab	-	-	4	2	10	40	50
Total			6	-	4	8	30	120	150

Total Contact Hours=10 **Total Credits=8**

Note: Minimum passing marks for any subject (paper) shall be 40% in the external examination and 40% in the aggregate of internal and external examinations of the subject.



B.P.S. Institute of Higher Learning

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(State University Established Under the Legislative Act No 31/2006)

Course Curriculum & Scheme of Examination

For

B.Sc. Computer Science

(w.e.f. 2015-16)

Semester – 4

S. No.	Code	Course Title	Hours /Week			Total Credits	Max Marks		
			L	T	P		Interna Marks	External Marks	Total Marks
Theory									
1	CSC- 202A	Advanced Data and File Structure	3	-	-	3	10	40	50
2	CSC- 202B	Object Oriented Programming with C++	3	-	-	3	10	40	50
Lab									
3	CSP- 202	Object Oriented Programming with C++ ~~Practical~~ Lab	-	-	4	2	10	40	50
Total			6		4	8	30	120	150

Total Contact Hours=10

Total Credits=8

Note: Minimum passing marks for any subject (paper) shall be 40% in the external examination and 40% in the aggregate of internal and external examinations of the subject.

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B.P.S. Institute of Higher Learning

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(State University Established Under the Legislative Act No 31/2006)

Course Curriculum & Scheme of Examination

For

B.Sc. Computer Science

(w.e.f. 2015-16)

Semester – 5

Code	Course Title	Hours /Week			Total Credits	Max Marks		
		L	T	P		Interna Marks	External Marks	Total Marks
ory								
CSC- 301A	Data Base Management System	3	-	-	3	10	40	50
CSC - 301B	Operating System	3	-	-	3	10	40	50
)								
CSP -301	Data Base Management System ~~Practical~~ Lab	-	-	4	2	10	40	50
al		6	-	4	8	30	120	150

Total Contact Hours=10 **Total Credits=8**

lote: Minimum passing marks for any subject (paper) shall be 40% in the external examination and 40% in he aggregate of internal and external examinations of the subject.

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B.P.S. Institute of Higher Learning

B. P. S. Mahila Vishwavidyalaya, Khanpur Kalan (Sonepat)

(State University Established Under the Legislative Act No 31/2006)

Course Curriculum & Scheme of Examination

For

B.Sc. Computer Science

(w.e.f. 2015-16)

Semester – 6

S. No.	Code	Course Title	Hours /Week			Total Credits	Max Marks		
			L	T	P		Interna Marks	External Marks	Total Marks
Theory									
1	CSC - 302A	Visual Basic Programming	3	-	-	3	10	40	50
2	CSC- 302B	Software Engineering	3	-	-	3	10	40	50
Lab									
3	CSP- 302	Visual Basic Programming ~~Practical~~ Lab	-	-	4	2	10	40	50
Total			6	-	4	8	30	120	150

Total Contact Hours=10 **Total Credits=8**

Note: Minimum passing marks for any subject (paper) shall be 40% in the external examination and 40% in the aggregate of internal and external examinations of the subject.

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(1) Each subject/course in B.Sc. Computer Science of 3/3 Credit is of 50 marks having 10 internal and 40 external marks.

(2) Each lab in scheme of B.Sc. Computer science of 2 Credit is of 50 marks having 10 internal and 40 external marks.

Grand Total of credits/Marks for the B.Sc. Computer Science,BPSIHL,BPSMV,Khanpur Kalan,Sonepat		
S.No.	**Semester**	**Credits/Marks**
1	I	8/150
2	II	8/150
3	III	8/150
4	IV	8/150
5	V	8/150
6	VI	8/150
Total		48/900
All external examinations (Theory and Practical) are of three hours duration		

Paper Code: CSC – 101A

1st Semester
Computer Fundamentals

L – T – P
3 -- --

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt Five questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit -1

Introduction to computer - Evolution of computers, classification of computers, model of a digital computer, functioning of a digital computer, usefulness of computers, Human being Vs computers, applications of computers (desktop publishing, sports ,design and manufacturing research, military robotics, planning & management, marketing, medicine & health care, arts, communication etc.).

Unit 2

Input/out devices: Punch cards, card-readers, Keypunching machines, keyboards, mouse, joysticks, trackball, Digitizer, Voice-recognition devices, Scanner and terminal.

Hard copy devices - Types of printer: Impact printer (DMP, Daisy wheel, line, drum printer, chain printer), Non Impact printer (laser, inkjet, thermal), plotters, soft copy devices, monitor, video standards.

Memory & Mass Storage devices: Characteristics of memory system, types of memory : RAM, ROM, Magnetic disks, floppy disk ,hard disk, optical disk, optical disk CD, CD-ROM, magnetic tapes, concept of virtual & cache memory.

Unit 3

Software Concepts: Introduction, types of software - System & Application software; Language translators- Compiler, Interpreter, Assembler; System utilities - Editor, Loader, Linker.

Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single-user & multi-user operating system.

Unit 4

Features of Microsoft Windows: 98, XP, Windows-2003, Windows -7, Windows - 10.

MS-WORD: Text manipulation (change the font size and type, aligning and justification of text, Underlining the text, indenting the text. Usages of numbering, bullets, footer and headers. Usages of spell check and find and replace, difference between .doc and .docx .

Tables and manipulation: Creation, insertion, deletion (columns & rows) and usage of auto format, creation of documents using templates, Mail merge concept, macros.

Suggested Readings:

1. Gill, Nasib S.: Essentials of Computer and Network Technology, Khanna Book Publishing Co.,New Delhi.
2. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
3. Chhillar, Rajender S.: Application of IT in Business, Ramesh Publishers, Jaipur.
4. Donald Sanders: Computers Today, McGraw-Hill Publishers.
5. Davis: Introduction to Computers, McGraw-Hill Publishers.
6. V. Rajaraman : Fundamental of Computers, Prentice-Hall India Ltd., New Delhi.
7. Learning MS-Office2000 by R Bangia (Khanna Book Pub)
8. Teach yourself MS-Office by Sandlers (BPB Pub).
9. Using MS-Office by Bott(PHI).

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

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4. Nagoor Kani N.S. and Dixit J.B.: Digital Design and Computer Organization, University Science Press (An imprint of Laxmi Publications), N. Delhi)
5. William Stallings: Computer Architecture and Organization, Maxell Publication.
4. Mano, M.M.: Digital Design, 2nd ed., Prentice-Hall of India.
5. Salivahanan and Arivazhagan: Digital Circuits and Design, Vikas Publ. House Pvt. Ltd.,
6. J.P. Hayes: Computer Architecture and Organization by J.P. Hayes, Tata McGraw-Hill, New Delhi.
7. Gear C.W.: Computer Organization and Architecture, Prentice Hall of India Ltd., New Delhi.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

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CSP – 101

Computer Fundamentals Lab.

Total Credits: 02

Time-3Hrs
External Marks: 40
Internal Marks: 10

Practical Based on CSC-101 (Windows, Ms-Office)

Internal Assessment Marks (For Theory Papers)

Sr.No.	Criteria	Marks
1	One mid term exam	5
2	Seminar/Assignment	2.5
3	Attendance	2.5
	Total	10

Internal Assessment Marks (For Practical)

Sr.No.	Criteria	Marks
1	Practical Sheet/Program Execution	5
2	Practical File/Viva-Voce	2.5
3	Lab Attendance	2.5
Total		10

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M-17

2nd Semester

Paper Code: CSC- 102A **Programming in 'C'**

L – T – P
- - -

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit-I

Basic concepts of programming, techniques of problem solving, algorithm designing and flowcharting, concept of structured programming-Top-Down design, Development of efficient program; Program correctness; Debugging and testing of programs

Unit-II

Overview of C: History of C, Importance of C, Structure of a C Program Elements of C: C character set, identifiers and keywords, Data types: declaration and definition. Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associatively, input/output statements, Arithmetic Expression, Evaluation of Arithmetic Expression, Type-casting and Conversion.

Unit-III

Decision making & branching: Decision making with if statement, if-else statement, nested if, else-if ladder, switch statement, goto statement. Decision making & looping: for, while, and do-while loop; Jumps in loop, break, continue. Functions: Definition, prototype, passing parameters, Recursion.

Unit-IV

Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays. Data Structures: Arrays: One Dimensional, Multidimensional, Pointers and arrays. Strings: String Constants, Input & Output, String Functions. Structure & Unions. File Handling: Standard I/O text File, Writing to File, Reading a File.

Suggested Readings:

1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
2. Gottfried: C Programming (Schaum's Outline Series), Tata McGraw-Hill Publishers.
3. Kanetkar: Let Us C, BPB Publications, New Delhi.
4. E. Balagurusamy: C Programming (Tata McGraw-Hill Publishers)
5. Donald Sanders: Computers Today, McGraw-Hill Publishers.

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6. Davis: Introduction to Computers, McGraw-Hill Publishers.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

Paper Code: CSC- 102 Computer Networks

L – T – P
3 -- --

Total Credits: 03
External Marks: 40
Internal Marks: 10

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit I

Basic concepts: Components of data communication. Line configuration, transmission mode, OSI TCP/IP Models: Layers and their functions, comparison of models.

Digital transmission: Interfaces and modems: DTC-DEC Interfaces, modems cable modem.

Transmission media: Guided and unguided attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Channel Capacity, Shannon capacity.

Unit II

Introduction to signals. Analogue and digital signals, Periodic and aperiodic signals, time and frequency domains, composite signals

Encoding and modulation: Digital to digital conversion analogue to digital conversion. Analogue to Analogue conversion

Multiplexing, error detection and correction: Many to one, many to many, WDM, TDM, FDM, Telephone system, DSL, CDMA, FTTC

Unit III

Data link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Ethernet. Token Bus, token ring, FDDI, SMDS

Switching: Circuit switching packet switching, message switching.

Unit IV

Internetworking: Repeaters, bridges, gateways, Switch/Hub, Router, Tunnelling, Fragmentation, Firewalls

Network Security: Cryptography-Public Key, secret Key, DNS- E-mail and WWW, E-mail Architecture.

Suggested Readings:

1. B.A. Forouzan: Data Communication and Networks 2nd Edition Tata Mc Graw Hill
2. A.S. Tanenbaums. Computer Networks Prentics Hall of India
3. J.E. Hayes, Modeling and Analysis of Computer Communication Networks, press.
4. D.E. Comer. Internetworking with TCP/IP, Vol. I. Prentice Hall of India.
5. W. Sralling. Data & Computer Communication, Maxwell Miamian Intranation Edition.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

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Paper Code: CSP- 102
L – T – P
- -- - 4
Time-3Hrs
External Marks: 40
Internal Marks: 10

Programming in 'C' ~~Practical~~ Lab

Total Credits: 02
Total Marks: 50

Note:

Practical ("C" Language)

Internal Assessment Marks (For Theory Papers)

Sr.No.	Criteria	Marks
1	One mid term exam	5
2	Seminar/Assignment	2.5
3	Attendance	2.5
	Total	**10**

Internal Assessment Marks (For Practical)

Sr.No.	Criteria	Marks
1	Practical Sheet/Program Execution	5
2	Practical File/Viva-Voce	2.5
3	Lab Attendance	2.5
Total		**10**

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3rd Semester

Paper Code: CSC – 201A **Data & File Structure using 'C'** **Total Credits: 03**

L – T – P **External Marks: 40**

3 -- -- **Internal Marks: 10**

Time: 3 Hrs.

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit I

Introduction to data structures ,memory management techniques ,data structure Operations ,Algorithm notations ,complexity of algorithm & time space trade off, arrays , different operations on arrays.

Unit II

Stack, memory representation of stacks ,operation of stack, application of stack (Polish notations recursion) ,Queues, Operations on Queues, types of Queues ,liked lists, representation of liked list ,types of linked list.

Unit III

Searching (Internal External) , Searching techniques (Linear, Binary search)

Sorting techniques : Bubble Sort ,Selection Sort ,Insertion sort ,Quick sort, merge sort .

Unit IV

Introduction to files : components of file. Reasons for structuring files, logical data organization concepts of keys ,types of files (According to function ,Access mode), file operations, file system .

Suggested Readings:

1. Lipschutz: Data Structures (Schaum's Outline Series), Tata McGraw-Hill.
2. Adam Drozdek: Data Structures and Algorithms in C++, Vikas Pub. House (Thmpson), New Delhi.
3. Gupta Amit: Data Structures Through C, Galgotia Booksource Pvt. Ltd., New Delhi.

4. Sofat S.: Data Structures With C and C++, Khanna Book Pub. Co.(P) Ltd, N. Delhi

5. Dromey R.G: How to Solve it by Computer ?, Prentice Hall India.

6. Loomis: Data Structure and File Management, Prentice-Hall India Ltd.

7. Tannenbaum: Data Structure Using C, Tata McGraw-Hill.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

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Paper Code: CSC – 201B
L – T – P
3 -- --

Computer System Architecture

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT I

Sequential Circuits: Designing registers – Serial Input Serial Output (SISO), Serial Input Parallel Output (SIPO), Parallel Input Serial Output (PISO), Parallel Input Parallel Output (PIPO)
State table, state diagram and state equations. Flip-flop excitation tables

UNIT II

Shift registers. Designing counters – Asynchronous and Synchronous Binary Counters, Modulo-N Counters and Up-Down Counters

UNIT III

Memory & I/O Devices: Memory Parameters, Semiconductor RAM, ROM, Magnetic and Optical Storage devices, Flash memory, I/O Devices and their controllers.

UNIT IV

Instruction Design & I/O Organization: Machine instruction, Instruction set selection, Instruction cycle, Instruction Format and Addressing Modes. I/O Interface, Interrupt structure, Program controlled, Interrupt-controlled & DMA transfer, I/O Channels, IOP.

Suggested Readings:

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
2. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
3. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
4. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

Paper Code: CSP – 201
L – T – P
-- -- 4
Time-3Hrs
External Marks: 40
Internal Marks: 10

Data & File Structure Using 'C' ~~Practical~~ Lab

Total Credits: 02
Total Marks: 50

Note: Practical (Data Structure Using "C" Language)

Internal Assessment Marks (For Theory Papers)

Sr.No.	Criteria	Marks
1	One mid term exam	5
2	Seminar/Assignment	2.5
3	Attendance	2.5
	Total	**10**

Internal Assessment Marks (For Practical)

Sr.No.	Criteria	Marks
1	Practical Sheet/Program Execution	5
2	Practical File/Viva-Voce	2.5
3	Lab Attendance	2.5
Total		**10**

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4th Semester

Paper Code: CSC – 202A Advanced Data and File Structure

L – T – P
3 -- --

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit I

Graphs: Representation of Graphs in Memory, Traversing of Graphs, Binary Tree, Storage Representation, Tree Traversal, Binary Search Tree, Searching & Inserting in BST

Unit II

Introduction to Files: Types of Files (According to function, Access mode), files Operations, file System, Storage devices, Magnates tape (Blocking & De –Blocking), tape utilization, Size of Block, Application Areas of Magnetic tape, Advantage & Disadvantage of tape, Timing Determination, Magnetic Disk (Access time, Advantage & Disadvantages), floppy disk, Comparison between different Storage Devices

Unit III

File Organization: Types of File Organization :Serial Sequential, Direct, (ISAM) Indexed sequential AccessMethod) ,Hashing algorithm, Collision & Synonym., Choice of file organization Methods.

Unit IV

Concepts of index, Levels of index, Multi Key Access, Inverted File Organization, Multi list Organization

Suggested Readings:

1. Lipschutz: Data Structures (Schaum's Outline Series), Tata McGraw-Hill.
2. Adam Drozdek: Data Structures and Algorithms in C++, Vikas Pub. House (Thmpson), New Delhi.
3. Gupta Amit: Data Structures Through C, Galgotia Booksource Pvt. Ltd., New Delhi.
4. Sofat S.: Data Structures With C and C++, Khanna Book Pub. Co.(P) Ltd, N. Delhi.

5. Dromey R.G: How to Solve it by Computer ?, Prentice Hall India.

6. Loomis: Data Structure and File Management, Prentice-Hall India Ltd.

7. Tannenbaum: Data Structure Using C, Tata McGraw-Hill.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

Paper Code: CSC – 202B **Object Oriented Programming with C++**

L – T – P
3 -- --

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit-I

Object Oriented Programming: Software evolution. Object oriented Languages and Applications.

Object oriented concepts: Class, Object, Abstraction, Inheritance, Polymorphism, Overriding, Abstract Class & methods. Generalization, Aggregation, Associations.

Unit-II

Introduction to Programming C++: Object-Oriented Features of C++, data types in C++, variables, operators, flow control, recursion, array, Pointers and their manipulation, strings, structures, Class and Objects, Data Hiding & Encapsulation, Data members and Member functions, Inline Functions ,Friend Functions, Comparing C with C++.

Unit- III

Inheritances: Single Inheritance, Multiple Inheritance, Hierarchical, Hybrid Inheritance, polymorphism, pointers, virtual functions, console I/O operations.

Unit- IV

Files: classes for file stream Operations-opening, closing and processing file, End of file detection, file pointers, updating a file, Error Handling during file Operations.

Suggested Readings:

1. Balagurusamy, E.: Object-Oriented Programming With C++, Tata McGraw-Hill.
2. Subburaj, R.: Object-Oriented Programming With C++, Vikas Pub. House, New Delhi.
3. Rumbaugh, J. et. al.: Object-Oriented Modelling and Design, Prentice Hall of India.
4. Booch, Grady: Object-Oriented Analysis & Design, Addison Wesley.
5. Chndra, B.: Object Oriented Programming Using C++, Narosa Pub. House, New Delhi.
6. Stroustrup, B.: The C++ Programming Language, Addison-Wesley.
7. Lippman: C++ Primer, 3/e, Addison-Wesley.
8. Schildt, Herbert: C++: The Complete Reference, 2/e, Tata McGraw-Hill

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

Paper Code: CSP – 202 OOPS Using "C++" ~~Practical~~ Lab

L – T – P
- -- - 4
Time-3Hrs
External Marks: 40
Internal Marks: 10

Total Credits: 02
Total Marks: 50

Note: Practical (OOPS Using "C++" Language)

Internal Assessment Marks (For Theory Papers)

Sr.No.	Criteria	Marks
1	One mid term exam	5
2	Seminar/Assignment	2.5
3	Attendance	2.5
	Total	10

Internal Assessment Marks (For Practical)

Sr.No.	Criteria	Marks
1	Practical Sheet/Program Execution	5
2	Practical File/Viva-Voce	2.5
3	Lab Attendance	2.5
Total		10

26/10/15

26/10/15

26/X/15

26/10/15

01/03/2019

5th Semester

Paper Code: CSC – 301A **Data Base Management System**

L – T – P
3 -- --

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Basic Concepts – Data, Information, Records and files. Traditional file – based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions, Advantages and Disadvantages of DBMS. Classification of Database Management System. Roles in the Database Environment - Data and Database Administrator.

UNIT – II

Centralized and Client Server architecture to DBMS. Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances. Data Independence – Logical and Physical Data Independence. Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling. Hierarchical, network and Relational model

UNIT – III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes and keys, Relationship, relationship sets, Role name & recursive relationship and structural constraints, Conceptual design using E-R Diagrams. Relational Data Model:-Introduction, Properties of Relations, Keys, Integrity Constraints over Relations, Views. Relational Database Design: Functional Dependencies, Normalization: 1st to 3rd Normal Form, BCNF, Lossless Join and Dependency preserving decomposition.

UNIT – IV

SQL: Types & components of SQL, Data Definition and data types, Data definition commands, Data manipulation commands, Data Control Commands Specifying Constraints(Primary Constraint,. Foreign key, Unique, Not Null) in SQL, Schema, Basic Queries in SQL, Insert, Delete and Update operations. Inbuilt Date, String functions. Commit, Rollback, Save points. Views: Introduction, Advantages of creating views, Features, Destroying/ Altering table & Views.

Suggested Readings:

1. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.
2. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
3. C. J. Date, "An Introduction to Database Systems", 8th edition, Addison Wesley N. Delhi.
4. Raghurama Krishnan:Database Management Systems, Johannes Gehrke, TMH.
5. Siberschatz,Korth: Database System Concepts, McGRaw Hill, latest Edition

6.C.J Date: An Introduction to Date base Systems. Vol & II, Addison Wesley,
J.D Ullman, Principal of Date base systems, Golgotha, New Delhi.
. Wiederhold, Date base Design, Mc Grew Hill
9.R. Elmasri, and S.B. Nava the, Fundamentals of database Systems, Pearson Education Asia.
10.R Ramakrishna. J. Gemke, Date base Management Systems, Mc Graw-Hill

Note: atest and additional good books may be suggested and added from time to time, covering the syllabu

Paper Code: CSC – 301B **Operating System**

L – T – P
3 -- --

Total Credits: 03
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT- I

Introduction: Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems, types of Operating System: Real time, Multiprogramming, Multiprocessing, Batch processing, O/S service system calls, system programs.

UNIT – II

Process management: Process concepts, operations on processes, Process states and Process Control Block. CPU Scheduling: Scheduling criteria, Levels of Scheduling, Scheduling algorithms, Multiple processor scheduling. Deadlocks: Deadlock characterization, Deadlock prevention and avoidance.

UNIT – III

Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, Inter-process Communications. Storage Management: memory management of single-user and multi-user operating system, partitioning, swapping, paging and segmentation, Thrashing.

UNIT-IV

Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, segmentation
File management: File Systems: Functions of the system, File access methods, allocation methods Contiguous, allocation, linked, indexed allocation.

Suggested Readings:

1. Deitel, H.M., "Operating Systems", Addison- Wesley Publishing Company, New York.

2 Tanenbaum, A.S., "Operating System- Design and Implementation", Prentice Hall of India, New Delhi.

3. Silberschatz A., Galvin P.B.,and Gagne G., "Operating System Concepts", John Wiley & Sons, Inc.,New York.

4. Godbole, A.S., "Operating Systems", Tata McGraw-Hill Publishing Company, New Delhi.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

Paper Code: CSP – 301 **Data Base Management System ~~Practical~~ Lab**

L – T – P Total Credits: 02

-- -- 4 Total Marks: 50

Time-3Hrs

External Marks: 40

Internal Marks: 10

Note: Practical (Oracle and sql queries)

Internal Assessment Marks (For Theory Papers)

Sr.No.	Criteria	Marks
1	One mid term exam	5
2	Seminar/Assignment	2.5
3	Attendance	2.5
	Total	**10**

Internal Assessment Marks (For Practical)

Sr.No.	Criteria	Marks
1	Practical Sheet/Program Execution	5
2	Practical File/Viva-Voce	2.5
3	Lab Attendance	2.5
Total		**10**

6th Semester

Paper Code: CSC – 302A

Visual Basic Programming

L – T – P
3 -- --

Total Credits: 3
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit I

Introduction to VB: Visual & Non-visual programming, Procedural, Object-oriented and event- driven Programming languages, The VB environment: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window. Event driven programming..

Unit II

Textboxes, command buttons, frames, check Boxes, Option Buttons, Images, Setting a Border & Styles, the Shape Control, The line Control, Working with multiple controls and their properties. Designing the user Interface, Keyboard access, Val function

Unit III

Basics of Programming: Variables: Declaration, Types of variables, Converting variables types, User defined data types, Scope & lifetime of variables. Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators. I/O in VB: Various controls for I/O in VB, Message box, , Input Box, Print statement.

Unit IV

Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case. Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures. Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array.

Suggested Readings:

(1) Programming in VB 6 by Julia case Bradley, Anita C, Millspaugh, TMH

(2) Visual Basic 6.0 Programming by Content Development Group, TMH

(3) The Complete Reference Visual basic 6 by Noel Jerke, TMH

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

28/10/15

28/10/15

01/03/2019

Paper Code: CSC – 302B **Software Engineering**

L – T – P
3 -- --

Total Credits: 3
External Marks: 40
Internal Marks: 10

Time-3Hrs

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 4 parts (short-answer type questions) covering the entire syllabus and will carry 8 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 8 marks. Student will be required to attempt FIVE questions in all.Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit 1

Software and software engineering:: Software characteristics, Software Processes, software crisis, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models, software engineering paradigms, goals and principles of software engineering.

Unit 2

Software requirement analysis – Structured analysis, object-oriented analysis and data modeling, software requirement specification, validation.
Software requirements Analysis and Specifications: Requirement engineering, requirements analysis using DFD, Data Dictionaries and E-R Diagram, requirement documentation, nature of SRS, characteristics and organization of SRS.

Unit3

Size Metrics, Function point analysis, phases process models, Software process, Software Quality , role of metrics & measurement.

Cost estimation COCOMO model, Project Scheduling Software Quality Assurance, Project monitoring plans

Unit 4

Design and implementation of software- Software design fundamentals, software design principles, Cohesion and Coupling, Classification of Cohesion and Coupling, Function oriented design, object oriented Design, design verification, monitoring and control..

Concept of Software reliability & Availability. Safety of the software, Error, Fault & Failure of software Reliability Models & limitations.

Suggested Readings:

1) Software Engineering By Nasib Singh Gill, Khanna Publication
2) Software Engg:- Metrics, testing and faults, Rajender Singh Chhillar, Excel Books new Delhi.
3) Software Engg:- Roger, S, Pressman, Mc-Graw hill
4) An Integrated Approach to Software Engg. Pankaj Jolote. Narose

5) Software Runaways, Glass, R.L. Prentice Hall
6) Risk Management Economics Bohem B.IEEE Computer Society Press.
7) Software Engineering Economics Bohem B.IEEE Computer Society Press.
8) Software Engineering By Sommerville.

Note: Latest and additional good books may be suggested and added from time to time, covering the syllabus.

26/10/15

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26/10/15

11/03/2019

Paper Code: CSP – 302 VB ~~Practical~~ Lab
L – T – P
-- -- 4
Time-3Hrs
External Marks: 40
Internal Marks: 10

Total Credits: 2
Total Marks: 50

Note: Practical (Visual Basic Programming)

Internal Assessment Marks (For Theory Papers)

Sr.No.	Criteria	Marks
1	One mid term exam	5
2	Seminar/Assignment	2.5
3	Attendance	2.5
	Total	**10**

Internal Assessment Marks (For Practical)

Sr.No.	Criteria	Marks
1	Practical Sheet/Program Execution	5
2	Practical File/Viva-Voce	2.5
3	Lab Attendance	2.5
Total		**10**

26/10/15

26/10/15

01/03/2019

2261
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Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(1st Semester)
ZOOLOGY

Paper Code: ZOO – 101B Bio Chemistry and Cell Biology

L – T – P
3 -- --
External Marks: 40
Internal Marks: 10

Total Credits:03
Total Marks: 50

Unit-I

Bio Chemistry:- Introduction, Classification, Structure, Function and General properties of various biomolicules.

Biomolecules	:	Proteins, Carbohydrates, Lipids
Enzymes	:	Nomenclature, classification and mechanism of enzyme action

Unit-II

Vitamins	:	Name, Source and Function
Hormones action.	:	Chemical nature and function, and mechanism of

Unit-III

Cell Biology:-

Immunology:- Overview of immune system, cells of immune system and organs, innate and acquired immunity, Generation of immunogenicity, recognition of antigens of B-cell epitops, Antigen – Antibody interactions, immune system in health and disease,

Unit-IV

Cancer Biology:- Types of Cancer, An elementary idea of cell transformation in cancer, Types of tumors, Therapy of cancer

Structural and functional components eukaryotes, polytene and lampbrush chromosome.

Golgi bodies, centrosomes, structure of cilia and flagillae.

Suggested Books:-

1 De Robertis, E.D.P., De Robertis, E.M.F., Cell Biology and Molecular Biology, 8th ed. , W.B. Saunders Co., Philadelhia,1995.
2 Rechard, A.G. Kidt, T.J. Osborme, B.A. and Rodwell, V.W., 2003. Immunology, W. H. Freeman and Co. New York.
3 Roitt. T.M. Essential Immunology. Blackwell Scientific Publications. 2001.

Kant 1/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(1st Semester)
ZOOLOGY

Paper Code: ZOP 101 **Practical**

L – T – P
-- -- 4

Total Credits:02
Total Marks: 50

External Marks: 40
Internal Marks: 10

1. **Classification up to orders with ecological notes and economic importance of the following animals.**

(1) A . Protozoa:
(a) Examination of eluters of Amoeba *Euglena* and *Paramecium.*
(b) **Permanent Slides :** *Amoeba, Euglena, Trypnosoma, Noctiluca, Ememeria, Monocystis, Paramicium* (Binary fission and conjugation) *Opalina, Vorticella, Blantidium, Nictotherus* and *Polytomella.*

B. Parazoa:
(a) **Specimens :** *Sycon, Grantia, Euplectella, Hylonema, Spongilla and Euspongia.*
(b) **Permanent Slides :** T.S.*Sycon*, L.S. of *Sycon*

C . Coelenterata:
(a) **Specimens:** *Porpita, Velella, Physalia, Aurelia, Rhizostoma, Metridium, Millipora and Alcyonium, Tubipora, Zoanthus, Medrepora, Favia, Fungia and Astrea.*

(b) **Permanent Slides :** *Hydra* with buds, *Obelia* (colony and medusa), *Sertularia, Plumularia, Bouganvillea*

D. Platyhelminthies:
(a) **Specimens:** *Dugesia, Faciola, Taenea* and *Echinococcus.*

(b) **Permanent Slides:** Miracidium, Sorocyst, Redia, Cercaria larva of *Fasciola,* Scolex and Proglotids of *Taenia* (mature and gravid).

E. Aschelminthes:
(a) **Specimens:** *Ascaris* (male and female), *Trichinella*, *Ancylostoma Meloidogyne.*

(b) **Permanent Slides:** T.S. of *Ascaris* (male and female).

F. Annelida:

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(a) **Specimens:** *Pheritima, Nareis, Hetronereis, Polynoe, Aphrodite, Tubifix Arenicola* and *Potobdella.*

(b) **Permanent Slides :** T.S. of earthworm through pharynx, gizzard, seminal vesicles, prostate Glands and typhlosol, intestine of earthworm and T.S. of Leech through pharynx.

2. **Dissection of Leech** Demonstruction of - Digestive , Reproductive and nervous systems.
3. Temporary and permanent slide formation (staining and mounting) and identification of class working material –
   (a) Gemmules, Spicules and Sponginfibers of Sponge.
   (b) *Euglena, Hydra, Obelia, Plumularia, Sertularia. Bougainvillea* etc.
4. Biochemical test for Sugar, Protein and Fat.
5. Test of Salivary amylase activity : Effect of temperature, PH, Concentration.
6. Estimation of abnormal constituents of Urine (Albumin, Sugar, Ketonebodies)

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Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(2nd Semester)
ZOOLOGY

Paper Code: ZOO-102A Animal Diversity Non Chordata-11
(Arthropoda to Hemichordata)

Total Credits:03
Total Marks: 50

External Marks: 40
Internal Marks: 10

Unit- I

General character and classification up to orders with examples.

Arthropod : Periplaneta (cockroach), Prawn, Social Organizations in insects (honey bee and termite), life cycle of Anopheles and Culex and economic importance of insects.

Unit-II

Mollusca : Type study - Pila
Torsion and Detorsion in Gastopoda

Unit- III

General character and classification upto orders with examples.

Echinodermata : Asterias (Starfish), Larval forms in Echinodermata, Phylogeny and Affinities of Echinoderms.

Unit-IV

Hermichordata : Balanoglossus, Habitat an Habits External Characters Bodywall, Coelom skeleton Various Systems and affinities.
Aristotale's Lantern

Suggested Books:-

Dhami,P.S. and Dhami, J.K., Invertebrates, R. Chand and Co., New Delhi, 2001.
Barnes, R.D. Invertebrates Zoology, W.B. Saunders, Philadelphia, 1999.

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3193
M-18

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(2nd Semester)
ZOOLOGY

Paper Code: ZOO-102B **Ecology**

Total Credits:03
Total Marks: 50

External Marks: 40
Internal Marks: 10

Unit- I

Ecology	:	Definition, Significance, Concept of habitat and ecological Niche, Subdivisions and scope of ecology.
Ecosystem	:	Components, ecological energetic, food web, introduction to major ecosystems of the world.

Unit-II

Ecological factors	:	Abiotic factors (Temperature, light and soil as ecological factors), Distribution of animals based on ecological factors.
Biotic Community	:	Characteristics,. Ecological succession.
Nutrients Cycle	:	Biogeochemical cycles & concept of limiting factors..

Unit – III

Ecological adaptations	:	Morphological , physiological and behavioral adaptations In animals in different habitats
Population	:	Characteristics, Growth and regulation of population. Migration in fishes and birds, Parental care in Animals. Inter and intraspecific relationship – Competition, Predation, Parasitism, Commensalisms and Mutualism

Unit-IV

Natural resources	:	Renewable and nonrenewable natural resources Conservations.
Environmental Pollution	:	Causes, impact and control of environmental pollution (Air water, soil, Plastic and noise), Environmental degradation.

Suggested Book :

1. Kormondy, E.J., Concepts of Ecology, Englewood Cliffs, N.J., Prentice Hall Inc., 1975.
2. Kreb, C.J., Ecology, Harper & Row, New York, 1982.
3. Odum, E.P., Fundamentals of Ecology W.B. Saunders Co., Philadelphia, 1995.
4. Dhami, P.S. & Dhami, J.K. , Invertebrates, R. Chand & Co., New Delhi, 2001

Kant 01/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(2nd Semester)
ZOOLOGY

Paper Code: ZOP-102 **Practical**

L – T – P
-- -- 4
External Marks: 40
Internal Marks: 10

Total Credits:02
Total Marks: 50

1. **A Arthropoda** : *Periapts Palaemon* (Prawn),*lobster Cancer* (crab) , *Sacculina*, *Eupagurus* (Hermit crab) *Lepas* ,*Balanus, Cyclops, Daphnia, Lepisma, Periplaneta* (Cockroach), *Schistocerca* (Locust) *Poecilocerus* (Ak grasshopper), *Gryllus* (Cricket), *Mantis* (Pryingmantis) *Cicada, Forjicula* (Earwig), Dragonfly, termite queen, bug,moth, beetle, *Polistes* (Wasp), *Apis* (honey bee), *Bombyx, Pediculus* (Body louse), *Millipede and Centipede*, *Palamnaeus* (Scorpion), *Aranea* (Spider) and *Limulus* (King crab).

   B. Mollusca : *Mytilus, Ostrea, Cardium, Pholas, Solen* (Razor fish), *Pecten, Haliotis, Patella, Aplysia, Doris, Limax, Loigo, Sepia, Octopus, Nautilus* shell (Complete andT.S.),*Chiton* and *Dentalium*.

   C. Echinodermata : *Asterias, Echinus, Ophiothrix* and *Antedon cucumaria, Asterophyton.*

   D. Hemichordata : *Balanoglossus.*

2. Study of the following permanent stained preparations:
   a. Insect trachea, Mouth parts of *Periplaneta* (Cockroach).
   b. Radula and osphradium of *Pila.*
   c. T.S. Starfish (Arm).
   d. T.S. *Balanoglossus* (Through various regions).

3. Preparation of the following slides:
   a. Temporary preparation of Slide of Mouth parts and trachea of Grasshopper,
   b. Radula and osphradium of *Pila.*
   c. Pedicillarae of *Asterias.*

4. Dissections of the following animals:
   a. *Periplanenta* / Grass Hopper : Digestive system, mouth parts and trachea.
   b. *Pila* : Pallial complex, digestive and nervous systems.(Demonstration only)

5. **ECOLOGY**
   a. Study of animal adaptations with the help of specimens, charts and model.

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b. Study of Zoogeographical regions and their fauna.
c. Study of biotic components of an ecosystem (pond ecosystem, artificial ecosystem i.e. grassland, cropland).
d. Study of different types of nests in birds, different type of beak & feet of various birds.
e. Study & preparation of zoogeographical charts.

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D-18

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(3rd Semester)
ZOOLOGY

Paper Code: ZOO-201A **Animal Diversity Chordata-1 (Protochordate to Amphibia)**

L – T – P
3 -- --
External Marks: 40
Internal Marks: 10

Total Credits:03
Total Marks: 50

Unit- I

Chordate : General characters and classification up to order level with examples.

Origin and evolutionary tree of chordates.

Protochordates : Systematic position, distribution, ecology, Morphology & Anatomy, Affinities
Type study of *Herdmania* (Urocordate).

Unit-II

Amphioxus (Cephalochordate).

Cyclostomes : Type study of *Petromyzone.*

Unit- III

Chordate : General characters and classification up to order level with examples.

Pisces : Type study of *Labeo*
Scales & fins of fishes, Parental care in fishes, Fish migration.

Unit-IV

Amphibia : Type study of frog (*Rana Tigrina*).

Suggested Books:-

1. Colbert, E.H., Evolution of vertebrates, II Edition Wiley Ltd. 1989.
2. Dhami,P.S. and Dhami, J.K., Vertebrates, R. Chand and Co., New Delhi, 1997.
3. Kotpal's vertebrates.

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Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(3rd Semester)
ZOOLOGY

Paper Code: ZOO-201B Developmental biology and Evolution

L – T – P
3 -- --
External Marks: 40
Internal Marks: 10

Total Credits:03
Total Marks: 50

Unit- I

.Developmental biology

Historical perspectives, aims and scope of developmental biology.
Generalize structure of mammalian ovum & sperm/ spermatogenesis and oogenesis, fertilization, parthenogenesis, different types of eggs and patterns of cleavage.
Process of blastulation and fate-map construction in chick.

Unit-II

Gastrulation in chick upto the formation of three germinal layers.
Elementary knowledge of primary organizer.
Concepts of competence, determination of differentiation.
Extra embryonic membranes and regeneration.

Unit II

Evolution ; Origin of life.
Concept and evidences of organic evolution.
Theories` of organic evolution: Lamarckism, Darwinism, Neo- Darwinism,

Unit-IV

De' Varies mutation theory, Modern theory of evolution .
Concept of micro-evolution, macro-evolution and mega-evolution. Concepts of species, Modes of speciation.
Evolution of man.

Suggested Book:

1. Dobzhansky, Ayala, Stebbins & valentine, Evolution, W.H. Freeman , 1952.
2. Colbert, E.H., Evolution of Vertebrates, II Edition Wily Easten Ltd .,1989
3. Bhamrah, H.S. Juneka, K., Cytogenetics & Evolution, Anmol Publication Pvt.Ltd . 1993.
4. Davenport. An out line of Animal Development Addisom-Wesly.

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5. Gilbert, S.F. (1991) Developmental Biology. Sinaurer AssociatesInc Publishers.
6. Oppenheimor, S.B.(1981) Insoduction to Embryology, Allyn and Baeon. Sussman Animal Growth and Developmental Prentiahall.

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(3rd Semester)
ZOOLOGY

Paper Code: ZOP-201 **Practical**

L – T – P
-- -- 4

Total Credits:02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Protochordata	:	*Branchiostoma, balanoglossus, Herdmania* and a colonial *Urochordata*
Fishes	:	*Petromyzone pristis, Zygarna, Opiocephalus Clarius. Labeo, Mystis, Anguila, Syngnathus, Hippocampus, Tetradon, Ostacodon, Solea, Exocoetus.*
Amphibia	:	*Salamender , Necturus, Hyla, Raeophorus, Bufo,* limbless amphibian.
Skeleton	:	*Labeo* and Frog.
Temporary mounts	:	Placoid, cycloid and ctenoid scales . Wheel organ of *amphioxus.*
Dissection	:	*Hedrmania*: General Anatomy (Demonstration only) *Labeo*: Digestive System, Reproductive system and Excretory System.
Slides	:	Study of permanent slides of WM of chick and frog embryo (13-18h, 24-36h, 36-48h, 48-72h) Window preparation and identification of development in chick egg.
Project	:	Based on theory papers.

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Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(4th Semester)
ZOOLOGY

Paper Code: ZOO-202A Animal Diversity Chordata-11
(Reptilia to Mammals)

Total Credits:03
Total Marks: 50

External Marks: 40
Internal Marks: 10

Unit-I

Chordate : General characters and classification up to order level with examples.

Reptilia :
1. Type Study of Lizard (*Hemidactylus*).
2. Origin, Evolutionary tree, Extinct reptiles.
3. Poisionous and Non Poisionous Snakes, Poision Appratus in Snakes.

Unit-II

Aves : Type study of Pigeon (*Columba Livia*), Flight Adaptations, Airodynamics in birds, feathers, migration in birds.

Unit-III

Chordate : General characters and classification up to order level with examples.

. Mammals : Type Study of Rat. (Includes detailed study of various systems of The animal)

Unit-IV

Skin and its derivatives, Dentition, Stomach and Adaptive radiation.

Suggested Books:-

4. Dhami,P.S. and Dhami, J.K., Vertebrates, R. Chand and Co., New Delhi, 1997.
5. Parker,T.J. and Haswell, W.A. Text Book of Zoology, Vol.II (vertebrates) ELBS and Macmillan Press Ltd. 1981.

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Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(4th Semester)
ZOOLOGY

Paper Code: ZOO-202B **Physiology**

L – T – P
3 -- --
External Marks: 40
Internal Marks: 10

Total Credits:03
Total Marks: 50

Unit-I

Digestion : Nutritional components: Proteins, carbohydrates, fats, lipids, vitamins and minerals. Types of nutrition and feeding. Digestion and dietary constituents, viz, lipids, proteins, carbohydrates and nucleic acids. Symbiotic digestion. Absorption of nutrients and assimilation. Control of enzyme secretion.

Unit-II

Circulation : Origin, Conduction and regulation of heart beat, Cardiac cycle, Electrocardiogram, Cardiac output, Fluid pressure and flow pressure in closed and open circulatory system, Composition and functions of blood and lymph. Mechanism of coagulation factors, anticoagulants, Haemopoiesis.

Unit-III

Control and Coordination: Nervous integration and chemical integration of endocrinology, Nature, origin and propagation of nerve impulse, Structure and mechanism of hormone action, Physiology of Pituitary, Thyroid, Parathyroid, Adrenal, Pancreas and Gonads.

Respiration : Exchange of respiratory gases, Transport of gases, lung air volumes, Oxygen dissociation curve of Haemoglobin. Bohr's effect.Hamburger's phenomenon(Chloride shift), control of respiration.

Unit-IV

Excreation : Patterns of excretory products viz., Ammonotelic, ureotelic and uricotelic , Ornithin cycle (Kreb's- Hanseleit cycle) for urea formation in liver. Urine formation, counter-current mechanism of urine concentration, osmoregulation, Micturition.

Reproduction : Gametogenesis, Structure of Gametes, Ovulation, Capicitation, Fertilization, gestation and parturition.

Suggested Books:-

Kaul 01/03/19

1. Taneja, S.K., Biochemistry & animal phsiology, Truman Book Co., 1997.
2. Guyton, A.S., Text Book of Medical Physiology, 7th ed., W.B. Saunders.
3. Marub, A. Human Anatomy and Physiology. The Benjamin Cumming publishing Company, California.

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(4th Semester)
ZOOLOGY

Paper Code: ZOP-202 **Practical**

L – T – P
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Total Credits:02
Total Marks: 50

External Marks: 40
Internal Marks: 10

General characters and classification up to orders with examples. (Reptilia to mammalia)

Reptila Specimen : *Chelone, Testudo, Trionyx, Hemidactylus, Calots, Varanus, Uromastix, Ophiosaurus, Chamaeleon, Draco,Python, Eryx, Natrix, Ptyas, Dendrelaphi, Bungarus, Naja, Hydrus Enhydrina, Viper* and *Crocodilus*.

Aves Specimen :Casuarius, Arden, Anas, Milvis, Pavo, Eudynamis, Tyto, Alerdo and Halcyon. Temporary mounts-barbs, Study of a dozen common birds of Haryana, types of feathers .

Mammalia Specimen : Study of *Ornithorhynchus, Pteropus*, *Echidna, Dedelphis Pteropus, Macropus ,cannis, Loris, Oryctolagus, Funambulus* and *Herpestes Capra,* Cat, langur, *macacca*, hedgehog, shrew, insectivorous bat,

Osteology - :Disarticulated skeleton of fowl; different types of palate in birds.Disarticulated skeleton of *Varanus*, skull lower jaw, carapace and Plastron of tortoise. Rabbit and Human skull.

Dietary Adaptation- Frugivorous bat , squirrel and mongoose.

Dissections - Arterial, venous and Urinogenital systems, Neck region, rar ossicles and brain of white rat. (Demonstration only)

Permanent Slides :-

Mammalian skin, salivary glands, oesophagus, stomach, duodenum, ileum, rectum, liver, pancreas; spleen, trachea , lung, kidney, cartilage, bone, pituitary, adrenal, thyroid, Parathyroid, ovary and testis.

2. Report on field trip to Zoological Park, National Museum of Natural History or a Wildlife sanctuary/national park.
3. Effects of isotonic, hypotonic and hypertonic solution on erythrocytes.

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4. Enumeration of red blood cells using haemocytometer
5. Enumeration of the total and different types of white blood cells
6. Estimation of hemoglobin content of blood using Sahli's haemometer.
7. Preparation of haemin crystals.
8. Demonstration of the knee jerk reflex.
9. Recording of blood pressure using a sphygmomanometer.

Kant 01/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(5th Semester)
ZOOLOGY

Paper Code: ZOO-301A **Economic Zoology-I**

L – T – P
3 -- --
External Marks: 40
Internal Marks: 10

Total Credits:03
Total Marks: 50

Unit- I

Study of importance of insect pests of crops and vegetable crops:

1. **Sugarcane :**
   a) Sugarcane leaf hopper (*Pyrilla perpusilla*)
   b) Sugarcance whitefly (*Aleruolobus barodensis*)
   c) Sugarcance top borer (*Scirpophaga nivella*)
   d) Sugarcance root borer(*Emalocera depresella*)
   e) Gurudaspur boror (*Bissetia Steniellus*)

   With their systemic position, habit and nature of damage caused. Life cycle and control of *Pyrilla. Perpusilla* only.

2. **Cotton :**
   a) Pink bollworm (*pectinophora gossypiela*)
   b) Red cotton bug (*Dysdercus koenigii*)
   c) Cotton grew weevil (*Myllocerus undercimpustulatus*)
   d) Cotton jessed (*Empoasca devastans*)

   With their systemic position. habits and nature of damage caused. Life cycle of control of *pectinophora gossypiella*.

3. **Wheat :**
   Wheat stem borer (*Sesamia inferens*) with systemic position, habit, and nature of damage caused Life cycle of & control.

4. **Paddy :**
   a) Gundhy bug (*Leptocorisa varicornus*)
   b) Rice grasshopper (*Hieroglyphus banian*)
   c) Rice stem borer (*Scirpophaga incertullus*)
   d) Rice hipsa (*Hispa armigera*)

   With their systemic position, habits and nature of damage caused. Life cycle and control of *leptocorisa varicornus*.

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Unit- II

1. **Vegetables pests :**

   a) *Raphidopalpa faveicollis* - The red pumpkin beetle.
   b) *Dacus cucurbitas* - The red pumpkin fruit fly.
   c) *Tetarnychus tecarius* - The vegetable mite.
   d) *Epilachna* - The Hadda beetle
   With their systemic position, habits and nature of damage caused.
   Life cycle & control of *Aulacophora faveicollis*

2. **Pests of stored grains:**
   a) Pulse beetle (*Callosobruchus maculates*)
   b) Rice weevil (*Sitophilus oryzae*)
   c) Wheat weevil (*Trogoderma granarium*)
   d) Lesser grain borer (*Rhizopertha dominica*)
   e) Grain and flour moth (*Sitotroga cerealell*)

Unit-III

3. **Pest Control:**
   i) Physical Control
   ii) Chemical Control : History, categories of pesticides, from each category of pest against which they can used, Insect repellent and attractant.
   iii) Biological Control : History, requirement and precautions and Feasibility of biological agents for control.
   iv) Hormonal Control : History, requirement and precautions and Feasibility of biological agents for control.
   v) Legal Control.
   vi) Integrated Pest Management.

Unit-IV

Some Useful Insects :

Their systemic position, life cycles & their uses.
(honey bee, lac insect, silk moth etc.)

Suggested books :

1. Perry A.S Yamamoto, I.I shaay and R.Perry , Inseetides in Agriculture and Environment-Narora Publishing House.
2. B.S Parmer & S.S Tomar Pesctides formulation CBS Publishers and distributors, New Delhi .
3. R.Wade, M.Dekker, Pesticide Formulation.
4. G. Shukla G.S Upadhay Economic Zoology .V.B Rastogi publications Meerut.

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Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(5th Semester)
ZOOLOGY

Paper Code: ZOO-301B **Genetics**

L – T – P
3 -- --
External Marks: 40
Internal Marks: 10

Total Credits:03
Total Marks: 50

Unit- I

DNA as Information :
Discovery of Gene
Structure of Gene
Mapping of gene
Translation
Transcription
DNA Replication

Unit-II

Recombination in bacteria (Conjugation, transformation and transduction).

Mutation :
Spontaneous & induced mutations, gene mutations, physical and chemical basis of mutations, transversion, structural chromosomal aberrations .

Unit III

Human genetics :
Human karyotype, Chromosomal abnormalities involving autosomes and sex chromosomes, Monozygotic twins, Sex determination, Inborn errors of metabolism.

Unit-IV

Eugenics, euthenics & euphenics :
Genetic counseling, Pre-natal diagnostics, DNA-finger printing, transgenic animals.

Population Genetics: Hardy-Weinberg equilibrium, Role of Migration, mutation & genetic drift in altering gene frequency.

Suggested Books :

1. Benjamen P.A.B. (2002) Genetics : A conceptual Approach, W.H. Freeman and Co. New York.
2. Brown, T.A. Genome : John Wiley & Sons (Asia) PTE Ltd.
3. Russel, P.J. (1998) Genetics : The Benjamin Cummings Publishing cone . Inc.
4. Benjamen Lewin, Gene Oxford.

Kanj 01/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(5th Semester)
ZOOLOGY

Paper Code: ZOP-301 **Practical**

L – T – P
- -- - 4

Total Credits:02
Total Marks: 50

External Marks: 40
Internal Marks: 10

1. **External morphology, identification marks, nature of damage & host of the following pests;-**

   i) **Sugarcane :** Sugarcans leaf hopper, sugar cans whitefly, sugarcane top borer, sugarcane root borer, Gurdaspur borer.
   ii) **Cotton :** red cotton bug.
   iii) **Wheat :** Wheat stem borer
   iv) **Paddy :** Gundhi bug, rice grasshopper, rice stem borer, rice hispa.
   v) **Vegetable:** *Aulocophora faviecollis*, Dacus cucurbitas, Tetranychus tecarious, Epilachna (Any three).
   vi) **Pest of stored grains:** Pulse beetle, Rice weevil, Grain & flour moth fust Red flour bettle, lessor grain borer (Any three).

2. Stages of life history of silk moth & honey bee.

3. Demonstration of law of segregation, Independent assortment & epistasis. Numerical for segregation & Independent assortment .

4. Segregation demonstration in preserved material.

5. Inheritance of other human characteristics, ability to taste PTC, thiourea.

6. Study of polytene chromosomes of *Chironomus/ Drossophila* through permanent slide .

7. Dermatographics: Plam print taking & finger tip patterns.

8. Collection & Identification of Pests.

01/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(6th Semester)
ZOOLOGY

Paper Code: ZOO-302A Economic Zoology-II

L – T – P
3 -- --

Total Credits:03
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting two questions from each unit. Question number 1 is compulsory (short answer type). Nine questions are to be set, spread over the entire syllabus.

Unit- I

Aquaculture :

Introduction to world Fisheries
Fresh water fishes of India.
River System, Reservoir, Pond/ Tank fisheries, captive and culture fisheries, Cold water fisheries.
Fishing crafts & gears.

Unit-II

Seed production.
Fish Feed.
Fish Culture technology.
Composite Culture& Monoculture.
Fin Fish, Crustaceans, Molluscs and their culture.

Unit- III

Poultry Culture :

Introduction, Habitat, Houses, Food & Feeding of fowl.
Breeds of fowl.
Precautions for Hatching, rearing of chicken.
Poultry Products.

Unit-IV

3 **Piggery :**

i) Introduction, Habitat, Houses, Food & Feeding .
ii) Breeds.
iii) Products.

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Suggested Books:-

1. Jhingran V.G:- Fish and fisheries of India, Hindustan publishing corporation of India , Delhi 1991.
2. Fishes of India vols . I & II :-Frances Days , Reprinted Edition Jagmander Book Agency, New Delhi 1994.
3. Johal M.S & K.L:- Monograph on the Fishes of Reorganized Panjab, Pb Fisheris Bulletin, vol. I& II,1980.
4. Agarwal S.C & Johal M.S:- Fishery Development, Narendra Publishing House, Delhi 1907.
5. Johal M.S & Tandon K.K. :- Fishes of Punjab, Res, Bull, Panjab Universety vol . 32.PP . 103-104 1981.
6. Karl f legler :- Freshwater fish ery Biology, wn c-Brown company Pub, Dubaque. Iowa, USA 1969.
7. Shukla G S and Upadhaya V. B: Economic Zoology Rastogi Publications Meerut.
8. Satnaragana, U. `Bioteehnology` Books and Allied CP, Ltd. Kolkata 7000 10 (India)
9. Brown T.D (1999) Gene cloning and DNA Analysis. Blackwall Sciena.
10. Powar C.B; Cell Biology; Himalayan Publishing house. Mumbai 400004.

01/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(6th Semester)
ZOOLOGY

Paper Code: ZOO-302B Biotechnology and Bioinformatics

L – T – P
3 -- --

Total Credits:03
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting two questions from each unit. Question number 1 is compulsory (short answer type). Nine questions are to be set, spread over the entire syllabus.

Unit-I

Definition, Scope & History of Biotechnology, Biotechnology tree, Structure of DNA & RNA.

Basic tools In Biotechnology:-

(i) Enzymes: Types of enzymes, Most commonly used enzyme
(ii) Vectors: Types of vector
(iii) Passenger DNA

Unit-II

Techniques in Biotechnology:- Agarose gel electrophrosis, Isolation and purification of nucleic acid, Isolation of Chromosomes, Nucleic acid blotting techniques, DNA Sequenceing, Alternate method of DNA Sequencing, Chemical Synthesis of DNA. Methods of gene transfer, Polymerase chain Reaction, Production of monoclonal antibodies,

Unit-III

Construction of gene library, Radiolabeling of nucleic acids, Cloning of DNA, Chimeric DNA ,Copying of messenger RNA into DNA.

4. Regulation of gene expression.

Unit-IV

Culture Technology & Bioinformatics

Animal cell culture, Tissue and organ cultures, *In vitro* Fertilization & Embryo Transfer, Transfection methods and transgenic animals, Cryopreservation.

Definition, components of Bioinformatics, Internet and Bioinformatics. Biological database and Application of Bioinformatics in drug designing. Use of Computer in the field of Zoology.

01/03/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2017
(6th Semester)
ZOOLOGY

Paper Code: ZOP-302 **Practical**

L – T – P
-- -- 4

Total Credits:02
Total Marks: 50

External Marks: 40
Internal Marks: 10

1. Identification of food Fish :
Catla ,Labiorohita, L. Calbasu , Cirrhina mrigala, Barbus Sarana, Ophlocephalus punctatus, O. Marulis, O. satiates, Trichogaster,, Mystus Seenghala, M. cavasius, M. tengara, Callichrous pabola,. C.bimaculatus & Wallago attu etc.
2. Other aquatic Animals used as food:-
Prawns, Crabs, Lobsters & Oysters etc.
3. Structure of Mouth of different fishes in relation to feeding habits.
4. A study of the fish parasites.
5. A study of different types of Nets. Egg net, Cast net, Gill net, Drift net & Drag net.
6. A visit to lake / Reservoir/ fish breeding center/ Poultry.
7. Histology : Preparation of permanent histological slides of testes, Ovary, Kidney, intestine, liver of rat. (Microtomy)
8. Demonstration of detailed structures of DNA & RNA Through model.
9. Fish Feed formulation
   - Artificial
   - Live-Culture, identify slide and preparation
10. Fish diseases- slides (infected fishes).
11. Biotechnological techniques.
12. Computer based experiments.

Kant 01/03/19

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Scheme of Examination for B.Sc. Medical

In the Subject of Botany

B.P.S.M.Vishwavidyalya, Khanpur Kalan

B.Sc. I

Semester -I									
S.No.	Paper		Paper Code	Marks Internal	External	Total Marks	Periods In hours	Credits	Exam Duration
1.	Paper-1	Diversity of microbes and cryptogams	BOT-101A	10	40	50	3	3	3hrs
2.	Paper-II	Cell Biology	BOT-101B	10	40	50	3	3	3hrs
3.	Paper-III	Practicals Based on Theory	BOP-101	10	40	50	4	2	4hrs
					Total -	150	Total -	8	-

Scheme of Examination for B.Sc. Medical

In the Subject of Botany

B.P.S.M.Vishwavidyalya, Khanpur Kalan

B.Sc. I

Semester -II									
S.No.	Paper		Paper Code	Marks Internal	External	Total Marks	Periods In hours	Credits	Exam Duration
1.	Paper-1	Diversity of Archegoniates (Bryophytes &Pteridophytes)	BOT-102A	10	40	50	3	3	3hrs
2.	Paper-II	Genetics	BOT-102B	10	40	50	3	3	3hrs
3.	Paper-III	Practicals Based on Theory	BOP-102	10	40	50	4	2	4hrs
					Total - 150		Total - 8		-

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Scheme of Examination for B.Sc. Medical

In the Subject of Botany

B.P.S.M.Vishwavidyalya, Khanpur Kalan

B.Sc. II

Semester -III									
S.No.	Paper		Paper Code	Marks Internal	External	Total Marks	Periods In hours	Credits	Exa Dur
1.	Paper-1	Diversity and Systematics of Seed Plants - I	BOT-201A	10	40	50	3	3	3hr
2.	Paper-II	Plant Anatomy	BOT-201B	10	40	50	3	3	3hr
3.	Paper-III	Practicals Based on Theory	BOP-201	10	40	50	4	2	4hr
					Total -	150	Total -	8	-

Scheme of Examination for B.Sc. Medical

In the Subject of Botany

B.P.S.M.Vishwavidyalya, Khanpur Kalan

B.Sc. II

Semester -IV									
S.No.	Paper		Paper Code	Marks Internal	External	Total Marks	Periods In hours	Credits	Exa Dur
1.	Paper-1	Diversity and Systematics of Seed Plants -II	BOT-202A	10	40	50	3	3	3hr
2.	Paper-II	Reproduction and Embryology in Flowering Plants	BOT-202B	10	40	50	3	3	3hr
3.	Paper-III	Practicals Based on Theory	BOP-202	10	40	50	4	4	4hr
					Total -	150	Total -	8	-

Scheme of Examination for B.Sc. Medical

In the Subject of Botany

B.P.S.M.Vishwavidyalya, Khanpur Kalan

B.Sc. III

Semester -V									
S.No.	Paper		Paper Code	Marks Internal	Marks External	Total Marks	Periods In hours	Credits	Exam Duration
1.	Paper-1	Plant Physiology	BOT-301A	10	40	50	3	3	3hrs
2.	Paper-II	Plant Biochemistry and Plant Biotechnology	BOT-301B	10	40	50	3	3	3hrs
3.	Paper-III	Practicals Based on Theory	BOP-301	10	40	50	4	2	4hrs
		Total - 150					Total - 8		-

Scheme of Examination for B.Sc. Medical

In the Subject of Botany

B.P.S.M.Vishwavidyalya, Khanpur Kalan

B.Sc. III

Semester -VI									
S.No.	Paper		Paper Code	Marks Internal	Marks External	Total Marks	Periods In hours	Credits	Exam Duration
1.	Paper-1	Plant Ecology	BOT-302A	10	40	50	3	3	3hrs
2.	Paper-II	Economic Botany	BOT-302B	10	40	50	3	3	3hrs
3.	Paper-III	Practicals Based on Theory	BOP-302	10	40	50	4	2	4hrs
		Total - 150					Total - 8		-

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Savina 2/9/15

Savina 1/3/19

Syllabus of B.Sc. (Medical)
W.e.f. July 2015
(1st Semester)
BOTANY

Paper Code: BOT– 101A

Diversity of Microbes and Cryptogams (Algae & Fungi)

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit- I

Bacteria- Structure, Nutrition Multiplication, and Economic Importance of bacteria, General account of Cyanobacteria.

Algae - General Characters, Classification and economic importance.

Unit- II

Algae- Important features and Life History of Chlorophyceae- *Volvox, Oedogonium, Chara,* Xanthophyceae- *Vaucheria,* Pheophyceae-*Ectocarpus.* Rhodophyceae- *Polysiphonia.*

Unit- III

Viruses - General account of Virus including structure of TMV and Bacteriophage.

Fungi- General Characters, Classification (up to classes) and economic importance.

Unit- IV

Fungi- Important Features and Life History of Mastigomycotina- (*Phytophthora*), Zygomycotina (*Mucor*), Ascomycotina (*Penicillium*) Basidiomycotina (*Puccinia, Agaricus*), Deuteromycotina (*Colletotrichum*). Brief account of Lichens.

Colletotrichum

Suggested Readings:-

Biswas S. B., Biswas Amita 1984. An Introduction to Viruses. Vikas Publishing House PVT LTD .

Smith , G.M. 1971 . Cryptogamic Botany Vol. I. Algea & Fungi. Tata Mc Graw Hill Publishing Co ., New Delhi.

Sharma, O.P. 1992. Text Book of Thallophytes , McGraw Hill Publishing Co.

Sharma, P.D. 1991 The Fungi. Rastogi & Co Meerut.

Clifton, A. 1958. Introduction to the Bacterial. Mcgraw Hill & Co. New York.

Alexopoulas , C.J. , C.W. M. Mims , 1996. Introductory Mycology , 4th ed., John Wiley and Sons Inc .

Dube, H.C. 1990 . An Intoduction to Fungi , Vikas Publishing House PVT. LTD. Delhi.

Syllabus of B.Sc. (Medical)
w.e.f. July 2012
(1st Semester)
BOTANY

Paper Code: BOT– 101B **Cell Biology**

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting two questions from each unit. Question number 1 is compulsory (short answer type). Nine questions are to be set, spread over the entire syllabus. All questions carry equal marks.

Unit- I

Basic cell structure, composition and cell division:-Prokaryotic & Eukaryotic cell system, Cell division: Amitosis, Mitosis & Meiosis.

Unit – II

Cell Envelops and Bio molecules:-Structure and functions of cell wall and plasma membrane. General account of carbohydrates.

Unit- III

Cell Organelles:- Ultrustructure and function of nucleus, Golgi apparatus, Endoplasmic reticulum, Chloroplast, Mitochondria.

Unit- IV

Cell Organelles and Bio molecules: - Ultrustructure and functions of Lysosomes, Peroxysomes, Ribosomes, and Vacuoles. General account of proteins and lipids.

Suggested Reading :-

Alberts, B.Bary, D. Lewis , J. Raff, M., Roberts, K. and Watson, I.D. 1999. Molecular Biology of Cell. Garland Publishing Co. , Inc, New York. US.

Gupta , P.K. 1999 . A Text Book of Cell and Molecular Biology. Rastogi Publication, Meerut, India.

Kleinsmith L.J. and Kish, V.M. 1995. Principles of Cell and Molecular Biology (2nd Edition). Harper Collins College Publisher, New York, USA.

Lodish, H., Berk, A Zipursky, S.L. Matsudaira. P., Baltimoe , D. and Darnell, J.2000. Molecular Biology, W.H. Freeman and Co., New York., USA.

Powar, C.B. 1983. Cell Biology.(3rd Edition). Himalaya Publishing House.

Lehninger , A.L. , Nelson , D.K. and Cox , M.M. 1993. Principles of Biochemistry , CBS Publishers and Distributors , New Delhi.

Syllabus of B.Sc. (Medical)
w.e.f. July 2012
(1st Semester)
BOTANY
Practical

Paper Code: BOP– 101

L – T – P
-- -- 4

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

List of Practical's:-

1. Preparation of temporary slides of various members of Algae and Fungi (as per Syllabus) to study vegetative and reproductive structure.
2. Identification of Permanent Slides of algae, fungi and lichens.
3. Slide preparation & Mitosis from Onion root tips & identification of various mitotic stages & Meiosis from onion flower buds and identification of major stages.
4. Survey of the area for the collection of the Algae, diseased plants and fungi.
5. Preparation of Survey/ Collection Report.
6. Viva-Voce and Practical Record.

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Syllabus of B.Sc. (Medical)
W.e.f. July 2015
(2nd Semester)
BOTANY

Paper Code: BOT-102A

Diversity of Cryptogams (Bryophytes & Pteridophytes)

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit- I

Bryohpyta:- Amphibians of Plant kingdom, displaying alternation of generations, General characters, Economic importance, Alternation of generation and classification (up to classes), Structure and Reproduction of *Marchantia* (Hepaticopsida)

Unit- II

tructure and Reproduction of *Anthoceros* (Anthoceropaida), *Funaria* (Bryopsida.). General account of porophyte evolution in Bryophytes

Unit-III

eridophyta:- The First vascular Plant, General characters, Economic importance, Alternation of neration and classification (up to classes). Structure and Reproduction of *Rhynia* (Psilopsida), *laginella* (Lycopsida)

Unit-IV

ucture and Reproduction of *Equisetum* (Sphenopsida), *Pteris*. (Pteropsida). Evolution of stellar stem.

ggested Readings:-

ihar, N.S. (1972) An introduction to Embryophyta Vol. Bryophyta Central Book Ltd Allahabad.
ston, E.V. 1982. Structure and Life of Bryophytes B.I. Publishers.
ith , G.M. 1971. Cryptogamic Botany. Vol. 11. Bryophytes and Pteridophytes. Tata Mc Graw Hill blishing Co., New Delhi.
rma O.P. 1990. Text Book of Pteridophyta , Mcmillan, India Ltd.
, P. 1980, Bryophyta Atma Ram & Sons Delhi.
rne, K.R. ,1982. The Morphology of ~~Gymnosperms~~ Pteridophytes B.I.

Syllabus of B.Sc. (Medical)

w.e.f. July 2015
(2nd Semester)
BOTANY

Paper Code: BOT-102B **Genetics**

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit –I

Chromosome Organisation: - Morphology, Centromere and Telomere, Giant Chromosomes, Sex Chromosome, Karyotype.
DNA the Genetic Material: - DNA Structure, Replication, DNA-protein interaction; the Nucleosome models; Genetic Code.

Unit- II

Genetic Inheritance: - Mendelism; Laws of segregation and independent assortment; Linkage analysis; Allelic and non allelic interaction; Crossing over.

Unit –III

Genetic Variations:- Variation in structure , Deletion, Duplication, Translocations, Inversions, Variations in Chromosome number, Aneuploidy, Polyploidy .Mutation, Spontaneous and induced, Transposable genetic elements, DNA damage and repair.

Unit-IV

Extra nuclear Genome:- Presence and function of mitochondrial and Plastid DNA, Plasmids.

Gene Expression: - Structure of gene and transfer of Genetic information (Translation and Protein synthesis & rRNA, tRNA, mRNA, Protein I D, 2D&3D structure), Regulation of gene expressions in prokaryotes (Operon Concept).

Suggested Readings:-

Snustad ,D.P. and Simmons, M,J, 2000. Principles of Genetics John wiley and Sones Inc USA.

Russel, P.J. 1998. Genetics. The Benjamin/ Cummings Publishing Co Ine . USA.

Stent, G.S.1986. Molecular Genetics, OBS Publications.

Brown , T.A. 1999. Genome. John wiley and sons (Asia) PVT Ltd.

Purohit, S.S. 2006. Gene , Genetics and Genetic Engineering. Agrobios India.

Joshi , P . 2004 Genetic Engineering and its Applications (2nd Ed). Agrobios. India.

Babcock, E.B. 2004. Genetics and Plant Breeding Agrobios, India.

Lodish,H., Berk., A., Zipursky, S.L., Matudaria, P., Baltimore, D. and Darnell, J., 2000. Cell and Molecular Biology, W.H. Freeman and Co., Newyork, U.S.A.

Gupta, P.K. 1999. A Text Book of Cell and Molecular Biology. Rastogi Publication Meerut India.

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(2nd Semester)
BOTANY
practical

Paper Code: BOP-102

L – T – P
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Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

List of Practical's:-

1. Study of Specimens from bryophytes (as per syllabus).
2. Study of Specimens from Pteridophytes (as per syllabus).
3. Identification of permanent slides of bryophytes and pteridophytes (As per theory Syllabus).
4. Experiments on Monohybrid and Dihybrid ratio.
5. Gene interactions and modified Dihybrid ratio.
6. Chi- Square analysis.
7. Study of giant chromosomes (Polytene, lampbrush) and karyotype by slides or models.
8. Field Tour of an area rich in diversity of bryophytes and pteridophytes (Hill Station) and Preparation of Herbarium and Survey Report.
9. Practical Record and Viva-voce.

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(3rd Semester)
BOTANY

Paper Code: BOT-201A

Diversity & Systematics of Seed Plants-I

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Paper I (Theory) - Diversity & Systematics of Seed Plants-I
BOT-201

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit-I

Characteristics of seed plants; evolution of seed habit. Seed plants with (angiosperms) & without (gymnosperms) fruits. Evolution & diversity of gymnosperms, general features of gymnosperms.

Unit- II

Distribution and economic importance of Gymnosperms. Classification of gymnosperms, fossilization process & fossil gymnosperms.

Unit-III

Fossil gymnosperms:-*Lyginopteris, Glossopteris, Williamsonia, Medullosa, Cycadeoidea (Bennettites), Cordaites.*
Morphology of vegetative & reproductive parts:- Anatomy of root, stem & leaf reproduction and life cycle of *Cycas.*

Unit-IV

Morphology of vegetative & reproductive parts: - Anatomy of root, stem & leaf reproduction and life cycle of:-
Pinus
Ephedra.

Suggested Readings:-

Bhatnagar, S.P. and Moirtra, A., 1996. Gymnosperms, New age International Limited, New Delhi.

Gifford, P.H. and Heywood, V.H., 1963. Morphology and Evolution of Vascular Plants, W.H Freeman & Company, New York.

Sporne, K.R., 1965 . The morphology of Gymnosperms, Hutchinson & Co.,(Publishers) Ltd., London.

Stewart, W.M., 1983. Paleobotany and The Evolution of Plants, Cambridge University Press, Cambridge.

Bierhorst, D.W. (1971). Morphology of Vascular Plants. MacMillian Company Ltd. New York.

Sporne K.R., 1982. The Morophology of Gymnosperms . B.I. Publishers .

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(3rd Semester)
BOTANY
Plants Anatomy

Paper Code: BOT-201B

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit-I

Diversity in plant forms in annuals, biennials and perennials, Body parts of Flowering plant and Modular growth.
Tissues: Types of tissues in flowering plants. Cambium & its functions.

Unit –II

The Shoot System : The shoot apical meristen & its histological organization; Vascularisation of Primary shoot in monocotyledons and dicotyledons ; ~~Formation of internodes, Branching pattern , Monopodial & Sympodial growth.~~
Canopy architecture; Secondary growth/ formation of secondary xylem and phloem, Secondary growth in extraxylary region/ Periderm. A general account of wood structure and its characteristics. Anomalous Secondary growth in *Boerhaavia, Mirabilis* and *Dracaena.*

Unit-III

The Shoot System: Formation of internodes, Branching pattern, Monopodial & Sympodial growth. Canopy architecture.
Leaf- Origin development, arrangement & diversity in size & shape, internal structure in relation to photosynthesis & water loss. Adaptations to water stress; Senescence and abscission.

Unit- IV

The Root System- the root apical meristem; differentiation of Primary & Secondary tissues and their roles; Types of root system. Structural modifications for storage, support, respiration, propagation and perennation, root nodules.

Vegetative propagation and its economic aspects.

Suggested Readings:-

Cutter, E.G., 1969 . Part I, Cells and Tissues, Edward Arnold, London.

Cutter, E.G., 1971. Plant Anatomy: Experiment and Interpretation, Part II, Organs, Edward Arnold , London.

Esau, K., 1977. Anatomy of Seed Plants, (2nd Edition), John Wiley & Sons, New York.

Eames, A.J. and Mac Daniels L.H. 1947. An introduction to Plant Anatomy. Mc. Graw Hill Book Co. New York.

Esau, K. (1985). Plant Anatomy, Wiley-Eastern, New Delhi .

Fahn, A., 1974. Plant Anatomy, (2nd Edition) , Pergamon Press, Oxford.

Hartmann, H.T., and Kestler, D.E., 1976. Plant Propagation: Principles and Practices, (3rd Edition), Prentice Hall of India Pvt. Ltd., New Delhi.

Mauseth, J.D., 1988. Plant Anatomy, The Benjamin/Cumming Publishing Company Inc., Menlo Park, California, U.S.A.

Bier horst, D.W. (1971) Morphology of Vascular Plants. MacMillian Company Ltd. New York.

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Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(3rd Semester)
BOTANY
Practical

Paper Code: BOP-201

L – T – P
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Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Diversity of seed plants & plant anatomy:-

1. Identification and classification of the specimens from gymnosperms and angiosperms with a note on features for identification. (As per theory syllabus)
2. Permanent and double stained slide preparations of gymnosperms and angiosperms. (As per syllabus)
3. Identification of permanent slides (gymnosperms and angiosperms) giving reasons. (As per theory syllabus)
4. Collection of wild angiosperms from the surrounding areas and gymnosperms From hilly areas and preparation of a field report (Rare plants should not be collected).
5. Note book, Viva-voce.

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(4th Semester)
BOTANY

Paper Code: BOT-202A **Diversity & Systematic of Seed Plant-II**

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Paper I (Theory) - Diversity & Systematic of Seed Plant-II

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit-I

axonomy and Systematic:- Aims & fundamental components of taxonomy (identification, lassification , Nomenclature, description and Phylogeny), taxonomic literature. Role of hemotaxonomy, cytotaxonomy and taximetrics in relation to taxonomy.

Unit- II

otanical Nomenclature- Principles and rules, Principle of priority, Type concept, taxonomic ranks eys of identification of plants- Herbarium, Botanical gardens, Dichotomous keys.

Unit-III

assification of Angiosperms: - Salient features of the system proposed by Bentham & Hooker and gler & Prantle. Origin of angiosperms and relationship of major groups.
versity of flowering plants as illustrated by members of the families.
nunculaceae, Brassicaceae, Malvaceae

(outline only) Taxonomy, Angiosperm Phylogeny Group (APG system) 1/3/19 Principle and basis only

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Unit- IV

Euphorbiaceae, Rutaceae, Fabaceae, Apiaceae, Asclepiadaceous, Lamiaceae, Solanaceae, Asteraceae, Liliaceae and Poaceae.

Suggested Readings:-

Sivarajan, V.V. (1985). Introduction to Principles of Plant Taxonomy .Oxford & IBH Publ. Co., New Delhi .

Mathur, R.C. and Chauhan, S.V.S. (1989) . Systematic Botany, Agra Book Store, Agra.

Davis, P.H. and Heywood, V.H., 1963 . Principles of Angiosperm Taxonomy, Oliver and Boyd, London.

Heywood, V.H. and Moore, D.M. (eds.), 1984. Current Concepts in Plant Taxonomy, Academic Press , London.

Jeffrey, C., 1982. An introduction to Plant Taxonomy, Cambridge University Press London.

Jones, S.B., Jr. and Luchsinger A.F., 1986. Plant Systematics (2nd Edition), McGrawHill Book co., New York .

Maheshwari, J.K., 1963. Flora of Delhi, CSIR, New Delhi.

Radford, A.E., 1986. Fundamentals of Plant Systematics, Harper and Row, New York.

Stace, C.A., 1989. Plant Taxonomy and Biosystematics (2nd Edition), Edward Arnold, London.

Willis, K.J. and Mc Elwaine , J.C. (2002) . The evolution of plant, Oxford University Press.

Singh , G. (2004). Plant systematics- Theory and Practice (2nd ed.) Oxford of IBH Publishing Co. Pvt. Ltd New Delhi.

Gurcharan Singh. Plant Taxonomy

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Syllabus of B.Sc. (Medical)

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W.e.f. July 2015
(4th Semester)

BOTANY

Paper Code: BOT-202B

Reproduction & Embryology of Flowering Plants

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit –I

Flower

A modified shoot; structure & functions of various floral parts, types of Inflorescence. Structure of Microsporangium and dehiscence mechanism, Microsporogenesis, Pollen grains and its structure, Pollination (Types and Agencies)

Unit- II

Microgametogenesis

Pollen germination, Development of male Gametophyte; Pollen-Pistil interaction; Self - Incompatibility.

Unit-III

Megasporogenesis and Megagametogeness

Structure of Mega sporangium (Ovule); Types of ovule; megasporogenesis ; Development of female gametophyte & its Types (Mono, Bi & tetrasporic); Double fertilization; **Endosperm** Types and its biological importance.

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Unit- IV

Embryogenesis in Dicot and monocot; Polyembryony
Seed & Fruit-Formation of seed; seed structure; types of seed; germination; ecological; adaptations, dispersal strategies. Formation of fruit & types of fruit.

Suggested Readings:

Bhojwani. S.S.and Bhatnagar S.P. (1985) . The Embrylogy of Angiosperms. Vani Educational Books , New Delhi.
Bhojwani , S.S. and Bhatnagar, S.P., 2000. The Embryoligy of Angiosperms, 4th Revised and Enlarged Edition, Vikas Publishing House, Delhi.
Fageri, K., and Van Der Pijl, 1979 The Principles of Pollination Ecology, Pergamon Press, Oxford.
Proctor, M. and Yeo, P., 1973 The Pollination of Flowers, William Collins Sons London.
Raven, P.H., Evert, R.F. and Eichhorn, S.E., 1999. Biology of Plants, 5th Edition , W.H., Freeman and Co., Worth Publishers, New York.
Thoms, P., 2000. Trees: Their Natural History, Cambridge University Press, Cambridge.
Mukundan, U. 1997. Botany A New Approach . Agrobios , India.
Purohit, S.S. 2002. Flowering Physiological, Biochemical and Molecular Aspects. Agrobios, India.
Good, R. 2006. Flowering Plants and their evolution . Agrobios, India.
Shivanna, K.R., Johris,B.M. 1985. Angiosperm Pollens. Narosa.
Dey , S.C. 2005. Fruits growing in Pots Agrobios , India.
Vanangamudi, K. 2006. Advances in Seed Science and Technology: Forest Tree Seed Production (Vol.4). Agrobios, India.

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(4th Semester)
BOTANY
Practical

Paper Code: BOP-202

L – T – P
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Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

1. Describe and compare the given flowers a & b in semi technical language giving V.S. of flower, T.S.of ovary & floral diagrams with floral formulae. Identify & assign them to their respective families giving reasons.
2. Morphological note on the specimens from Angiosperms
3. Identification of slides (from Angiosperms) , & development & embryology) giving reasons.
4. Embryo study by dissecting out the globular/heart shaped embryo from the given plant material.
5. Study of pollen grains by dissecting out the anthers of the given plant material.
6. Note Book (collection & collection report).
7. Viva-voce.

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Syllabus of B.Sc. (Medical)
(5th Semester)
BOTANY
Plant Physiology

Paper Code: BOT-301A

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit - I

Plant Water Relations:-
Importance of water to plant life, physical properties of water, diffusion, osmosis, imbibitions and plasmolysis. Absorption and transport of water, transpiration - types, Physiology of stomata, factors effecting transpiration, importance of transpiration.

Unit- II

Mineral nutrition:-
Essential macro and microelement and their role; mineral uptake, deficiency and toxicity symptoms.

Transport of organic substances:-
Mechanism of phloem transport, source-sink relation, factors affecting translocation.

Unit-III

Photosynthesis:- Significance, Historical aspects, photosynthetic pigments, absorption and action spectra, enhancement effect, Concept of two photo systems , Z- Scheme, Photophosphrylation, Calvin cycle, C-4 pathway, CAM plants Photorespiration.
The concept of photoperiodism, physiology of flowering, florigen concept, physiology of senescence, fruit ripning.

Unit- IV

Respiration; ATP as biological energy currency, aerobic and anaerobic respiration, kreb cycle, electron transport mechanism (chemi-osmotic theory), redox potential, oxidative phosphorylation, pentose phosphate pathway
Seed dormancy, Seed germination, Factors of their regulation, plant movements.

Suggested Readings:-

Hopkins, W.G. (1999), Introduction to Plant Physiology. John Wiley and Sons, New York.
Krishanamoorthy, H.N. (1993) Physiology of Plant Growth and Development, Atma Ram & Sons: Delhi .
Kumar, H.D. and Singh, H.N. (1993) . Plant Metabolism (22nd edition), Affiliated East-West Press Pvt. Ltd., New Delhi.
Noggle, G.Ray and Fritz, George, J. (1976) Introductory Plant Physiology. Prentice Hall of India Pvt. Ltd., New Delhi.
Salisbury, Frank, B. and Ross, Clean, (1974). Plant Physiology Prentice Hall of India Pvt, Ltd.. New Delhi.
Wilking, M.B. (editer) (1969). Physiology of Plant Growth and Development, Tata McGraw Hill, India.
Galston, A.W. 1989. Life Processes in Plants , Scientific American Library, Springer Verlag, New York.

Syllabus of B.Sc. (Medical)
w.e.f. July 2012
(5th Semester)
BOTANY

Paper Code: BOT-301B **Bio-Chemistry and Biotechnology**

L – T – P
3 -- --

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit.Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit- I

Basics of Enzymes:-Discovery and nomenclature; characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and co factor, regulation of enzyme activity; mechanism of action.

Unit- II

Growth & development –Definitions, phases of growth and development, kinetics of growth.
Growth hormones- History and discovery of plant growth regulators, auxins, gibberellins, cytokinins and abscicic acid, ethylene biosynthesis and mechanism of action of PGRS

Unit-III

Lipid Metabolism- structure and function of lipids, fatty acid biosynthesis; beta-oxidation; saturated and unsaturated fatty acids; storage and mobilization of fatty acids.
Nitrogen Metabolism- Biology of nitrogen fixation; importance of nitrate reductase and its regulation; ammonium-assimilation.

Unit- IV

Genetic engineering and biotechnology-

Tools and techniques of recombinant DNA technology; cloning vectors; genomic and cDNA library. Transposable elements- techniques of gene mapping and chromosome walking.

Plant tissue culture-

Aspects of plant tissue culture, cellular totipotency, differentiation and morphogenesis; biology of *Agrobacterium.*

Transgenic plants; vectors for gene delivery and marker genes.

Suggested Readings:-

Lehninger, A.L. Nelson, D.V. and Cox M.M. (1993). Principles of Biochemistry. C.B.S.Publishers and distributors, New Delhi.

Lea, P.J. and Leegood, R.C. 1999. Plant biochemistry and Molecular Biology, John Wiley and Sons , Chichester, England,

Vasil, I.K. and Thorpe, T.A. 1994. Plant Cell and Tissue Culture, Kluwer Academic Publishers, The Netherlands.

Bhojwani S.S. 1990, Plant tissue culture: Applications and Limitations. Elsevier Amsterdam, Oxford.

]Bhojwani S.S. and Rajdan M.K. 1983. Plants tissue culture Theory and practice, Elsevier Amsterdam Oxford.

Trehan, Keshav 1994, Biotechnology, Wiley, Eastern New Delhi.

Ranjan, R. 2006. Tarnsgenic Plants Agrobios, India.

Purohit, S.S. 2006. The Gene. Agrobios India.

Joshi, P. 2004. Genetic Engineering and its Application (2Nd Edition). Agrobios India.

Trivedi, P.C. 2005. Advances in Biotechnology. Agrobios India.

Syllabus of B.Sc. (Medical)
w.e.f. July 2012
(5th Semester)
BOTANY
Practical

Paper Code: BOP-301

L – T – P
- -- -4

Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Physiological Experiments and Biochemistry:-

1. Study of plasmolysis and deplasmolysis. Study of osmotic pressure of cell sap and DPD by plasmolytic method.
2. Demonstration of imbibition by plaster of Paris method, study of osmotic phenomenon by potato osmoscope.
3. To measure stomatal frequency and stomatal index by using epidermal peels of leaf.
4. Comparison of stomatal and cuticular transpiration by four leaf /cobalt chloride method.
5. Demonstration of transpiration by Ganongs potometer/ farmers potometer.
6. Separation of plant pigments by paper chromatography/thin layer chromatography.
7. Effect of kind of light intensity and conc. of CO2 on oxygen evolution during photosynthesis using Wilmot's bubbler.
8. Demonstration of aerobic and anaerobic respiration.
9. Evolution of heat during respiration.
10. Biochemical tests of Carbohydrates/Proteins/Lipids.
11. Demonstration of phenomena of fermentation.
12. Experiment on plant movements and growth.
13. Determination of peroxidase activity.
14. To demonstrate amylase activity on starch

Experiments of Biotechnology:-

15. Media preparation, sterilization techniques, demonstration of isolation of tissue/cell and culturing & sub culturing of cell /tissue/organ.
16. To prepare the slants and petriplates for plant tissue culture.
17. Demonstration of anther culture, Protoplast isolation and culture using suitable models/charts/ photographs etc.
18. Demonstration of DNA model.
19. Brief introduction to the components and working of the instruments (Oven autoclave, incubator, Centrifuge, Laminar air flow chamber and spectrophotometer)

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(6th Semester)
BOTANY

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M-18

aper Code: BOT-302A Plant Ecology

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Total Credits: 02
Total Marks: 50

xternal Marks: 40
nternal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit- I

troduction to Ecology: Definition scope and importance, level of organization
vironment: - Introduction; Environmental Factors-Climatic, edaphic factors, Biotic factors, pography.

Unit-II

ological Adaptations:-Morphological, Anatomical and Physiological responses of plants to water (ydrophytes & Xerophytes), temperature & salinity.
pulation Ecology: - Growth curves, Species interactions, Ecotypes, Ecological indicators.

Unit III

mmunity Ecology:-Community characteristics, frequency, density, cover, life and growth forms, ological succession.
ytogeography: - Biogeographical regions of India, Vegetation types of India, Forest and Grassland. asive species (weeds).

Unit-IV

osystem :- Structure, abotic & biotic components, food chain food web, ecological pyramids, logical energetics, energy flow, biogeochemical cycles of carbon, nitrogen, phosphorus and water.
vironmental Pollution:-Types of pollution, pollutants, acid rain and its effects, effects of pollution plants
bal change:-Green house effect and green house gases, depletion of ozone layer, and ~~global warming,~~ climate change bon trading

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Suggested Readings:-

Odum, E.P. 1983. Basic Ecology, Saunders, Philadelphia.
Kormondy, E.J. 1996. Concepts of Ecology, Prentice-Hall of India Pvt. Ltd. New Delhi.
Sharma, P.D. (1993) Ecology and Environment. Rastogi Publications, Meerut.
Tyler Miller, Jr. C. 1990. Living in the Environment. Wadworth Publishing Company, Belment, California.
Khopkar, S.M. 1993. Environmental Pollution Analysis Wiley Eastern Ltd. New Delhi.
Misra, R. 1968. Ecology Workbook, Oxford and IBH Publishing Co. New Delhi.
Drummond, J.M.F. 2004. Ecology and Plant Diversities. Agrobios India.
Purohit, S.S. 2004. Environmental Pollution Causes, Effects and Control. Agrobios India.
Deo, P.P.2006. Plant Ecology . Egrobios India.

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1/3/19

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(6th Semester)
BOTANY

Paper Code: BOT-302A Economic Botany

L – T – P
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Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

Note- Attempt five questions in all, selecting one question from each unit. Question Number 1 is compulsory (short answer type). Nine questions are to be set in total Spread over the entire syllabus. All questions carry equal marks.

Unit- I

Food Plants :- Rice, Wheat, Maize, Potato, Sugarcane, their origin and distribution, growing regions, Botanical description, uses , Evolution, improved varieties.
Fibers: - Cotton & Jute, Origin and Distribution, Botanical description, Cultivation, uses, processing, Improved verities.

Unit-II

Vegetable oils:-Groundnut mustard and coconut, origin and distribution cultivation, Botanical description, uses & pests, improved verities.

Timber Yielding Plants: - Teak, Sal, Shisham, Chir, Bamboos, Distribution, Botanical description, Cultivation, uses, Seasoning of wood, Characteristics of wood.

Unit-III

Spices: - General Account of Ginger, Turmeric, Coriander, Clove.
Drugs and Medicinal Plants: - General Account of Sarpagandha, Neem, Belladonna, Cannabis and Opium.

Unit-IV

Beverages: - Tea & Coffee, Origin and Distribution, Cultivation, Botanical description, Uses, Preparation techniques.

Rubber: - Origin and distribution, Cultivation, Botanical description, Uses, Processing of rubber.

Suggested Readings:-

Kochhar, S.L.1998. Economic Botany in Tropics, 2nd Edition . Macmillan India Ltd New Delhi.

Sambamurthy, A.V.S.S.and Subramnyan, N.S. 1989. A Textbook Economic Botany. Wiley Eastern Ltd. , New Delhi.

Sharma , O.P. 1996. Hill's Economic Botany . Tata McGraw Hill Co. Ltd., New Delhi.

Simpson, B.B. and Conner-Oghorzaly, M. 1986. Economic Botany-Plants in Our World . McGraw Hill , New York.

Trivedi, P.C. 2006. Medicinal Plants : Ethnobotanical Approach. Agrobios India.

Singh, V.P. 2006. An Introduction to Modern Economic Botany. Agrobios India.

Syllabus of B.Sc. (Medical)
w.e.f. July 2015
(6th Semester)
BOTANY
Practical

Paper Code: BOP-302

L – T – P
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Total Credits: 02
Total Marks: 50

External Marks: 40
Internal Marks: 10

1. **Determination of pH of soil and water samples.**
2. Study of community structure by quadrate and line transect methods.
3. Determination of abundance and frequency, density and abundance and IVI of species by quadrate method.
4. Morphological and anatomical features of hydrophytes, xerophytes, halophytes and parasites in relation to their habit and habitat.
5. Preparation of a report on local visit to an industry and agricultural farm to identify the source and types of pollutants.
6. Identification and classification of the various food articles, fibers, oils, timber articles, spices, medicinal plants, rubber plant with reference to their morphology, economic importance and plant part used.
7. Collection | Project report.
8. Viva- Voce.