Department of Biochemical Engineering and Biotechnology

Dated: 22 Nov 2013

Minutes of the 5th Departmental Faculty Board Meeting (2013-2014) held on 20th Nov 2013 at 11.30 am in the Departmental Committee Room (I-230). Following members were present:

Prof. T. R. Sreekrishnan	Chairman
Prof. Subhash Chand	Member
Prof. M. N. Gupta	Member
Prof. V. S. Bisaria	Member
Prof. G. P. Agarwal	Member
Prof. Saroj Mishra	Member
Prof. A. K. Srivastava	Member
Prof. P. K. Roychoudhury	Member
Prof. Prashant Mishra	Member
Dr. Atul Narang	Member
Dr. D. Sundar	Member
Dr. Ravikrishnan Elangovan	Member
Dr. Preeti Srivastava	Member
Dr. Ziauddin Ahmmad	Member
Dr. Shilpi Sharma	Member Convenor

1. Confirmation of minutes of 4th DFB meeting (2013-2014) held on 11th October 2013, and special DFB meeting held on 28th October 2013.
   The minutes were confirmed as circulated.

2. Matters arising out of above meeting.
   Item 2, Minutes of 4th DFB meeting
   Head apprised the board that the official letter, awaited from FIST committee, in response to departmental FIST proposal, has not been received yet. Once the same is received the issue shall be taken up in detail in the DFB.

3. Preparation of departmental document for internal review of the department.
   To prepare the departmental document for internal review of the department sections (as per the guidelines received, appended as Annexure I) were delegated to faculty members as follows:

Section No	Section	Faculty in-charge
1 2	Curriculum Teaching Environment	Dr. D. Sundar
3 5	Research R&D Environment	Prof. Saroj Mishra, Dr. R. Elangovan
4	Innovation, Design and Development	Prof. V. S. Bisaria, Prof. G. P. Agarwal
6	Outreach / External stakeholder engagement	Prof. A. K. Srivastava
7	Governance	Head
8	Benchmarking	Prof. Subhash Chand
9	Feedback systems and results	Dr. Atul Narang
10	Vision for next 5-10 years	Prof. Prashant Mishra
11	Information in public domain	Dr. Shilpi Sharma

All other faculty members were requested to be associated with the ones who have been assigned sections as above. It was decided to review the progress in preparation of the document in the next DFB to be held in mid December 2013.

4. Approval of course templates for implementation under the new curriculum.

The following revisions were proposed for the course templates and allocation of duties of preparation of course templates:

- Thermodynamics of Biological Systems (BEL414), Solid State Cultivation (BEL422), and Advanced Biochemistry (BEL724) to be dropped.
- Templates of Analytical Methods in Biotechnology (BEL420) to be prepared by Prof. Saroj Mishra and Dr. Z. Ahmmad as per requirements of core course.
- Template for Carbohydrates and Lipids in Biotechnology (BEL312) to be prepared by Prof. Prashant Mishra.
- Course templates to be revised as per credit structure recommended by DUGS.

5. Comments / feedback on proposal to float new elective course by the Department of Computer Science and Engineering (CSL819 Advanced Distributed Systems).

No comments were received on the course proposal.

6. Comments / feedback on proposal to float new elective course by the Department of Chemistry (CYL698 Food Chemistry and Biochemistry).

An overlap of ~ 30% was observed in the syllabus of the course, with the following departmental courses: BEL101 and BEL720. Head was requested to communicate the same to concerned authorities. *(Act: Head)*

7. Comments / feedback on proposal to float new elective courses by the Department of Mathematics (MAL742 Operator Theory, MAL743 Fourier Analysis, MAL751 Symbolic Dynamics, MAL761 Basic Ergodic Theory, MAL 861 Measure Theory, MAL862 Advanced Applied Analysis).
   No comments were received on the course proposals.

8. Any other item with the permission of the Chair.
   - Prof. Agarwal reiterated that in the benefit of the department all faculty members should process the funds allocated to them (for the current financial year) from the Planning and Furniture grants of the Institute as early as possible.
   - In view of the strong relation between IITD and Newcastle University in research, teaching and knowledge transfer in the form of various scientific exchanges Prof. T. R. Sreekrishnan and Dr Z. Ahmmad's proposal for an MoU between the two institutes was approved by the board.
   - Prof. A. K. Srivastava presented the compiled of list of obsolete equipments of the department (Annexure II) for forwarding to DBT. All faculty members were requested to revise the list keeping in mind the budget and the urgency of procurement.

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

Shilpi Sharma

Convenor

All Faculty members

ANNEXURE I

GUIDELINES FOR PREPARING THE INTERNAL REVIEW REPORT OF AN ACADEMIC UNIT FOR THE ACADEMIC REVIEW

1. Curriculum

1.1 List of degree programmes offered - UG + PG - and enrollment.

1.2 Consistency of curricula with academic vision of the department.

1.3 Quality of programmes:

(a) Periodicity of curriculum review UG and PG (*relevant documents*).

(b) Mechanism for review at UG and PG level (*relevant documents*).

(c) Coursework for each UG, PG and PhD programme - Core / Elective.

(d) Pre PhD courses offered (*in last 5 yrs*).

(e) New advanced Masters / Pre-PhD courses introduced in last 5 yrs.

(f) Overlap between courses (c) and (d) & (e), including opening latter to UG.

(g) Seminar series (weekly/regular) held each semester (*provide list*).

(h) Placement details (*as per format at Annexure-1*).

(i) Relevance of UG and programmes to recruiters, potential and on-campus recruiters (*as per format at Annexure-2*).

(j) Benchmarking of curriculum (*as per format at Annexure-3*).

2. Teaching environment

2.1 Student-Teacher ratio separately and total for UG, PG, PhD (based *on gross numbers and on class size basis*)

2.2 No. of students graduated in each programme, incl. PhD, (*data for 5 yrs*)

2.3 Student-T.A. (or student-hours/T.A.) ratio

2.4 No. of skilled technical staff

2.5 Gross laboratory space; break-up of lab space for core UG / PG teaching

2.6 Laboratory modernization performed in last 5 years for (i) UG core, (ii) PG core, (iii) elective courses (*attach data before and after modernization),*

2.7 Course files for each course for last 5 years

2.8 Study materials (monographs, notes, books, videos, web-based materials, etc.) prepared, course-wise,

2.9 Research and Innovations in teaching-learning processes

2.10 No. of students (UG and PG separately) who have spent at least a semester at another university/institute (overseas or Indian).

2.11 No. of students from overseas universities who have taken classes, done project work or internship, UG & PG separately, in the department.

2.12 Course feedback.

2.13 Industry experts who have delivered lecture(s), seminars, discussions as part of a core/elective course – UG and PG separately.

2.14 Industry exposure to students – course-related visits to factories, sites, industry exhibitions, field trips, etc. – UG and PG separately.

3. Research

3.1 No. of Masters and Ph.D. students supported - (i) by Institute Assistantship, (ii) on sponsored projects/consultancies, (iii) others sources and (iv) sponsored by external organizations.

3.2 No. of Ph.D.s enrolled, graduated per faculty for last 5 years

3.3 Areas of research (e.g. areas listed in Prospectus, and others) by (i) Volume (quantifiable parameters), (ii) Breadth, and (iii) Years these have been research areas (*as per format at Annexure-4*).

3.4 Publications per faculty (average per year for last five years) in academic journals.

3.5 Publications (journal and conference) total and per (a) Ph.D. student, (b) Masters student, (c) UG student.
3.6 Best papers in last 5 years: (i) Individual best 3, (ii) department/centre best 10; and brief justifications.
3.7 Average citation per department/center.
3.8 Changes, modifications, etc. done to improve the quality of (i) M.Tech., and (ii) Ph.D. graduates.
3.9 Sponsored projects - (i) individually, (ii) with another faculty of the group/section of the department, (iii) with another faculty of the department but from another group/section of the department (iv) with another faculty of another dept/center.
3.10 Industry consultancies
3.11 New areas of research which are different from the faculty's PhD thesis area.
3.12 Methodology for (i) identifying obsolescence in research areas, and (ii) identification of new areas for future research.
3.13 Number of large interdisciplinary projects (within department's areas, and across the institute).

4. Innovation, Design and Development

4.1 No. of students who have been funded for innovating (TePP, PRISM, etc.).
4.2 Technology developed (*give list and brief information*).
4.3 Technology transferred (*give list and brief information*).
4.4 Number of patents filed and patent granted as a fraction of patents filed.
4.5 Innovations of products, processes, designs, etc. in the department.
4.6 Availability and access to students' workshops, "tinkering laboratories" so that they may pursue their own ideas.
4.7 No. of students/teams who have competed in national / international competitions, and outcome.

5. R & D Environment

5.1 No. of post-doctoral scholars hired in the department/centre and their durations, from (i) abroad, (ii) on project, and (iii) others, and outcomes.
5.2 No. of foreign students enrolled in (i) Masters, and (ii) PhD programmes.
5.3 No. of Indian and foreign faculty/researchers who have spent a sabbatical in the department.
5.4 Sabbatical taken by faculty and where spent.
5.5 Number of seminars (education and research separately) given by the faculty (i) in the department, (ii) in other departments, (iii) at other institutions.
5.6 No. of faculty/researchers/scholars invited by the department for giving (i) seminars, (ii) spending at least a week in the department.
5.7 No. of faculty/researchers who visited the department on their initiative for giving (i) seminars, (ii) spending at least a week in the department.
5.8 Adequacy of research infrastructure.
5.9 Adequacy of technical staff – existing numbers and competency areas; competency areas in which there is a shortage.
5.10 Work space available for (a) Masters students, (b) Ph.D. students, (c) project staff, (d) post doctoral scholars.
5.11 No. of national conference/workshops/seminars attended by PhD students (*total and per student for 5 years*).
5.12 No. of international overseas conference/workshops/seminars attended by PhD students (*total and per student for 5 years*).
5.13 No. of students who have continued to Ph.D. (i) in same dept., (ii) other departments of IITD, (iii) in India, and (iv) abroad (separately for M.Tech. and B.Tech. students).
5.14 No. of projects with co-guide from industry
5.15 No. of students who have spend time in industry as part of thesis/project work (give number and duration).

5.16 Self assessment reports of the department/centers/schools if any.

5.17 Placement of M.Tech. and PhD graduates in technical careers (*as per format at Annexure-5*).

5.18 Inter-disciplinary work -: (i) joint thesis guidance by faculty across groups within a department, or across departments/centres, (ii) Proposals submitted and funded – PI-CoPI and their group/department affiliations.

6. Outreach / External stakeholder engagement

6.1 Educational

(a) Workshops/Short term courses – topical research for disseminating research of IITD.

(b) Workshops/Short term courses – educational methods (teaching, learning resources, pedagogy).

(c) Learning, research material on the website.

(d) Science & technology for public information – on website.

(e) Courses taught to students of other IITs/NITs/Other institutions.

(f) Courses taught via NKN.

(g) Courses developed for NPTEL.

(h) Books, monographs, study material made available outside IITD.

(i) Experiments developed and made available to other institutions.

(j) Seminars live/via NKN, web to other institutions in India/abroad

(k) Reach out to schools, NCERT, KVs, etc. (e.g. K-12 programmes).

(l) Mentoring of other institutions, e.g. new IITs, NITs, universities, etc. including faculty mentoring, curriculum development, laboratory development, etc.

6.2 Industry collaboration

(a) No. of students (Ph.D./Masters) directly linked to industry funded projects.

(b) No. of industry staff/engineers who have taken a regular course(s) for entire semester.

(c) Technology transfer to companies, entrepreneurs, local and other governments/government agencies, NGOs (separately).

(d) Continuing education/courses for industry.

(e) Faculty secondment to industry.

(f) Research projects undertaken with industry as partner.

(g) Laboratories, equipment, etc. provided by industry for use in UG / PG teaching laboratories and student projects.

(h) Seminars/workshops held with industry by the department.

6.3 Professional

(a) Service as Board, Senate, selection committee member at other IITs, NITs, and Universities.

(b) Service as Ph.D. thesis examiner at other institutions.

(c) Service as technical expert on committees - MHRD, DST, DSIR, DRDO, Pan-IIT initiatives, other ministries, state and local governments.

(d) Technical expert on policy, regulatory, laws, standards committees.

(e) Member of Board/Advisory Board of public and private sector corporations.

(f) Positions (e.g. Director, Vice Chancellor, etc.) held by faculty on lien.

6.4 Contribution to national development goals

(a) Projects undertaken and their outcome.

(b) Policy inputs – implications, visible impact on society.

(c) Entrepreneurship development.

6.5 Alumni engagement

(a) Regular interactions / engagement with alumni and outcomes.

(b) Contributions from alumni.

6.6 Recognitions and Awards

(a) Awards to faculty.

(b) Fellows of academies, INAE, etc.

7. Governance

7.1 Governance

(a) Organization structure – their autonomy/ terms of reference

(b) Planning documents developed by the department – space, faculty, staff related.

(c) Records of discussions within the department – internal documents (meeting minutes, position papers, discussion papers, concept papers, etc.)

(d) Physical resources – percentage utilization for UG PG core and electives teaching separately, UG and PG student projects, Ph.D. student research. Projections for future.

(e) Financial resources – (i) funds provided to the department, (ii) processes of distribution, (iii) funding for focus areas, (iv) funding for UG and PG core teaching laboratories. Outcomes of funds utilization. Changes in funding pattern and funds utilization, and effects on departmental strategy.

(f) Delegation of decision making within department/centre. List the processes and structures for financial and academic management, and the methodology for their review.

7.2 Department management and operations

(a) Organization structure - mandates, flexibility, etc.

(b) Processes for curriculum planning.

(c) Processes and methods for teaching resources management.

(d) Guest faculty, affiliation for teaching core, elective UG & PG courses.

(e) Faculty short-listing criteria.

(f) How collectiveness of the faculty has enhanced academic output and enhanced quality, etc.

(g) Nature, quantum and quality of support from of secretarial staff, stores and inventory management, purchases, ambience, etc.

7.3 Faculty

(a) Faculty profile, and a critique of the same.

(b) Diversity in faculty profile by: (i) gender, (ii)category, (iii) region, (iv) Ph.D. institution, (v) post-doctoral institutions worked in, (v) organizations/industry worked in, (vi) employment prior to joining the department.

(c) Procedure for faculty searches.

(d) Result of faculty searches – area-wise (as in Annexure IV), number of applicants, short-listed and offered a position, their educational qualifications & experience.

(e) Success in recruitment (data for last 5 years), and offers that the persons had from other IITs/IISc/TIFR.

(f) Faculty lost to other institutions post selection.

(g) Faculty time utilization – in class, in meetings, project management, Ph.D. guidance, Masters project guidance, UG project guidance.

(h) Level of harmony amongst department faculty.

7.4 Students

(a) Criteria for short-listing and selecting students for admission to Master's and Ph.D. programmes of past 5 years.

(b) Facilities provided to students and their maintenance/management system.

(c) Mentoring seminars/sessions held for Ph.D. students for prospective faculty careers.

8. Benchmarking

8.1 Identify departments/centres within IITD as peers.

8.2 Identify departments/centres/schools/divisions from other IITs, IISc, NITs, private universities as peers, and reasons/criteria there for.
8.3 Identify departments/centres from institutions in other countries as peers.
8.4 Define parameters for benchmarking (i) research, (ii) curriculum - separately for UG, Masters, and Ph.D. programmes, (iii) teaching-learning processes.
8.5 Perform benchmarking and report the analysis/findings for the last 5 (or 10) years.

9. Feedback systems and results

9.1 System for feedback from UG students and its results.
9.2 System for feedback from PG, Master's and Ph.D., students, and their outcome.
9.3 System for feedback from recruiters (i) on-campus, and (b) off-campus - separately for UG and PG graduates; and the results.
9.4 Mechanism of obtaining industry feedback and the findings.
9.5 Alumni feedback mechanism and its outcome.
9.6 Placement records – Ph.D., M.Tech. and B.Tech..

10. Vision for next 5-10 years

10.1 Goals and benchmarking for future in relation to (i) curricula, (ii) research, (iii) outreach, and (iv) processes for regular internal assessment.
10.2 Vision of curricula and teaching-learning processes - UG, PG and Ph.D.; innovations proposed.
10.3 Areas identified for improvement in (i) curriculum, (ii) teaching-learning processes.
10.4 New areas for research and Masters programme, and industry participation in these.
10.5 Projections for (i) funded projects, (ii) journal publications.
10.6 Projected graduation numbers - Ph.D., M.Tech. and B.Tech.
10.7 Projected faculty profile, and areas for recruitment of faculty.
10.8 Projections for future benchmarking (for comparison after 5 years) – institutions in India and abroad, and parameters for future comparison.
10.9 Infrastructure and governance - limiting factors that affect achievement of benchmarks and methods to overcome these.
10.10 Working with other departments/centers and institutions in teaching and research.
10.11 New initiatives that the department/centre will undertake.
10.12 Outreach goals and anticipated limitations in the attainment of these.
10.13 Mechanisms for effective changes based on feedback received and development and implementation of corrective measures.
10.14 Questions to which the department seeks answers from the Review Committee.

11. Information in public domain

11.1 Minutes of all meetings.
11.2 All reports archived in the central/department/centre libraries.
11.3 Past vision documents, review documents, Standing Review Committee documents.
11.4 Any other documents developed by the department, a group/section of the department/centre.
11.5 Feedback documentation and action taken on the same, and its outcome.

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ANNEXURE II

List of Equipments as replacement of obsolete equipments for Process Lab

S. No.	Name of Equipment	Quantity	Approx. Cost (INR)
1	Optizen 3200 UV Spectrophotometer (Purchased in 2008)	1	5 Lakhs
2	Julabo Circulating bath (Purchased in 2004)	1	3 Lakhs
3	pH meter (2004) & (2010)	2	1.2 Lakhs
4	Weighing Balance (Sartorious) Purchased in 2002	1	1.2 Lakhs
5	Air Compressor (Purchased in 1982)	1	1.0 Lakhs
6	Biostat C fermenter (Purchased in 1994)	1	25.0 Lakhs
7	UPS 5 KVA (Purchased in 1997)	1	1.8 Lakhs
8	Biostat B fermenter (Purchased in 1994)	1	25.0 Lakhs
9	Viscometer (Purchased in 1995)	1	2.0 Lakhs
10	pH, DO probes for the Applikon Bioreactor	2	1.5 Lakhs
11	pH,DO probes for Bioengineering fermenter	2	1.5 Lakhs
Total			68.2 Lakhs

List of Equipment as replacement of obsolete equipments for Plant Cell culture lab

S. No.	Name of Equipment	Quantity	Approx. Cost (INR)
1	Julabo Circulating bath (Purchased in 2005)	1	3 Lakhs
2	pH, DO probes for the Applikon Bioreactor	1	1.5 Lakhs

Proposed List of Equipment as replacement of very old models (obsolete) for Downstream Processing & Instrumentation Laboratories

S. No.	Name of Equipment	Quantity	Approx. Cost (INR)
1	Cold Cabinet (with temperature controller)	1	2,00,000.00
2	Shaking Water Bath	1	3,50,000.00
3	Incubator-Shaker (cooling & heating)	1	3,50,000.00
4	Mini Centrifuge (2ml, 12 well,)	1	1,50,000.00
5	Refrigerator (380Lit.)	1	60,000.00
6	pH meter (pH, conductivity, ion selective)	1	1,50,000.00
7	Weighing Balance	1	1,20,000.00
8	Magnetic Stirrer	2	1,00,000.00
9	Gear Pump	1	2,00,000.00
10	Fine air regulator	2	1,80,000.00
11	Autoclave (adequate safety measures)	1	2,00,000.00
12	Chiller for fermenter	1	3,00,000.00
13	Air Compressor (oil free)	1	60,000.00
14	UPS 2 KVA	1	1,50,000.00
15	High end configuration Computers	2	1,50,000.00
16	Spectrophotometer with multiple cells &Peltier	1	10,00,000.00
17	Peristaltic Pumps	2	6,00,000.00
18	Milli Q Water Purification System	1	6,00,000.00
19	HPLC with Autosampler	1	25,00,000.00
	TOTAL	23	**74,20,000.00**

Dr. Shaikh Ziauddin Ahammad

S.No.	Items	Lab	Qty	Price (approx.) Lac
1	Benchtop centrifuge having rotors for 50 ml (12 places) and 15 ml (18 places) tubes @12000 rpm	WTL, Bioseparation II	2	6
2	Laminar flow chamber	WTL/Metagenomics	1	1
3	Data station for GC	WTL , Instrumentation	2	1.5
4	Water Bath	WTL, Metagenomics, Bioseparation I	3	2
5	Fume Hood	WTL	1	1
6	Hot air oven	WTL	1	0.6
7	Drying Cabinet	WTL, DSP	2	1.2
8	COD tube digester for 24 tubes	WTL	1	1
9	Cold water Circulator	WTL/DSP	1	3
10	Vertical Freezer	WTL, Metagenomics	2	1.6
11	Fridge	WTL, DSP, Bioseparation	3	0.6
12	Cold Cabinet	DSP	1	3
13	Shaker Incubator	WTL, DSP	2	4.4
14	Magnetic stirrer with temp control	WTL, DSP	4	3.2
15	pH meter	WTL, Metagenomics	2	0.8
16	Microcentrifuge (24 places for 2 ml tubes)	WTL, Bioseparation II	2	1.2
17	Cross flow membrane system	Bioseparation II	2	2

18	Stirred Cell	Bioseparation II	2	2.5
19	Plate and Frame filter	Bioseparation II	1	3
20	Rotary Vacuum Filter	Bioseparation II	1	4
21	French Press	Bioseparation II	1	5
22	RO system higher capacity	Bioseparation II, WTL	2	0.6
23	RO system	BioseparationI	1	0.2
24	Centrifuge having rotor for 15 ml tubes (18 places) @12000 rpm	Bioseparation II	1	1.2
25	Double distillation water system (membrane based)	WTL, Bioseparation II	2	4
26	Peristaltic Pump (low flow rate -3, High flow rate -3)	WTL, DSP	6	6
			Total	**60.6**

Dr. Atul Narang

S.No.	Items	Lab	Qty	Price (approx.) Lac
1	Old chiller	Bioreaction Engg Lab	1	1
2	Old ice-maker	Bioscience		
			Total	

Dr. Prashant Mishra

S.No.	Items	Lab	Qty	Price (approx.) Lac
1	UV vis spectrophotometer (Spectroscan 50 V (Purchased in 2006)	Bioscience Lab		
2	Microscope with imaging system (Motic Microscope with imaging system Purchased in 2004)	Bioscience Lab		
3	Table top centrifuge (ROTA 4R Centrifuge Purchased in 2007)	Bioscience Lab		
4	UV Spectrophotometer (Optizen 3220 UV bio purchased in 2008)	Enzyme Engineering Lab		
			Total	