

Department of Biochemical Engineering and Biotechnology

Dated: 21st March 2013

Minutes of the 5th Departmental Faculty Board Meeting (2012-2013) held on 15th March 2013 at 12.00 noon in the Departmental Committee Room (I-230). Following members were present:

1.	Prof. T. R. Sreekrishnan	Chairman
2.	Prof. Subhash Chand	Member
3.	Prof. V. S. Bisaria	Member
4.	Prof. G. P. Agarwal	Member
5.	Prof. Saroj Mishra	Member
6.	Prof. A. K. Srivastava	Member
7.	Prof. Sunil Nath	Member
8.	Prof. Prashant Mishra	Member
9.	Dr. Atul Narang	Member
10.	Dr. D. Sundar	Member
11.	Dr. Ritu Kulshreshtha	Member
12.	Dr. Ravikrishnan Elangovan	Member
13.	Dr Preeti Srivastava	Member
14.	Dr. Shilpi Sharma	Member Convenor

1. Confirmation of minutes of 4th DFB meeting (2012-2013) held on 9th Jan 2013 and special DFB meetings held on 21st Feb 2013 and 6th March 2013.

The minutes were confirmed as circulated as there were no comments received on the same.

2. Matters arising out of above meeting.

- *Item No 9:* With respect to Dr Ravikrishnan's email regarding departmental Ph.D selection, it was decided a special DFB meeting be held in April 2013 before the next selections for Ph.D. are conducted.

3. Courses to be offered in Semester I, 2013-2014

The courses to be offered in Semester I, 2013-2014 was discussed and finalized in DFB as attached in Annexure I. Time Table In-charge was requested to kindly forward the same to the Time Table Committee. Also, Prof. Bisaria suggested that BER350 be coined as BER351 and

BER352 for first and second semesters respectively, with the latter having pre-requisite of BER351. **(Action: Time table I/c, DBEB)**

4. Discussion on departmental requirements of funds for the financial year 2013-2014.

Based on the requirements put forth by individual faculty members, the departmental budget projection for financial year 2013-2014 was compiled as Annexures II (PLN03) and III (NPN05) to be communicated by the Head to the Planning Unit. **(Act: Head)**

5. Creation of departmental vision document.

The subcommittee's draft on departmental vision document was discussed and finalized (Annexure IV). The Head was requested to communicate the same to Director, IIT Delhi.

(Act: Head)

6. Discussion on recommendations made by PG Curriculum Review Committee.

The board was of divided opinion with respect to the introduction of Self-study component. While some faculty members suggested reduction in number of lectures upon introduction of Self-study component, while others requested no change in ongoing course structure, and emphasis on Independent Study at the PG level. The Head was requested to communicate the same to the Office of Dean Academics. **(Act: Head)**

7. Comments / feedback on proposal for starting M.S. (Res) Programme in School of Biological Sciences.

The proposal put forth was discussed by the board and the following comments made:

- The M.S. programme from IITs has been considered equivalent to a Masters in an engineering programme. Hence the name M.S. in biological sciences does not appear appropriate. Programme should be in line with that of other science departments e.g. M. Sc. Degree programme.
- The value addition to a candidate already having an M.Tech / M.E. degree by pursuing the programme needs to be highlighted.
- In research areas, terms like systems biology, functional biology, metabolic engineering need to be replaced by specific and identifiable areas.
- SBL750 (Quantitative Biology) appears to be a mix of Molecular Cell Biology and Bioinformatics. This needs to be designed in a manner where various biological processes are

understood in a quantitative manner such as growth, chemical reactions, flux through metabolic pathways etc.

- The lecture hours for SBL750 (Quantitative Biology) and SBL751 (Chemical and Molecular Foundations of Cell) seem to be interchanged.
- SBL751 (Chemical and Molecular Foundations of Cell) has ~23-25% overlap with BEL204 (Molecular Biology and Genetics) based on lecture topics.
- In SBL711 (Cell Signaling) emerging techniques like antisense, RNAi, omics, mutations systems approach etc. (topic 12) needs to be emphasized further by increasing the number of lectures hours presently allotted.
- SBL712 (Dynamics of Infection Biology) has >60% (~64%) overlap with BEL412 (Immunology). Moreover the course does not have practical component that BEL412 has.

Head was requested to communicate the same to Deputy Registrar (PGS&R). **(Act: Head)**

8. Comments / feedback on proposal to float new elective course by the Department of Humanities and Social Sciences (HUL703 Agrarian Societies and Rural Development, and HUL731 Perspectives on Development in India)

No comments were received on the course proposal.

9. Comments / feedback on proposal to float new elective course by Applied Mechanics Department (AML736 Multiscale Modelling of Crystalline Materials)

No comments were received on the course proposal.

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

- Head nominated Dr Praveen Kaul and Dr. Ravikrishnan Elangovan as departmental representatives for Ninth I2Tech-Open House 2013 on 20th April, 2013.
- Head informed the board of the call for nomination for “Prof. G N Ramachandran Gold Medal for Excellence in Biological Sciences & Technology” and requested interested faculty members to proceed with the formalities as the last date for the same is 31st May 2013.

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

Shilpi Sharma
Convenor

All Faculty members

Annexure I

Courses to be offered by DBEB in 1st Semester 2013-14

Slot	Course Code	Description	L-T-P	Course Credits	Coordinator/ Associated Faculty
P	BEC 450	Colloquium	0-3-0	3.0	PK/RK
P	BED 800	Major Project	0-0-80	40.0	AN
P	BED 851	Major Project – Part 1 (BB)	0-0-12	6.0	RK
P	BED 852	Major Project – Part 2 (BB)	0-0-28	14.0	RK
P	BED 853	Major Project – Part 1 (BB)	0-0-8	4.0	RK
P	BED 854	Major Project – Part 2 (BB)	0-0-32	16.0	RK
E	BEL 101	Biochemistry	3-1-3	5.5	PM / PS
F	BEL 103	General Microbiology	3-0-3	4.5	VSB / SS
C	BEL 110	Molecular Cell Biology	3-0-0	3.0	SS / TC
C	BEL 301	Bioprocess Engineering	3-0-0	3.0	AN
E	BEL 403	Enzyme Engineering and Technology	3-0-2	4.0	PK / SC
D	BEL 412	Immunology (DE 4)	3-0-2	4.0	RK
H	BEL 413	Modeling and Simulation of Bioprocesses (DE 5)	3-0-2	4.0	AKS
F	BEL 416	Membrane Applications in Bioprocessing (DE 5)	3-0-0	3.0	GPA
C	BEL 701	Biotechnology Resource Planning	2-0-0	2.0	PK / SC
B	BEL 714	Protein Science and Engineering (PE 3)	3-0-0	3.0	SM / DS
D	BEL 715	Biological Waste Treatment (PE 4)	3-0-2	4.0	TRS / ZA
B	BEL 717	Animal Cell Technology (PE 3)	3-0-2	4.0	PKRC
D	BEL 719	Current Topics in Biochemical Engg and Biotech (PE 4)	3-0-0	3.0	PS / PK
J	BEL 722	Genomics & Proteomics (PE 5)	3-0-0	3.0	DS / PS
H	BEL 810	Enzyme and Microbial Technology	3-0-0	3.0	RE
J	BEL 820	Downstream Processing	3-0-0	3.0	GPA / AN / ZA
F	BEL 830	Microbial Biochemistry	3-0-0	3.0	SM
E	BEL 850	Advanced Biochemical Engineering	3-0-4	5.0	TRS / ZA
N	BEN 150	Introduction to Biochemical Engineering and Biotechnology	0-0-4	2.0	TRS
F	BEP 303	Design of Bioprocesses	0-1-3	2.5	RE
P	BEP 840	Laboratory Techniques in Microbial Biochemistry	0-0-4	2.0	PM
E	BER 350	Professional Practices (BB)	0-1-2	2.0	VSB
P	BES 350	Independent Study (BB)	0-3-0	3.0	VSB
P	BET 450	Practical Training (BB)	0-0-0	0.0	AN / DS

Note: The first name in the last column is the Coordinator for the course.

Annexure - II

Request of Funds under PLAN head for the year 2013-2014 (PLN03)

S. No	Item	COST (in ~)	Location of proposed equipment	Faculty Member(s) involved	Purpose
1	Bioreactor (2) 1500000 + 250000 (+probes)	1500000	Bioseparation / Process Lab	RE / AN / AKS	BEL403, BEP303, BEL850, BED851-854,
2	PCR cycler with back up (3)@ 600000	1800000	RNA Lab I / Metagenomics, BRL	PS / SS / SM	BED851-854, BEL711
3	Kjeldahl Eqp	1500000	WTL	TRS	BEL715, BED851-854
4	CHNOS Analyser	2600000	WTL	TRS	BEL715, BED851-854 BEL403, BEP303, BEL850, BEL204, BED851-854, BE412, BEL711, BEL 420 BED851-854, BEL204, BEL412
5	Refrigerated centrifuge (2) 800000 + 400000	1200000	RNA Lab-II, Bioseparation, BRL	AN / RK / RE / SM	BEL717, BED851-854, BEL412
6	Gel Doc	456000	RNA Lab-II	AN / RK	BED851-854, BEL204, BEL412
7	ELISA reader (1) Vertical gel electrophoresis with heating	400000	Animal Cell Culture	PKRC	BEL717, BED851-854, BEL412
8		350000	Metagenomics	TRS / SS	BED851-854
9	Gel Dryer	330000	RNA Lab-II	AN / RK	BEL204, BED851-854, BEL412
10	PAGE apparatus	80000	RNA Lab-II	AN / RK	BEL204, BED851-854, BEL412
11	Electroblotter-Semidry	200000	RNA Lab-II	AN / RK	BEL204, BED851-854, BEL412
12	Gel rocker	75852	RNA Lab-II	AN / RK	BEL204, BED851-854, BEL412
13	Voltage stabilizer	40000	Enzy Engg Lab	PM	BED851-854
14	Peristaltic pumps (3)	300000	Process Lab	AKS	BED851-854
15	Julabo Chilled water Circulator (1) Stirrer Controller for Biostat C (3:7 liter)	300000	Process Lab	AKS	BED851-854
16	dry bath (1)	250000	Process Lab	AKS	BED851-854
17	Polarimeter	125000	RNA I	PS	BED851-854
18	Biosafety Unit (filters)	800000	Pilot Plant	PK	BED851-854, BEL419
19	RI detector (2)	150000	Instrumentation	AKS	BED851-854
20	Plasma cleaner	1200000	molecular machine lab	AN / AKS	BED851-854
21		370000		SN	BED851-854

22	20 freezer	80000	molecular machine lab	SN	BED851-854
23	HPLC Columns: Chiralcel ODH column, Crownpak CR+ column, Chiral AGP column	600000	Instrumentation	PK	BED851-854, BEL419
24	RI detector adapter for FPLC	67000	Instrumentation	AN	BED851-854
25	Sonicator	234000	RNA Lab II	AN	BED851-854
26	Lead bricks (1Set= 52 Nos.) & bin	115000	Radioactivity	AN	BED851-854
27	Safety equipments for radioactivity & personal monitoring badges: Digital Pocket Dosimeter, Pen Dosimeter	130000	Radioactivity	AN	BED851-854
28	membrane filtration units	400000	downstream processing lab	GPA	BED851-854, BEL820
29	Other small equipments, viz timer, water bath, RO unit, vacuum pump, oven, computers, UV torch, gun pipette	275000	Process Lab, RNA Lab I, II, Bioscience	PS / AKS / AN / VSB / PM	BED851-854
30	Weighing balance for small amounts	200000	RNA Lab I	PS	BED851-854
31	autoclave (small)	40000	RNA Lab I	PS	BED851-854
32	Cool Cabinet / fridge (2)	40000	RNA Lab I / Process Lab	PS / AKS	BED851-854
33	FPLC	2700000	Instrumentation / BRL	SM	BEL420
34	16 GB RAM computer for rapid image acquisition and processing	400000	molecular machine lab	RE	BED851-854
35	1 watt 532nm Laser	400000	molecular machine lab	RE	BED851-854
36	High NA Objective	400000	molecular machine lab	RE	BED851-854
37	RO Unit	15000	Process lab	AKS	BED851-854
38	Regulators : Hydrogen, Air, Nitrogen	30600	Process lab	AKS	BED851-854
39	Spectrophotometer	400000	Process lab	AKS	BED851-854
40	UPS	200000	Animal Cell Culture	RK	BED851-854
41	Atomic Absorption Spectrometer	4500000	Instrumentation	GPA	BED851-854
42	HPLC with auto sampler	2500000	Instrumentation	GPA	BED851-854
43	Centrifuge spares & repair	500000	Pilot Plant	AKS	BED851-854
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1	pH meter	25000	I-232A	AKS	COE
2	Balance	80000	I-232A	AKS	COE
3	Physical Balance	10000	I-232A	AKS	COE
4	Gas cylinders : Hydrogen, Air, Nitrogen @ 12,500 each	50,000	I-232A	AKS	COE

	Regulators : Hydrogen, Air, Nitrogen					
5	@ 7200 each	30,600	I-232A	AKS	COE	
6	Laminar Flow	60000	I-232A	AKS	COE	
7	Rotary evaporator	65000	I-232A	AKS	COE	
8	Fridge	30000	I-232A	AKS	COE	
9	Oven	30000	I-232A	AKS	COE	
10	Incubator 24"x24"x 24"	30000	I-232A	AKS	COE	
11	Autoclave	40000	I-232A	AKS	COE	
12	Microwave oven	5000	I-232A	AKS	COE	
13	RO Unit	15000	I-232A	AKS	COE	
14	Solvent chamber	30000	I-232A	AKS	COE	
15	UV-Vis Spectrophotometer	400000	I-232A	AKS	COE	
TOTAL		900600				

Annexure - III

Request of Funds under NON-PLAN head for the year 2013-2014

For the Laboratory courses

	Course Code	Description	~ # of students	Total (in lacs)
Semester 1	BEL101	Biochemistry	48	0.5
	BEL103	General Microbiology	48	0.5
	BEL403	Enzyme Engg. & Tech	48	0.5
	BEL412	Immunology	40	0.5
	BEL413	Modeling & Simulation	30	-
	BEL715	Biol Waste Treatment	35	-
	BEL717	Animal Cell Tech	25	1.0
	BEL850	Advan Biochem Engg	15	0.5
	BEP303	Design of Bioprocess	48	0.5
	BEP840	Lab Tech Microb Tech	10	0.5
Semester 2	BEL204	Mol Biol & Genetics	48	0.75
	BEL419	Enz Cat Org Synthn	25	0.5
	BEL418	Bioinformatics	25	-
	BEL702	Bioprocess Plant Design	48	-
	BEL703	Downstream Process	48	0.5
	BEL711	Recomb DNA Tech	20	0.75
	BEL712	Plant Cell Tech	20	0.75

For Dual Degree Students Major Project Research

Total number of students who will pursue MTP	Budget per student (` In Lacs)	Total (in lacs)
32	0.5	16

For MS(R) Research

Total number of students for MS(R) Program	Budget per student (` In Lacs)	Total (in lacs)
6	1	6

For PhD Research

Total number of students for PhD program	Budget per student (` In Lacs)	Total (in lacs)
46	1	46.0

Annual Maintenance Contract (AMC) of Equipments	5.0
Miscellaneous Office Operating Expenses	3.0
Total budget requested under NPN head (` In Lacs) =	83.8

Annexure – IV

Department of Biochemical Engineering and Biotechnology

Vision document

The past few decades have seen a major, rather revolutionary, change in our knowledge regarding life forms and our ability to manipulate biological systems. This has translated into major strides in 'Biotechnology', with far-reaching impact on diverse areas such as health-care, diagnostics, agriculture, food, environment and consumer products. These biotechnical innovations are meaningless until and unless their benefits percolate down to the common man. This can happen only if such technologies are taken up for industrial scale production.

The Department offers a unique blend of scientific expertise in applied biological sciences, chemical and biochemical engineering. It strives for application of this expertise to evolve various biotechnological products, processes and services.

It is envisaged that such a **mission can be achieved through:**

- Generation of highly trained human resource capable of quantitative analysis of biological systems to facilitate their role in manning modern bioprocess industries and provide an integrated approach to research and development in biotechnology.
- To continue to evolve research and development programmes to develop products and provide services in bioenergy, environment and therapeutics.
- Leading global innovations in Bioprocess Technology and Applied Biological Sciences, and facilitate participation in industrial consulting and sponsored research.
- Dissemination of knowledge generated through short term courses, workshops and conferences.

Some of the **focal areas of research** of the department are:

- Bioprocess Engineering
- Cell and Molecular Biotechnology
- Downstream Processing
- Systems and Computational Biology

Stronger faculty interactions and collaborations within department are envisaged.

Teaching:

- Increased student strength (especially in Ph.D. and M.S(R) programmes) is targeted.
- Introduction of new courses bridging biological and engineering sciences is planned.
- Development of 8 semester B.Tech programme and 4 semesters M.Tech programmes
- Proposed areas for M.Tech level programmes:

- Biochemical Engineering and Biotechnology
- Environmental Biotechnology

International Presence:

- Transfer of knowledge created in the department through short-term courses, workshops and conferences at national & international levels to society at large.
- Participation in competitions on international platform
- Collaborative research programmes with internationally acclaimed institutes and Universities
- Exchange programmes for students and faculty members with Universities and Institutes of international repute having common mandates

Faculty recruitment:

Targeted recruitment (e.g. Bioprocess Engineering, Cell and Molecular Biotechnology, Downstream Processing, Systems and Computational Biology) corresponding to newer proposed programmes. Each area of teaching and research is planned to be strengthened by recruiting faculty in respective areas.

Industrial collaboration:

- To carry out research & development for any national industry in the area of biotechnology or pharmaceutical technology.
- To design joint projects with the industry where our students are engaged.