



### List of Revised Courses

Department : **Biotechnology**

Program Name : **Ph.D.**

Academic Year : **2017-18**

### **List of Revised Courses**

Sr. No.	Course Code	Name of the Course
1.	Paper2	Analytical and Separation Techniques



## Minutes of Meetings (MoM) of Board of Studies (BoS)

**Academic Year : 2017-18**

**School : School of Studies of Interdisciplinary Education and Research**

**Department : Biotechnology**

**Date and Time : 13-04-2017 - 12:00 Noon**

**Venue : Room of Head, Department of Biotechnology**

MINUTES OF THE MEETING OF BOARD OF STUDIES IN BIOTECHNOLOGY  
HELD ON 13/04/2017

A Meeting of the BOS was held on 13/04/2017 at 12:00 Noon to discuss the following:

- To discuss and approve the course structure and scheme of examination of Int. UG/PG, M.Sc. and Ph. D courses in Biotechnology and following members were present:
- Any other matter by permission of the Chair.
  - Dr. Renu Bhatt, Head
  - Prof. B.N. Tiwary, Professor
  - Prof. Ragini Gothwal,
  - Ms. Alka Ekka, Assistant Professor

Chairman  
Member  
Expert  
Member

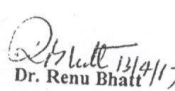
At the very outset the HOD and Chairman of BOS welcomed all the esteemed members and placed the draft prepared to revise course structure and scheme of examination in the light of UGC directives as per CBCS scheme to be implemented from 2017-18. The Syllabus of M.Sc Biotechnology and Pre Ph.D course work was also updated and placed before the committee.

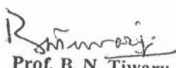
The course structure and scheme of examination was discussed and approved by all the members.

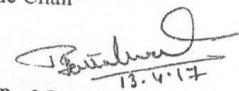
The chairman categorically pointed out that in the UG courses only 03 core subjects have to be defined and the student shall have to opt for honors subject in Ist semester only.

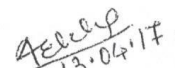
Group A: Biotechnology-Chemistry-Zoology  
Group B: Biotechnology-Chemistry-Botany

The meeting ended with a vote of thanks by the Chair

  
Dr. Renu Bhatt  
Chairman

  
Prof. B. N. Tiwary  
Member

  
Prof. Ragini Gothwal  
Expert

  
Ms. Alka Ekka  
Member



In the meeting of BOS-Biotechnology held on 13-40-2017, the following courses were revised in the of Syllabus of B. Sc. and M.Sc. Ph.D. Course work:

Sr. No.	Course Code	Name of the Course
1.	LBTC 402	Paper-2 Biophysical Techniques
2.	LBTC 502	Animal & Plant biotechnology (core)
3.	LBTC 503	Bioinformatics (Core)
4.	LBTC 504	a) Medical Diagnostics (Elective)
5.	LBTC 505	b) Biotechnology in Crop improvement (Elective)
6.	LBTC 506	Laboratory – 1
7.	LBTC 507	Laboratory - 2
8.	LBTC 601	Industrial Biotechnology (core)
9.	LBTC 602	Biosafety, Bioethics & IPR (core)
10.	LBTC 603	a) Fermentation Technology (Elective)
11.	LBTC 604	b) Gene therapy (Elective)
12.	LBTC 605	Laboratory - 1
13.	LBTC 606	Dissertation on electives
14.	LBTC 701	Cell Biology
15.	LBTC 702	Microbiology
16.	LBTC 705	Laboratory - 1
17.	LBTC 801	Molecular Biology
18.	LBTC 802	Immunology
19.	LBTC 803	Bio techniques
20.	LBTC 804	Enzymology and Enzyme Technology
21.	LBTC 805	Laboratory– 1
22.	LBTC 806	Laboratory -2
23.	LBTC 902	Microbial Biotechnology (Core)
24.	LBTC 903	Animal Biotechnology (Core)



25.	LBTC 904	a) Bioprocess Technology (Elective)
26.	LBTC 905	b) Genomics & Proteomics (Elective)
27.	LBTC 906	c) Molecular Diagnostics (Elective)
28.	LBTC 907	d) Food Technology (Elective)
29.	LBTC 908	Laboratory -1
30.	LBTC 909	Laboratory -2
31.	LBTC 1001	Bioinformatics & Statistics (Core)
32.	LBTC 1002	a) Plant metabolic Engineering (Elective)
33.	LBTC 1003	b) Gene Therapy & Nanomedicine (Elective)
34.	LBTC 1004	c) Industrial & Fermentation Technology (Elective)
35.	LBTC 1005	d) Immunotechniques (Elective)
36.	LBTC 1006	e) Entrepreneurship Management in Biotechnology (Elective)
37.	Paper2	Analytical and Separation Techniques

The following new courses were introduced in the Syllabus of B. Sc. and M.Sc. Ph.D. Course work:

Course Code	Course Name
LBTC 502	Animal & Plant biotechnology (core)
LBTC 601	Industrial Biotechnology (core)
LBTC 602	Biosafety, Bioethics & IPR (core)
LBTC 603	a) Fermentation Technology (Elective)
LBTC 604	b) Gene therapy (Elective)
LBTC 605	Laboratory - 1
LBTC 606	Dissertation on electives
LBTC 701	Cell Biology
LBTC 702	Microbiology
LBTC 705	Laboratory - 1
LBTC 801	Molecular Biology

**गुरु घासीदास विश्वविद्यालय**  
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)  
**कोनी, बिलासपुर - 495009 (छ.ग.)**



**Guru Ghasidas Vishwavidyalaya**  
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)  
**Koni, Bilaspur - 495009 (C.G.)**

LBTC 803	Bio techniques
LBTC 902	Microbial Biotechnology (Core)
LBTC 904	a) Bioprocess Technology (Elective)
LBTC 905	b) Genomics & Proteomics (Elective)
LBTC 907	d) Food Technology (Elective)
LBTC 1001	Bioinformatics & Statistics (Core)
LBTC 1002	a) Plant metabolic Engineering (Elective)
LBTC 1004	c) Industrial & Fermentation Technology (Elective)
LBTC 1005	d) Immunotechniques (Elective)

Signature & Seal of HoD

**विभागाध्यक्ष, जैव प्रौद्योगिकी विभाग**  
**Head, Department of Biotechnology**  
**गुरु घासीदास विश्वविद्यालय, बिलासपुर (छ.ग.)**  
**Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)**





## Syllabus

### Paper-III: Analytical and Separation Techniques

#### Unit - 1

Introduction and types of chromatography, paper, thin layer, affinity and column chromatography chromatography, Gel permeation, ion-exchange, GLC, HPLC, FPLC and instrumental details of each. Applications of Chromatographic techniques in Biology and research application.

#### Unit - 2

Paper and gel electrophoresis, Polyacrylamide gel electrophoresis (native and SDS), Agarose gel electrophoresis, 2-D electrophoresis. Blotting- Southern, Western and Northern blotting, Immunoblotting, Immunoelectrophoresis, DNA finger printing and ELISA

#### Unit - 3

Electromagnetic spectrum, Beer Lambert's Law, Photometry, UV/VIS Spectrophotometry, Infrared spectroscopy, Atomic absorption spectroscopy ESR and NMR spectroscopy, Mass spectroscopy (LC-MS, GC-MS), Fluorescent spectroscopy Applications of different Spectroscopic techniques in Biology

#### Unit - 4

DNA Microarray, Protein Microarray, Microarray analysis, DNA chip, DNA Probes, FTIR, Flow cytometry,

#### Unit - 5

Detection and measurement of radioactivity, GM counter, Scintillation counter, Autoradiography, Safety measures in handling radioisotopes, RIA, non radiolabelling.

#### Suggested Readings

1. Nuclear Magnetic Resonance:(2007) Williams
2. Biochemical Techniques theory and practice: (2009) White R
3. Analytical Chemistry: (2000) Christian G. D.
4. A Biologist Guide to Principle and Techniques: (2009) Willson K. and Gounding K.H.
5. An Introduction to Practical Biochemistry:(2008) Plummer D. T.

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13/4/17