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 -80°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 though 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.


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
Convenor, DFB

Distribution
All Faculty (by email)
### Status of Purchases from PLN03

<table>
<thead>
<tr>
<th>S.NO</th>
<th>PFC NO.</th>
<th>PFC. DATE</th>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
<th>BUYER</th>
<th>CHAIRMAN</th>
<th>MEMBER</th>
<th>MEMBER</th>
<th>MEMBER</th>
<th>STATUS (as on Nov 06)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27498</td>
<td>05/09/19</td>
<td>SPARE OF MICRO AND ULTRA FILTRATION UNIT</td>
<td>250000</td>
<td>RJ</td>
<td>AN</td>
<td>ZAS</td>
<td>RJ</td>
<td>Cancel PFC ?</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>27499</td>
<td>05/09/19</td>
<td>SONICATOR</td>
<td>250000</td>
<td>RJ</td>
<td>TRS</td>
<td>RJ</td>
<td>AM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>27500</td>
<td>05/09/19</td>
<td>VERTICAL GEL ELECTROPHORESIS UNIT PLUS POI</td>
<td>200000</td>
<td>PS</td>
<td>RK</td>
<td>PS</td>
<td>RJ</td>
<td>PO issued</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>27501</td>
<td>05/09/19</td>
<td>PERITALTIC PUMPS (order 1)</td>
<td>200005</td>
<td>AN</td>
<td>PKE</td>
<td>AN</td>
<td>ZAS</td>
<td>Item delivered on Nov 05, 2019</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>27497</td>
<td>05/09/19</td>
<td>CENTRIFUGE WITH DIFFERENT ROTORS</td>
<td>1000000</td>
<td>RJ</td>
<td>AN</td>
<td>RJ</td>
<td>ZAS</td>
<td>AM Quotation received for 2.5 lacs !</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>27500</td>
<td>05/09/19</td>
<td>SPARE OF FPLC</td>
<td>550000</td>
<td>SM</td>
<td>AN</td>
<td>SM</td>
<td>PS</td>
<td>RKE Some terms were not clearly defined hence the revised Quotation is awaited by the vendor. 7.5 lakhs</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>27503</td>
<td>05/09/19</td>
<td>CO2 INCUBATOR WITH ACCESSORIES</td>
<td>800000</td>
<td>RK</td>
<td>PM</td>
<td>RK</td>
<td>RKE</td>
<td>AM PO issued</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>27505</td>
<td>05/09/19</td>
<td>AUTOSAMPLER FOR HPLC (SHIMADZU)</td>
<td>400000</td>
<td>ZAS</td>
<td>AN</td>
<td>ZAS</td>
<td>AM</td>
<td>RJ want to cancel ?</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>SPARE OF BIOENGINEERING BIOREACTORS</td>
<td>250000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>UPGRADEATION OF GC-MS</td>
<td>250000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>STI form submitted to DDO for approval</td>
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<tr>
<td>11</td>
<td></td>
<td></td>
<td>3 GAS ANALYZERS</td>
<td>500000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
<td></td>
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<tr>
<td>12</td>
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<td></td>
<td>2 MASS FLOW CONTROLLERS</td>
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<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
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<tr>
<td>13</td>
<td></td>
<td></td>
<td>3 MASS FLOW METERS</td>
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<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
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<td>14</td>
<td></td>
<td></td>
<td>4 DESKTOP PCS</td>
<td>200000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>Purchasing of 1 desktop is under process through GEM (PFC made for Rs. 70000). The other 3 computers are yet to be processed</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>AD/DA TERMINAL &amp; PCI WITH CABLE</td>
<td>140000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td>WATER DEMINERALIZATION UNIT</td>
<td>180000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td>DETECTOR FOR LC-MS AND ACCESSORIES</td>
<td>150000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>Quotation received and file is with Audit</td>
<td></td>
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<tr>
<td>18</td>
<td></td>
<td></td>
<td>PERITALTIC PUMPS (order 2)</td>
<td>200000</td>
<td>AN</td>
<td></td>
<td></td>
<td></td>
<td>PFC yet to be made</td>
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</table>

### Available balance under other different Institute budget heads

<table>
<thead>
<tr>
<th>PLN03/BBCE</th>
<th>Total Allocation by Institute</th>
<th>Amount already settled (A)</th>
<th>Amount committed (B)</th>
<th>Total Expense (A+B)</th>
<th>Available balance (as on Nov 06, 2019)</th>
<th>Available balance as per Anzio (as on Nov 05, 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Allocation by Institute</td>
<td>₹1,15,02,000</td>
<td>₹52,05,036</td>
<td>₹59,30,000</td>
<td>₹1,11,35,036</td>
<td>₹3,66,964</td>
<td>₹22,88,367</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>NPN05/BBCE</th>
<th>Total Allocation by Institute</th>
<th>Amount already settled (A)</th>
<th>Amount committed (B)</th>
<th>Total Expense (A+B)</th>
<th>Available balance (as on Nov 06, 2019)</th>
<th>Available balance as per Anzio (as on Oct 29, 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Allocation by Institute</td>
<td>₹25,36,000</td>
<td>₹91,252</td>
<td>₹24,928</td>
<td>₹16,180</td>
<td>₹17,19,820</td>
<td>₹17,22,144</td>
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</table>

<table>
<thead>
<tr>
<th>PLN05/BBCE</th>
<th>Allocated on 24/07/2019</th>
<th>FACULTY</th>
<th>FUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLN03F/BBCE</td>
<td>Total Allocation by Institute</td>
<td>₹3,00,000</td>
<td>Faculty</td>
</tr>
<tr>
<td>Amount already settled (A)</td>
<td>₹0</td>
<td>RJ</td>
<td>88643</td>
</tr>
<tr>
<td>Amount committed (B)</td>
<td>₹55,400</td>
<td>LCD</td>
<td>99592</td>
</tr>
<tr>
<td>Total Expense (A+B)</td>
<td>₹44,443</td>
<td></td>
<td></td>
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<tr>
<td>Available balance (as on Nov 06, 2019)</td>
<td>₹44,432</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Books allocation</th>
<th>Total Allocation by Institute</th>
<th>Amount already settled (A)</th>
<th>Amount committed (B)</th>
<th>Total Expense (A+B)</th>
<th>Available balance (as on Nov 08, 2019)</th>
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<tbody>
<tr>
<td>Total Allocation by Institute</td>
<td>₹2,72,152</td>
<td>₹0</td>
<td>₹0</td>
<td>₹0</td>
<td>₹2,72,152</td>
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</tbody>
</table>
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