

Department of Biochemical Engineering and Biotechnology

Minutes of the Departmental Faculty Board Meeting (DFB-05/2019-2020)

November 08, 2019

The fifth meeting of the Departmental Faculty Board for the academic session 2019-2020 was held on **Wednesday, November 6, 2019 at 3 PM** in the Departmental Committee Room (I-230).

The following members were present:

Prof. D. Sundar	HoD and Chairperson
Prof. Saroj Mishra	Member
Prof. Ashok Srivastava	Member
Prof. Prashant Mishra	Member
Prof. Atul Narang	Member
Prof. Shilpi Sharma	Member
Prof. Preeti Srivastava	Member
Prof. Ravikrishnan Elangovan	Member
Prof. Ashish Misra	Member
Prof. Rohan Jain	Member
Prof. Lucinda E. Doyle	Member
Prof. Ritu Kulshreshtha	Convener

Before taking up the Agenda, the Head of the Department informed the members of the following:

- a) *Faculty selections* - The Head updated the members about the faculty selections held on October 25, 2019 and the immediate need for identifying office/lab space for the new faculty.
 - b) *Technical Staff recruitment* - It is expected that the final approval for conducting selections for the 3 posts of Senior Lab Assistant (SLA) shall be received soon. The department would be required to conduct the written test and trade test as soon as this approval is received from the Administration.
 - c) *Grading/Moderation* - All the faculty/Course Coordinators were requested by the Head to display the Pre-Major Evaluations (PMT) to the students and also send a copy to the Head's Office by November 14, 2019 (thursday). It was also urged that the faculty members shall submit the grades for their respective courses on the ERP before coming for the Moderation Committee Meeting scheduled on Nov 28 (thursday) at 10 AM.
 - d) *Graduation data* - The Head presented the graduation data from Convocation 2019 as well as the date on students who have not completed their graduation requirements so far. It was suggested that the faculty might reach out to these students and their parents to extend any support that may be required to help them complete their courses/projects.
- 1. Confirmation of the minutes of 3rd and 4th meeting of the DFB for the session 2019-2020 held on October 9 and October 14-17, 2019, respectively.**

The minutes of the meetings were confirmed as circulated.

2. Matters arising out of the minutes.

Item No. 2. (Audit of -80 °C freezer usage in the department (Item No. 2 from the previous meeting and Item No. 9 from DFB-02/2018-2019))

The board had earlier recommended moving out the Telstar -80⁰ C freezer from its current location of I-203 lab to the shared space of the department (Instrumentation lab). It was noted that the concerned faculty member had insisted on abiding by the decision of the board only after all such equipments purchased through PLN funds are moved from other individual faculty labs to the shared labs of the Department. The Head informed that the compilation activity is still going on and the progress on this item will be reported in the board meeting as soon as it is ready.

3. Status of utilization of budget allocated by the Institute (PLN03/PLN03F/NPN05/books).

The Head discussed the status of the budget under various budget heads (**Annexure 1**). It was observed that most of the purchases under PLN03 funds still remained pending at various stages. The Head asked the concerned faculty to expedite the equipment purchases. It was also observed that various equipments were either over-budgeted or under-budgeted by some faculty members, leading to modifications/cancellations of the PFCs. It was thus suggested that in future, all the requests under PLN03 budget head, shall be made only after submitting comparative quotations received from vendors to get a proper estimate. The Head requested the UG lab in-charges to purchase the chemicals/consumables/other supplies required for conducting laboratory practicals in the next semester from NPN05 funds, after which the remaining funds can be utilized. It was also decided that Prof. Preeti Srivastava will complete the process of recommending the books to be purchased for the Institute Library at an earlier date.

4. PhD selections for Semester 2, 2019-2020.

The Committee constituted by the board for recommending a new format for conducting the PhD selections presented their report along with a revised syllabus and the new exam pattern (**Annexure 2**). It was decided that any feedback on this from the members can be considered and finalized in the ensuing DRC meeting scheduled on November 15, 2019.

5. Any other item with the permission of the Chair.

The recommendations of (a) Mid-term UG curriculum review committee and (b) Committee to consider changes in the teaching slot pattern and Institute semester scheduling, were discussed and the members were requested to send their comments to the DFB Convener for onward transmission to the Academics Section.

The meeting ended with a vote of thanks to the Chair.

Ritu Kulshreshtha
Convener, DFB

Distribution

All Faculty (by email)

Status of Purchases from PLN03

S.NO	PFC NO.	PFC. DATE	DESCRIPTION	AMOUNT	BUYER	CHAIRMAN	MEMBER	MEMBER	MEMBER	STATUS (as on Nov 06)
							1	2	3	
1	27498	05/09/19	SPARE OF MICRO AND ULTRA FILTRATION UNIT	250000	RJ	AN	ZAS	RJ		?
2	27499	05/09/19	SONICATOR	250000	RJ	TRS	RJ	AM		Cancel PFC ?
3	27504	05/09/19	VERTICAL GEL ELECTROPHORESIS UNIT PLUS POW	200000	PS	RK	PS	RJ		PO issued
4	27506	05/09/19	PERISTALTIC PUMPS (order 1)	200000	AN	RKE	AN	ZAS		Item delivered on Nov 05, 2019
5	27497	05/09/19	CENTRIFUGE WITH DIFFERENT ROTORS	1000000	RJ	AN	RJ	ZAS	AM	Quotation received for 2.5 lacs !
6	27500	05/09/19	SPARE OF FPLC	550000	SM	AN	SM	PS	RKE	Some terms were not clearly defined hence the revised Quotation is awaited by the vendor. 7.5 lakhs
7	27503	05/09/19	CO2 INCUBATOR WITH ACCESSORIES	600000	RK	PM	RK	RKE	AM	PO issued
8	27505	05/09/19	AUTOSAMPLER FOR HPLC (SHIMADZU)	400000	ZAS	AN	ZAS	AM	RJ	want to cancel ?
9			SPARE OF BIOENGINEERING BIOREACTORS	250000	AN					PFC yet to be made
10			UPGRADATION OF GC-MS	2500000	AN					STI form submitted to DDO for approval
11			2 GAS ANALYZERS	500000	AN					PFC yet to be made
12			2 MASS FLOW CONTROLLERS	200000	AN					PFC yet to be made
13			3 MASS FLOW METERS	360000	AN					PFC yet to be made
14			4 DESKTOP PCS	200000	AN					Purchasing of 1 desktop is under process through GEM (PFC made for Rs. 70000). The other 3 computers are yet to be processed
15			AD/DA TERMINAL & PCI WITH CABLE	140000	AN					PFC yet to be made
16			WATER DEMINERALIZATION UNIT	180000	AN					PFC yet to be made
17			DETECTOR FOR LC-MS AND ACCESSORIES	1500000	AN					Quotation received and file is with Audit
18			PERISTALTIC PUMPS (order 2)	200000	AN					PFC yet to be made

Available balance under other different Institute budget heads

PLN03/BBCE		NPN05/BBCE	
Total Allocation by Institute	₹1,15,02,000	Total Allocation by Institute	₹25,36,000
Amount already settled (A)	₹ 52,05,036	Amount already settled (A)	₹5,91,252
Amount committed (B)	₹ 59,30,000	Amount committed (B)	₹2,24,928
Total Expense (A+B)	₹ 1,11,35,036	Total Expense (A+B)	₹8,16,180
Available balance (as on Nov 06, 2019)	₹ 3,66,964	Available balance	₹17,19,820
Available balance as per Anzio (as on Nov 05, 2019)	₹ 22,88,367	Available balance as per Anzio (as on Oct 29, 2019)	₹17,22,144
PLN05/BBCE		Faculty	
Total Allocation by Institute	₹1,88,235	RKE	88643
Amount already settled (A)	₹88,643	RJ	99592
Amount committed (B)	₹55,460		
Total Expense (A+B)	₹1,44,103		
Available balance (as on Nov 06, 2019)	₹44,132		
PLN03F/BBCE		Faculty	
Total Allocation by Institute	₹3,00,000	RJ	75000
Amount already settled (A)	₹0	LCD	75000
Amount committed (B)	₹1,50,000		
Total Expense (A+B)	₹1,50,000		
Available balance (as on Nov 06, 2019)	₹1,50,000		
Budget for Books (allocated on 23-09-2019)			
Books allocation			
Total Allocation by Institute	₹2,72,152		
Amount already settled (A)	₹0		
Amount committed (B)	₹0		
Total Expense (A+B)	₹0		
Available balance (as on Nov 06, 2019)	₹2,72,152		

Recommendations of the Committee for recommending a new format for PhD selections

Committee members

Prof. Atul Narang, Prof. Preeti Srivastava, Prof. Ashish Misra, Prof. Lucinda Elizabeth Doyle

Pattern of written test

The written test will consist of 2 papers: Paper I will have multiple-choice questions and Paper II will be descriptive type. The weightage for paper I and paper II will be 33.3% each, and their total duration will be 1.5 hours. The weightage for the interview, which will be held for shortlisted students, will be 33.3%.

Paper I (containing multiple choice questions) will consist of two parts. Part A will contain 20 basic questions, which are compulsory for all students. Part B will contain 10 area-specific questions, and students can choose Part B (Biochemical engineering) or Part B (Biosciences).

Paper II will have 8 descriptive type questions, 4 in Biochemical engineering and 4 in Biosciences. Students can choose Biosciences or Biochemical Engineering.

Correct answers will result in 2 marks. Wrong answers will result in negative mark (minus one mark).

Syllabus for Paper I (Part A)

Basic physical chemistry: Properties of gases, chemical equilibrium, pH, ionization of weak acids and bases; solubility and precipitation.

Basic microbiology: Microbial Growth – Measurement techniques; growth kinetics.

Basic biochemistry and molecular biology: nucleic acid structure, Proteins – primary, secondary, tertiary & quaternary structures, Enzyme: chemical and functional nature of enzymes, enzyme kinetics.

Basic biochemical engineering: Batch growth kinetics, extraction, filtration and centrifugation.

Syllabus for Paper I (Part B) and Paper II Principles of Biochemistry, Molecular biology and Microbiology

BIOCHEMISTRY

Carbohydrates: structure and function (monosaccharides, disaccharides and common polysaccharides – starch and cellulose).

Proteins – primary, secondary, tertiary & quaternary structures; Ramachandran plots

Enzyme: chemical and functional nature of enzymes, Enzyme kinetics

Structure and function of nucleotides, DNA and RNA

Basic metabolic pathways (Glycolysis, TCA cycle, Glyoxalate cycle, Pentose Phosphate pathway).

Biological Membrane: structure and function

MOLECULAR BIOLOGY

Prokaryotic and eukaryotic genome organization

Basic mechanisms in replication, transcription and translation

Gene regulation in prokaryotes: *lac*, *ara* and *trp* operons

Mutations: Types of mutations, Isolation of mutants

Enzymes used in molecular cloning and their applications

DNA sequencing: chemical and enzymatic methods
Southern, Northern and western blotting and hybridization
Vectors: types and characteristic features
Directed evolution

MICROBIOLOGY

Structure and function of prokaryotic and eukaryotic cell
Energy transduction (fermentation, aerobic respiration and anaerobic respiration).
Genetic recombination; basic features of transformation, transduction and conjugation.
Bacteriophages

Syllabus for Paper I (Part B) and Paper II Biochemical Engineering

Fundamentals of growth: Monod growth kinetics; growth cycle phases for batch cultivation.

Fundamentals of sterilization: Thermal death kinetics of cells and spores.

Media sterilization: Concept of degree of sterility and decimal reduction time. Batch sterilization.

Enzyme kinetics: Kinetics of enzyme catalyzed reactions: Michaelis-Menten equation; Lineweaver-Burk plots; Eadie-Hofstee plots; substrate inhibition kinetics; competitive, non-competitive and uncompetitive inhibition; effect of pH and temperature.

Bioreactor kinetics: Batch, fed-batch and continuous (CSTR and PFR) reactors; conditions for "wash-out" and maximum cell production in chemostat cultures. Analysis of rate data for batch/continuous flow reactors and development of rate equation; Introduction to the concept of yield, titer and productivity;

Principles of recovery operations: filtrations, centrifugation, solvent extraction, chromatography.

Suggested Reading

- a) Molecular Biology of the Cell, 4th Edition, by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter, New York: Garland Science; 2002.
- b) Lehninger Principles of Biochemistry, 5th Edition, by David L. Nelson, Michael M. Cox, W. H. Freeman 2008
- c) Microbiology, 7th Ed., by L.M. Prescott, J.P. Harley and D.A. Klein, McGraw-Hill, 2008.
- d) Bioprocess Engineering: Basic Concepts", M.L. Schuler and F. Kargi, Prentice Hall, 1992
- e) Bioprocess Engineering Principles, Pauline Doran, Academic Press, 2013.