



# AMITY UNIVERSITY

## — RAJASTHAN —

Kant Kalwar, NH-11C,  
Jaipur-Delhi National Highway  
Jaipur-303007  
Tel.: 01426-405614 (Direct), 405  
Fax: 01426-405679

### Amity Institute of Biotechnology -Minutes of Board of Studies

2017-2018

**Minutes of BOS in Biotechnology held on 11-05-2018 in Director (AIB) Chamber, Block -D from 10.00 a.m.**

1. Prof.(Dr) S.L. Kothari, Director AIB and Chairman BOS, welcomed members of BOS including the external experts, Prof.(Dr.) Krishna Mohan, Coordinator Bioinformatics Centre, BISR Jaipur and Dr Sumita Kachhwaha, Associate Professor in Dept. of Botany, University of Rajasthan, along with special invitee Prof.(Dr) Vinay Sharma, Dean Academics Amity University Rajasthan.
2. Prof. Kothari informed the external members of the various programmes running in AIB.
3. Prof. Kothari explained the Re-structure of CBCS course scheme and syllabus in terms of reducing number of credits in each programme to enable student for self study as follows;

**(Credit Summary-Existing Applicable for 2015, 2016 & 2017 Batches)**

Program	CC-I	DE-I	VA-I	OE-I	Total-I
B.Sc Biotech(H) 3 Year	102	15	24	15	156
B.Tech Biotech: 4 Year	148	21	32	18	219
B.Tech Bioinformatics: 4 Year	144	21	32	18	213
B.Tech Food Tech: 4 Year	149	21	32	18	220
B.Tech + M.Tech Biotech: 5 Year	209	27	40	24	300
Integrated M.Tech CT: 5 Year	202	27	36	6	277
M. Sc. Biotechnology: 2 Year	84	09	12	09	114
M. Tech. Biotechnology: 2 Year	84	09	12	09	114

**(Credit Summary-REVISED Applicable 2018 batch onwards)**

Program	CC-II	DE-II	VA-II	OE-II	Total-II
B.Sc Biotech(H) 3 Year	107	15	20	12	154
B.Tech Biotech: 4 Year	144	21	28	15	208
B.Tech Bioinformatics: 4 Year	144	21	28	15	208
B.Tech Food Tech: 4 Year	144	21	28	15	208
B.Tech + M.Tech Biotech: 5 Year	176	27	36	15	254
Integrated M.Tech CT: 5 Year	206	09	32	06	253
M. Sc. Biotechnology: 2 Year	83	09	12	06	110
M. Tech. Biotechnology: 2 Year	83	09	12	06	110

4. Prof. Kothari explained the new pattern of Course Profile proposed by Hon'ble President Amity University Rajasthan.
5. Prof.(Dr.) Krishna Mohan suggested Program Learning Outcomes and Course Learning outcomes of B.Tech Bioinformatics.
6. Prof.(Dr.) Sumita suggested Program Learning Outcomes and Course Learning outcomes of BSc & MSc Biotechnology.
7. Prof.(Dr.) A.N.Pathak and Prof. (Dr) Vinay Sharma suggested Program Learning Outcomes and Course Learning outcomes of B.Tech Biotechnology and M.Tech Biotechnology.
8. Prof.(Dr.) Krishna Mohan & Prof.(Dr) A N Pathak suggested Program Learning Outcomes and Course Learning outcomes of B.Tech food technology.
9. The M.Tech. (Food Tech) course scheme and syllabus designed by Dr Naveen in coordination with Prof. Pathak was approved in principle.
10. Change in syllabus of **Data Structure & Algorithms (BTB /UMT205)** in B.Tech Biotechnology and B.Tech+M.Tech Biotechnology, applicable for 2017 batch onwards was discussed and approved.
11. Change in syllabus of **Genomics (BTF601)** in B.Tech Bioinformatics, applicable for 2015 batch onwards was discussed and approved.
12. Change in syllabus of **BASICS OF PERL PROGRAMMING I (BTF332)** in B.Tech Bioinformatics, applicable for 2017 batch onwards was discussed and approved.
13. Change in syllabus of **Fundamentals of Bioinformatics (ICT403)** in Integrated M. Tech. CT, applicable for 2016 batch onwards was discussed and approved.
14. Course scheme and syllabus for CT Programs –VII, VIII, IX & X sem (Applicable for 2015, 2016, 2017 & 2018 Batch was discussed and approved.
15. Change in B.Tech Biotech and B.Tech+M.Tech Biotech-VII sem course title and syllabus (Applicable for 2015 Batch onwards) was discussed and approved as follows;

Existing					
BTB/UMT705	Pharmaceutical Technology & Biotechnology	CC	3	-	3
Revised					
BTB/UMT705	Pharmaceutical Science & Technology	CC	3	-	3

The meeting ended with a vote of thanks.

*By*  
11/05/18  
a



B-Tech Biotech

BTech + MTech Biotech

Existing

## PHARMACEUTICAL TECHNOLOGY AND BIOTECHNOLOGY

Course Code: UMT 705/BTB705

Credit Units: 03

### Course Objective:

The main objectives are to cover representative pharmaceutical dosage forms and general issues of formulation, production, quality requirements, validation and uses and to gain an understanding of the challenges associated with quality pharmaceutical manufacturing

### Pharmaceutical Technology:

#### Module -I:

**Introduction to Physical Pharmaceutics** – Metrology, Calculations and Posology.

**Pharmacopoeias & Formularies:** IP, BP, USP

**Packaging of Pharmaceuticals:** Polymer Science and Applications, Formulations and Development, Packaging

**Particulate Technology:** Particle Size, Size reduction, Size Separation, Powder Flow and Compaction

**Unit Operations:** Mixing, Evaporation, Filtration, Centrifugation, Extraction, Distillation, Sterilization, and Drying

#### Module-II

#### Pharmaceutical Dosage Forms & New Drug Delivery Systems:

Introduction to different dosage forms, their classification with examples (Official formulation), their relative application. Various route of drug administration.

Drug delivery systems: transdermal, parenteral, oral, mucosal, ocular, buccal, rectal and pulmonary delivery. Novel formulation approaches for better delivery of biotechnology derived drugs, such as reverse micelles, liposomes, microemulsions and microencapsulation.

### Pharmaceutical Biotechnology:

#### Module III

#### Immunity & Immunological preparations.

Introduction about Immunity, Types of Immunity, Immunological preparations, Classification of Immunological preparations, Bacterial & Viral Vaccines, Method of preparation using animals, Alternative method using eggs, Diagnostic preparations containing bacterial toxins, Preparation containing antibodies used to produce passive immunity.

#### Blood & blood Products:

**Blood Products and Plasma Substitutes:** Collection, processing and storage of whole human blood, concentrated human RBCs, dried human plasma, human fibrinogen, human thrombin, human normal immunoglobulin, human fibrin, fibrin foam, plasma substitutes: ideal requirements, PVP, dextran.

#### Module-IV

#### Pharmaceutical Biotechnology based drug Products:

Introduction, Method of Preparation and Use of :Activase, Humulin, Streptokinase, Humatrope, Hepatitis B vaccine.

Introduction, Method of Preparation and Use of : Penicillins, streptomycins, tetracyclines, vitamin B12 & ethanol.

#### Evaluation:

Components	Other Components	Attendance	MTE	ESE
Weightage (%)	10	5	15	70

#### Text & References:

1. Daan J. A. Crommelin and Robert D. Sindelar, (2014). Pharmaceutical Biotechnology, 3<sup>rd</sup> Ed. Informa Healthcare USA, Inc.
2. Chandrakant Kokate, Pramod H.J and S.S. Jalalpure, (2012). Textbook of Pharmaceutical Biotechnology, Elsevier Health Sciences.
3. Vyas S.P and Dixit V.K. (2007) Pharmaceutical Biotechnology 1<sup>st</sup>Ed. CBS Publishers & Distributors.

*[Handwritten signature]*

*[Handwritten signature]*

B.Tech. Biotech / B.Tech + M.Tech Biotech

Revised  
2018 onwards

## PHARMACEUTICAL SCIENCE AND TECHNOLOGY

Course Code: UMT 705 / BTB-705

Credit Units: 03

### Course Objective:

The main objectives are to cover representative pharmaceutical dosage forms and general issues of formulation, production, quality requirements, validation, uses of drugs and their regulations in pharmaceutical science and technology.

### Module-I

**Pharmacology and Medicinal Chemistry:** Basic concept of drugs and receptors, General pharmacological principles including Toxicology, Pharmacokinetics and Pharmacodynamics of drugs. Various Phases of drug discovery and development process including Target & Lead identification and Validation along with SAR & QSAR strategies. Pharmacology of drugs acting on Central nervous system, Autonomic nervous system, Cardiovascular system, Urinary system, and Antimicrobial agents.

### Module-II

**Pharmaceutics:** Metrology, Calculations and Posology. Introduction to different dosage forms, their classification with examples (Official formulation), their relative application. Various route of drug administration. Basics of pharmacokinetics and their importance in formulation, Bioavailability, Bioequivalence, Stability studies. Manufacturing standards and defects of Tablet, Capsule and Injectables in quality control. Novel formulation approaches for better delivery of biotechnology derived drugs, such as microemulsions and microencapsulation. Different methods of sterilization and sterility testing of pharmaceuticals.

### Module-III

**Pharmaceutical Jurisprudence:** Drugs and cosmetics Act and rules with respect to manufacture, sales and storage including GMP, GLP & GCP. Introduction to Pharmacopoeia with reference to IP, BP, USP and International Pharmacopoeia.

### Module-IV

**Clinical Pharmacy:** Clinical research and Pharmacovigilance, Drug – Drug interactions and Drug – food interactions, Therapeutic drug monitoring, adverse drug reaction (ADR), types of ADR, Mechanism of ADR. Drug interaction, Monitoring and reporting of ADR and its significance.

### Evaluation:

Components	Other Components	Attendance	MTE	ESE
Weightage (%)	10	5	15	70

### Text Books

- Textbook Of Physical Pharmaceutics by C.V.S. Subrahmanyam, Vallabh Prakashan.
- Text book of Pharmaceutical Engineering by C.V.S. Subrahmanyam, Vallabh Prakashan.
- Pharmacognosy by C.K. Kokate, A.P. Purohit and S.B. Gokhale, Nirali Prakashan, 2007
- Drug Discovery and Clinical Research, by S.K Gupta, Published by JAYPEE Brothers Medical Publishers (P) Ltd
- Pharmaceutical regulatory affairs by C.V.S. Subrahmanyam, Vallabh Prakashan 2018.
- Essential of Medical Pharmacology by K.D.Tripathi 2018, Published by JAYPEE Brothers Medical Publishers (P) Ltd.
- Principles of Pharmacology by H L Sharma and K K Sharma, Published by Paras Medical Publishers.

S. Subrahmanyam

Ravindra

9

## DATA STRUCTURE AND ALGORITHMS

Course Code: UMT: 205 / BTB 205

Credit Unit: 02

### Course Objective:

It helps the students to utilize the information acquired through electronic media to access biological information network and data bases in order to understand biological functions and then to evaluate genetic diseases, their causes and risks related to human kind.

### Course Contents:

#### Module I: Introduction

#### Module II: Programming strategies

Objects and ADTs with example, Constructors and destructors, Data structure, methods, Pre and post conditions, C conventions, Error handling, Some programming language notes.

#### Module III: Data structures

Arrays; lists; stacks and stack frames; Recursion -Recursive functions with example of factorial, Queue, Degeue.

#### Module IV: Searching

Sequential and binary search, Trees, binary search tree, complexity.

#### Module V: Queues

Priority queues and heaps

#### Module VI: Sorting

Bubble, Heap, Quick, Bin, Radix

#### Module VII: Searching revisited

Red-Black trees, AVL trees, general n-ary trees, hash tables; Hashing and collision resolution

#### Module VIII: Dynamic algorithm

Fibonacci numbers, binomial coefficients, optimal binary search trees, matrix chain multiplication, longest common subsequence, optimal triangulation.

#### Module IX: Graphs

Minimum spanning tree and Dijkstra's algorithm

#### Module X: Huffman encoding, FFT, Hard or intractable problems

Eulerian or Hamiltonian paths, Travelling salesman problem.

### Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

### Text & References:

#### Text:

- Data Structures and Algorithms, A.V. Aho, J.E. Hopcroft and J. Ullman, Addison-Wesley Publishing
- Database Design, Development and Deployment with Student CD, P. Rob and E. Semaan, McGraw-Hill/Irwin
- Schaum's Outline of Data Structures with C++, J.R. Hubbard, McGraw Hill Trade.

#### References:

- Database system concepts, A. Silberschatz, P.B. Galvin and G. Gagne, John Wiley and Sons Inc.
- Introduction to Data Structures and Application, J. Tremblay and P.G. Sorensen, McGraw Hill College Division

Ravindra  
a

## DATA STRUCTURE AND ALGORITHMS

Course Code: UMT205/DTB-205

Credit Unit: 02

### Course Objective:

It helps the students to utilize the information acquired through electronic media to access biological information network and data bases in order to understand biological functions and then to evaluate genetic diseases, their causes and risks related to human kind.

### Course Contents:

#### Module-I: Review of C

**Arrays:** one-dimensional and two-dimensional, **Function, Structure**, Array of structure, passing array to a function, passing structure to a function, **Pointers**, passing pointer to a function, function returning a structure, function returning a pointer, pointer to structure.

#### Module-II: Introduction to Data Structures

Definition, Types, Algorithm design, Complexity, Time-Space Trade offs.

#### Module-III: Introduction to Stack and Queue

**Stack:** Definition, Array representation of stacks, Operations Associated with Stacks- Push & Pop, Polish expressions, Conversion of infix to postfix, infix to prefix (and vice versa), **Queue:** Definition, Representation of Queues, Operations of queues- QInsert, QDelete, Deque.

#### Module-IV: Dynamic Data Structure

**Linked list:** Introduction to Singly linked lists: Representation of linked lists in memory, Traversing, Insertion and Deletion from linked list, doubly linked list, circular linked list. **Stack and Queue** implementation using linked list.

#### Module V: Sorting and Searching

**Sorting:** Bubble sort, Selection sort  
**Searching:** Linear search, Binary search

#### Examination Scheme:

Components	CT	Attendance	Assignment/ Project/Seminar/Quiz	EE
Weightage (%)	15	5	10	70

#### Text & References:

##### Text:

- Data Structures and Algorithms, A.V. Aho, J.E. Hopcroft and J. Ullman, Addison-Wesley Publishing
- Database Design, Development and Deployment with Student CD, P. Rob and E. Semaan, McGraw-Hill/Irwin
- Schaum's Outline of Data Structures with C++, J.R. Hubbard, McGraw Hill Trade.

##### References:

- Database system concepts, A. Silberschatz, P.B. Galvin and G. Gagne, John Wiley and Sons Inc.
- Introduction to Data Structures and Application, J. Tremblay and P.G. Sorensen, McGraw Hill College Division

Ravindra

S. S. Lakshmi

g