



# Sant Baba Bhag Singh UNIVERSITY

Village: Khiala: PO: Padhiana, Distt: Jalandhar 144030  
Website: www.sbbsuniversity.ac.in Phone: 0181-2711163 Fax: 0181-2711555

## DEPARTMENT OF LIFE SCIENCES AND ALLIED HEALTH SCIENCES

Ref. No. SBBSU/L.S/2025/68A

Dated: 21.6.25

The Vice-Chancellor,  
SBBS University,  
Jalandhar

**Subject: For the approval of expert for BoS meeting of the Coursework paper of the Ph.D Biochemistry programme (BCH903)**

Respected Sir

This is submitted that the Department of Life Sciences and Allied Health Sciences proposes to conduct the meeting of BoS (Board of Studies) for the approval of the Syllabus for the Coursework paper of Ph.D Biochemistry Programme. **The meeting of Board of Studies (BoS) may be conducted on 4<sup>th</sup> June 2025 at 2:00 PM through online mode.** You are requested to approve the date and timings of the meeting and the subject experts from the below-mentioned list of external experts (along with TA/DA and Honorarium, applicable as per rule) for the conduct of the BoS meeting.

S. No.	Name of Expert	Designation	Specialization	Institute
1 ✓	Dr. Uma Arora	Professor (Retd.),	Biochemistry	Dept. of Biochemistry, PIMS Hospital, Jalandhar
2	Dr. Promila	Professor (Retd.),	Clinical Biochemistry	BIS College of Science & Technology, Gagra, Moga
3	Dr. Prabhjot Kaur	Assistant Professor (Biotechnology)	Biochemistry	Dept. of Biochemistry, PIMS Hospital, Jalandhar
4	Dr. RK Bansal	Sr. Biochemist (MD Biochemistry)	Clinical Biochemistry	Bansal Endocrinology & Clinical Laboratory, Ludhiana

Submitted for kind consideration and approval, please.

Co-ordinator  
Life Sciences and Allied Health Sciences

  
21/6/25  
Head (Life Sciences) & Dean UIS

Serial No. Dr Uma Arora, PIMS Hospital, is approved.

  
02/6/25



# SANT BABA BHAG SINGH UNIVERSITY

Vill. Khiala, P.O. Padhiana, Distt. Jalandhar - 144 030 (PB.)  
Recognized by UGC under Section 2(f) of UGC Act, 1956.

SBBSU/OA/25/125/A)

Dated. 03/06/2025.....

To  
Dr. Uma Arora  
Professor (Retd.), Department of Biochemistry  
PIMS Hospital  
Jalandhar

**Subject: Invitation for Board of Studies Meeting for the approval of syllabus of the department-specific paper of the Ph.D Biochemistry programme (BCH903)**

Dear Madam,

This is to bring to your kind notice that the meeting of the Board of Studies (BOS) of the Department of Life Sciences & Allied Health Sciences (Institute: UIS), SBBSU, Khiala, Jalandhar is going to be held on 04 June 2025. You have been nominated as an external subject expert for the BOS meeting by the competent authority. I feel honored to invite you as an expert for the approval of the course contents and syllabus of the department-specific PhD coursework paper (Course Code: BCH903) of the Ph.D Biochemistry programme. Your experience and expertise will be of great help to the Department and the University.

Therefore, you are requested to kindly spare your valuable time to participate (through online mode) in the same on 04/06/2025 (Thursday) at 2:00 pm onwards.

Regards

  
Dr. Vijay Dhir  
Dean Academics  
SBBSU, Khiala, Jalandhar



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Ref. No: SBBSU/LS/2025/68(A)

Dated: 02/06/2025

## Meeting Circular

It is my pleasure to inform you that you have been appointed as a member of the Board of Studies (BOS) meeting to review the Ph.D Coursework syllabus of Ph.D Biochemistry Programme (BCH903) offered by the Department of Life Sciences & Allied Health Sciences.

List of the BOS members is given below:

S.No	Name	Subject	Designation	Institute	Position	Signature
1.	Dr Vijay Dhir	CSE	Dean Academics	Sant Baba Bhag Singh University, Jalandhar	Chairperson	
2.	Dr. Shweta Singh	Microbiology	Dean UIS	UIS	Member	
3.	Dr. Uma Arora	Biochemistry	Professor (Retd.),	Department of Biochemistry, PIMS Hospital, Jalandhar	Expert Member	
4.	Dr. Chetna Sharma	Biochemistry	Assistant Professor, Coordinator, Department of Life Sciences and Allied Health Sciences	UIS	Internal Member	
5.	Dr. Rohit Malhotra	Clinical Biochemistry	Assistant Professor	UIS	Internal Member	
6.	Dr. Younis Ahmed	Zoology / ((Endocrinology)	Assistant Professor	UIS	Internal Member	
7.	Dr. Jagdeep Kaur (Dean UIET)/ Her representative				Member	
8.	Dr. Aneet Kumar (Dean UIE)/ His representative				Member	
9.	Dr. Pooja Bali (Dean UIL, UICAS)/ Her representative				Member	
10.	Dr. Ajay Pathania (Dean UICM)/His representative				Member	



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are requested to attend the meeting on 04/06/2025 (Wednesday) at 2:00 PM onwards through  
ne mode. All are requested to join online as per the link details provided through email.

**Agenda of the meeting will be as follows:**

1. Discussion and approval of syllabus of PhD coursework paper "Emerging Trends and Techniques in Modern Biochemistry" with course code BCH903 of Ph.D Biochemistry Programme for the admissions in the academic session 2025-2026.
2. Amendments of any suggestions by the experts regarding the syllabus.

**Dr. Chetna Sharma,**  
Coordinator  
Life Sciences and Allied Health Sciences  
SBBSU

**Dr. Shweta Singh**  
Dean UIS, SBBSU

# SANT BABA BHAG SINGH UNIVERSITY

## University Institute of Sciences (UIS)

Ref. No: SBBSU/LS/2025/69(A)

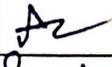
Dated: 04/06/2025

**Subject: Proceedings of the meeting of the Board of Studies (BoS) of Department-Specific Paper of Ph.D Biochemistry Programme offered by the Department of Life Sciences and Allied Health Sciences**

The meeting of members of BoS was held on 04/6//2025 at 2:00 pm onwards in the office of Dr. Shweta Singh, HOD, Life Sciences and Allied Health Sciences, Room No. 503. Dr. Uma Arora, Professor (Retd.), Department of Biochemistry, PIMS Hospital, Jalandhar, was the external expert. The following other members were present and approved the points discussed below.

S.No.	Name	Subject	Designation	Institute	Position
1.	Dr. Vijay Dhir	CSE	Dean Academics	Sant Baba Bhag Singh University, Jalandhar	Chairperson
2.	Dr. Shweta Singh	Microbiology	Dean UIS & Head (Life Sciences and Allied Health Sciences)	UIS	Member
3.	Dr. Uma Arora	Biochemistry	Professor (Retd.)	Department of Biochemistry, PIMS Hospital, Jalandhar	Expert Member
4.	Dr. Chetna Sharma	Biochemistry and Molecular Biology	Coordinator (Life Sciences and Allied Health Sciences)	Department of Life Sciences and Allied Health Sciences, UIS	Member
5.	Dr. Rohit Malhotra	Clinical Biochemistry	Assistant Professor	UIS	Internal Member
6.	Dr. Younis Ahmad Hajam	Zoology/Endocrinology	Assistant Professor	UIS	Internal Member
7.	Dr. Ravinder Singh	Biotechnology/Molecular Biology	Assistant Professor	UIS	Internal Member
<b>Members from the other institutes of SBBSU:</b>					

**Members from the other institutes of SBBSU:**

Dr. Jagdeep Kaur (Dean UIET)/ Her representative	Member	
Dr. Aneet Kumar (Dean UIE)/ His representative	Member	
Dr. Pooja Bali (Dean UIL)/ Her representative	Member	
Dr. Ajay Kumar Pathania (Dean UICM)/His representative	Member	
Dr. Nirmal Kaur (Dy. Dean UICAIIS)/Her representative	Member	

**The following Agenda was discussed and approved in this BoS meeting:**

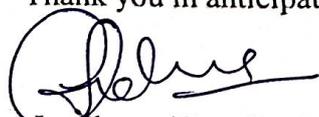
1. Discussion and approval of the proposed syllabus of the department-specific PhD Coursework paper "Emerging Trends and Techniques of Modern Biochemistry" with course code BCH903 of the PhD Biochemistry programme (Ph.D020) for the admissions in academic session 2025-2026 onwards.
2. Discussion and approval of the Course Objectives and course outcomes by the committee members.
3. Discussion and approval of the contents and credits of the course by the BoS committee members
4. Incorporation of amendments to the syllabus as suggested by the Subject Experts.

**Details of Proceedings of BoS Meeting**

S.N o.	Programme Name/ Programme Code	Course Code	Course Name	Remarks/Observations by Experts/Stakeholders/BoS Committee members	Action Taken
1	PhD Biochemistry /PhD 020	BCH903	Emerging Trends and Techniques of Modern Biochemistry	Proposed course content, along with course objectives and course outcomes, was approved with minor changes	Suggested changes were incorporated into the Syllabus of department- specific coursework paper (Paper-II) of PhD Biochemistry programme to be offered in the academic session July 2025 onwards.
2.	PhD Biochemistry / PhD020	BCH903	Emerging Trends and Techniques of Modern Biochemistry	Books mentioned in the prescribed text and reference sections are insufficient.	More text and reference books were added in the prescribed section as suggested by the External expert.

The meeting ended with a vote of thanks by Dean UIS.

Thank you in anticipation



In-Charge/Coordinator/Head of the Department



Dean of Institute

## Emerging Trends and Techniques in Modern Biochemistry

<b>Course Code</b>	BCH903
<b>Course Title</b>	Emerging Trends and Techniques in Modern Biochemistry
<b>Type of course</b>	Theory
<b>L T P</b>	4 0 0
<b>Credits</b>	4
<b>Course prerequisite</b>	M.Sc. Biochemistry or Life Science with biochemistry as one of the main Subjects
<b>Course Objective</b>	This syllabus is designed to provide students with a comprehensive understanding of the latest advancements in biochemistry, preparing them for careers in research, industry, and Academia.
<b>Course Outcomes</b>	<p>The students will be able to:</p> <ol style="list-style-type: none"> <li>1. Acquire basic knowledge about principles and applications of recent technologies in structural biochemistry.</li> <li>2. To become familiar with environment-related aspects of biochemistry and to examine potential applications of this knowledge for sustainable development</li> <li>3. Gain insights into basic principles, operational procedures, and applications of emerging techniques in molecular biology.</li> <li>4. Learn frequently used methods and techniques in biomedical nanotechnology</li> </ol>

### UNIT 1: Foundations of Modern Biochemistry:

Overview of Biochemistry and Molecular Biology, Advancements in Structural Biology, Proteomics and Metabolomics, Introduction to Systems Biology.

**Emerging Topics:** Artificial Intelligence in Biochemistry, Advancements in Single-Cell Analysis, Exploration of Extremophiles and Their Applications, Ethical, Legal, and Social Implications of Biotechnological Advances

### UNIT 2: Environmental and Sustainable Biochemistry:

Green Chemistry and Biocatalysis, Bioremediation and Waste Management, Sustainable Production of Biofuels and Bioplastics, Ethical Considerations in Environmental Biotechnology

**UNIT 3: Advanced Molecular Biology Techniques:** Principles and types of PCR (Polymerase Chain Reaction) RT PCR, qPCR, Modifications of PCR: Hot start, Touch down, nested PCR, Multiplex, Single-cell PCR, Fast-cycling PCR, Methylation-specific PCR (MSP).

**Sequencing Methods:** Principles Sanger sequencing, Overview of NGS Technologies and Platform, Application of NGS in Medicine and Biotechnology. DNA Fingerprinting.

**Chip-based technologies and their applications:** DNA Microarray, FISH (Fluorescence in situ Hybridization), DNA-protein interaction - chromatin immunoprecipitation, RNA interference and detection methods, Genome Editing Technologies: CRISPR-Cas9 technology

## UNIT 4: Nano-biochemistry and Nanobiotechnology

Introduction to Nanobiotechnology, Nanomaterials in Drug Delivery and Diagnostics, Synthesis of nanomaterials by physical and chemical methods, Synthesis of nanomaterials by biological methods, Characterisation of nanomaterials.

Nanomaterials for cancer diagnosis, Nanomaterials for cancer therapy, Nanotechnology in tissue engineering, Nano artificial cells, Nanotechnology in organ printing.

Nanotechnology in point-of-care diagnostics, Nanopharmacology & drug targeting, Cellular uptake mechanisms of nanomaterials, In vitro methods to study antibacterial and anticancer properties of nanomaterials, Nanotoxicology.

### Text & Reference Books:

S. No.	Name/Title	Author	Publisher
1	Physical Biochemistry, 2 <sup>nd</sup> Ed.	K.E Van Holde	Prentice Hall
2	Chemistry, health and environment, 2 <sup>nd</sup> Ed	Stern, O.	Wiley-Blackwell, 2010
3	Bio-organic Chemistry: A chemical approach to enzyme action	Dugas H	Springer, 2003.
4	Textbook of Organic Medical and Pharmaceutical Chemistry, 10 <sup>th</sup> Ed	Wilson, Gisvold & Dorque	Lippincott's Pover publishers, 1998.
5	Biodegradation and Bioremediation, 2 <sup>nd</sup> Ed.	Alexander, M	Academic Press, 1999
6	Biomedical Nanotechnology	Malsch, N.H.,	CRC Press, 2005
7	Nanotherapeutics: Drug Delivery Concepts in Nanoscience	Lamprecht, A.	Pan Stanford Publishing Pte. Ltd. 2009.

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# Sant Baba Bhag Singh University

(University Established under Punjab Act No.6 of 2015)  
Vill. Khiala, P.O. Padhiana, Dist. Jalandhar, Punjab, INDIA

## External Expert Review Performa For Board of Studies

Name of External Expert : Dr. UMA ARORA  
Discipline : Biochemistry  
Designation : Retired Professor, PIMS  
Organization (Name & Address) : PIMS, JLD  
Contact No. : 9464033342  
E-Mail ID : -  
Date of Visit/Meeting : 4.6.25

Reviewer's Comments :-

General Remarks:

1. Overall satisfactory
2. More Textbooks can be added with Indian authors

1.

Uma Arora  
Signature

Date: 7-6-25

  
Coordinator/HOD's/Dean's

Dean Academics

Ranjit Singh

# Sant Baba Bhag Singh University

(University Established under Punjab Act No.6 of 2015)  
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Signature

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Coordinator/HOD's/Dean's

Dean Academics

Ranjit Singh