

Department of Biochemical Engineering and Biotechnology

Dated: 30th July 2014

Minutes of the special Departmental Faculty Board Meeting (2014-2015) held on 11th July 2014 at 10.30 am in the Departmental Committee Room (I-230). Following members were present:

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

1. Discussion the report of internal review committee.

The report of the internal review committee was discussed extensively with the following feedback/comments/action plan:

We are glad to note that the committee agrees with us on all the actionable points listed on Page 4 of Executive Summary of Internal Review report. Action on these items was initiated well before the Institute initiated the internal review process.

OBSERVATIONS AND RECOMMENDATIONS

Observations

- Students waste a lot of time in ordering and interacting with vendors

Department has already taken proactive measures to streamline the procedure for ordering and interacting with vendors with minimal student involvement. However, it has been noted that most of the problems are associated with vendors not getting their payment in time. Many times it has been noted that well known

companies (such as Sigma Chemicals, USA) have stopped supply of chemicals due to the lack of payment in time. Institute needs to look into this matter and may frame a general policy for clearing the payment and inform the same to PI/Buyer in a time bound manner.

- Basic computing infrastructure needs improvement

The Board is aware of the fact that the computer facilities need to be strengthened further, in all laboratories. Work has been initiated to equip every teaching and research lab. The Institute's support is sought in this respect.

- No AMC policy in place. Equipments down for a very long time

It is agreed that AMC is needed for all major equipments but the Institute's recurring grant has been a limiting factor. We have ensured that new equipments are procured with AMC. However due to limited funds it has not been possible to include all equipments under AMC coverage. A separate head in the budget for AMC renewal and newer AMCs is needed.

- Less Intra Department as well as Inter Department interaction between faculty.

Faculty board discussed this issue and wanted to know the bench mark as it is difficult to understand the committee's view point in this regard. An elaborate account of Intra- and inter departmental interactions that the faculty members have been involved in, in the form of joint projects, supervision of students, and the course taken, had been provided in the Review Document and is reiterated in the following two tables:

Intra-departmental Interactions in terms of joint supervision of doctoral students

Student	Faculty supervisor	Departmental co-supervisor
Sk. Ziauddin Ahammad Kankana Kundu	T.R. Sreekrishnan	James Gomes Shilpi Sharma
Jitendra S. Verma Nivedita Patra Guneet Kaur Ashish Baldi	A.K. Srivastava	T R Sreekrishnan Shilpi Sharma Subhash Chand V S Bisaria
Anees Kaprakkaden M. V. R. K. Sarma Vinod Kumar	V.S. Bisaria	Preeti Srivastava Vikram Sahai Vikram Sahai
Siddhi S.	P.K. Roychoudhary	Z.Ahammad
Tenzin Kenzom Swati Ojha Meenu Chhabra Mohd. Younis Rather	Saroj Mishra	Preeti Srivastava Subhash Chand T R Sreekrishnan Subhash Chand
Satyendra Singh	G.P. Agarwal	T R Sreekrishnan
Abhinav Grover	D. Sundar	V. S. Bisaria
Rashi Gupta Richa Sharma Gautam Anand	Shilpi Sharma	V S Bisaria V S Bisaria V S Bisaria
Neha Nagpal Rahul Agrawal	Ritu Kulshrestha	P K Roychaudhury P K Roychaudhury
Khusboo Rastogi Vidhu S	R. Elangovan	Sunil Nath Sunil Nath

Inter-departmental Interactions in terms of joint supervision of doctoral students

Student	Faculty supervisor	Inter departmental co-supervisor
Vikrant Sarin Shukla Pal Kapil Kumar Asheesh K. Yadav Ashish Pathak Dinesh K Upadhyay Isha Pushap Chawla Arpita Ghosh	T. R. Sreekrishnan	K.K.Pant, Chemical Engg S.K.Gupta, Chemical Engg M.G.Dastidar, Energy Studies Santosh Satya, CRDT M.G.Dastidar, Energy Studies Mukesh Khare, Civil Engg R.P.Dahiya, Energy Studies Anushree Malik, CRDT M.G.Dastidar, Energy Studies
P. K. Sofia	A. K. Srivastava	V K Vijay, CRDT
Naresh Mohit VS Saurabh Bansal Roohi Gupta Prabha Arya	Prashant Mishra	A. Mittal, KSBS B.Kundu, KSBS A. Mittal, KSBS B. Kundu, KSBS
Benu Monga Joyeeta Mukherjee	M N Gupta	S K Khare, Chemistry
Ashwani Kumar Mohd. Asif Shah	Saroj Mishra	Satyawati Sharma, CRDT T K Chaudhury, KSBS
Aji Alex	Ritu Kulshrestha	Veena Koul, CBME
Saurabh Singh Vikas Pandey	R. Elangovan	Vivek P, KSBS Shalini G, Chemical Engg
Deepak Gola	S. Z. Ahammad	Anushree Malik, CRDT

Number of large interdisciplinary projects (within department's areas, and across the institute).

Faculty Name	Joint PhD student (within department)	Joint Project (within department)	Joint PhD student (outside department)	Joint Project (outside department/institute)
M .N. Gupta	0	4	2	0
T. R. Sreekrishnan	2	4	4	5
A. K. Srivastava	1	1	0	1
V. S. Bisaria	2	5	0	2
P. K. Roychoudhary	2	0	0	1
Prashant Mishra	0	4	4	1
Saroj Mishra	4	4	1	1
Sunil Nath	2	1	0	0
G. P. Agarwal	1	2	0	3
Atul Narang	0	1	0	1
D Sundar	0	3	0	3
Shilpi Sharma	4	4	0	0
Ritu Kulshrestha	2	1	1	2
Ravikrishnan E	2	1	2	1
Preeti Srivastava	2	1	0	1
S. Z. Ahammad	1	1	5	1

- Lack of interaction with administration.

The Faculty board is not clear as to what is implied by this observation. We would like to state that the departmental faculty members are involved in various levels of Institute's administration in the capacity of important positions such as Professor-in-charge Library, National Coordinator of INDEST-AICTE Consortia, Dean IRD, Chairman Registration and Grades (UG), Chairman Registration and Grades (PG), Associate Dean (UGS), Associate Dean (Student Affairs), Vice- Chairman (JEE), Hostel Wardens, and House Masters. In fact, considering the total faculty strength, we have one of the highest level of involvement in the administration.

- Underutilization of space.

The Board disagrees with this observation. The department conducts large number of wet lab courses every semester. Besides, it is noteworthy to mention that the infrastructure, which was initially created for an intake of approx. 25 students, is now being used to accommodate 60 students. There is absolutely no "unused space" in the department. In fact the department is facing massive space crunch with the increased number of UG students. Due to specialized nature of our teaching program more newer labs need to be developed and equipped. The department is renovating the existing space primarily to reclaim more working space for additional students and newer laboratories. Also due to safety requirement some empty space is mandatory surrounding the high pressure vessels.

- Several laboratories need reorganization. Small Silos created over the years.

One of the reasons for creating smaller labs was because different faculty members are working on different biological systems such as bacteria, fungi, plants and animals. To avoid contamination, each biological system requires a separate lab. Also, AC space was restricted to those areas where climate control was absolutely essential. Most of our labs are being shared by faculty members working in the same area.

- Lack of leadership in DBEB. Need change in Leadership.

The basis of this comment was not clear to the faculty board. An elaborate mention is needed to respond to this issue. In fact, during the interaction of the Department's faculty with the Internal Review Committee members, it was specifically pointed out by the faculty that the current leadership of the Department is extremely helpful as well as pro-active in facilitating all Departmental activities. It is really surprising to note that the Committee has come up with a comment totally negating that.

- Academic performance below par

The Review committee has not mentioned about the bench-mark used to arrive at this comment. In the absence of a comparison of the DBEB faculty's academic performance (quantitative data in terms of publications, projects, teaching and other research outputs) with that of other Departments/Centres/Schools of IIT Delhi as well as Biochemical Engineering/Biotechnology Departments of other IITs/reputed national and international Universities, this statement is meaningless.

- Requirement for more consumables. Purchase procedures need improvement

The board strongly agrees to the point raised by the committee. The department is under pressing need for recurring grants. This is despite the fact that all faculty members actively bring funds through extramural projects, with budgets much higher than the Institute's contribution to the recurring head. Budget allocation to the department should not be based on a formula which takes into account only the number of students registered, thereby resulting in departments like humanities, and social science (with no requirements of lab consumables) being allocated more than departments such as ours with a large wet lab component. Also, almost all the Major Projects are experiment-based. Most of the chemicals and consumables used in these laboratory exercises are very expensive and consume the whole of the Non-Plan grant allocated. We barely make ends meet by chipping in from sponsored project funds and a teaching program grant (HRD Grant) from Department of Biotechnology, Govt. of India.

- Teaching is Archive.

The board presumes the committee meant "Archaic".

Almost half of the faculty strength in the department is just a decade past award of its PhD degree, and so the question of archaic teaching does not arise. It is true that content of some courses is decades old. But the committee will probably agree that just like in other departments, some fundamental part of course (mostly covered in Core courses) needs to be covered before moving on to more specialized and modern topics. In fact students of DBEB need to understand basic concepts of Chemical Engineering, Biochemical Engineering and Biology before learning new advanced courses.

In its constant drive to maintain its standard, the entire curriculum of the department has been recently revised to keep pace with the changing scenario and to bring in newer topics, together with deleting old ones. Besides, newer electives have also been proposed in the curriculum review held recently.

- Younger faculty under performing.

It is strange to note that without giving any benchmark such comment has been made.

The faculty presumes that this is arising out of an unsubstantiated statement made by Prof. Anurag Rathore of Chemical Engineering Department, IIT Delhi, who was the internal member in the Committee. This statement by Prof. Rathore was challenged by the then Head, DBEB, right in front of all the Committee members and was also conveyed to the concerned authorities. As a faculty member from another Department of IIT Delhi, such statements are uncalled for and when they are unsubstantiated with data, needs to be tagged as 'malicious'. We have recently submitted the achievement of younger faculty to the Director, IITD, which clearly indicates their academic excellence. The committee seems to have completely missed reading the pages documenting the achievements/publications of the young faculty. It is an unacceptable statement particularly when most of the young faculty members have clearly "outperformed" their colleagues from other Department who joined at the same time. The young faculties not only have publications in high ranking International Journals that have been featured elsewhere, but also have attracted several

grants from various National and International Funding Agencies (DST-UKIERI, ISCB, GII British Council, EPSRC, UK). Research works of young faculty members are highlighted by different national and international news agencies (Nature India, TOI, HT, BBC, UK) which surely show the competency of the young faculties. Prestigious awards such as DuPont Fellow, Young Scientist Awards, Innovative Young Biotechnologist Award etc. presented to the younger faculty speak volumes about the performance of younger faculty members.

- **Laboratory safety - an issue across all the three entities**

The board supports the point unconditionally. This is an aspect which cannot be neglected any further. All major renovations ongoing in the department are being done with special emphasis on maintaining international standards of lab safety. This has to be taken up in a big way across the institute. To meet the international standards of lab safety, a dedicated fund should be allocated to each of the units by the Institute

- **Placement record very poor- hardly any jobs in the CORE sector in the DBEB**

The dual degree programme offered by the department is a highly specialized course feeding mostly for higher studies like doctoral programmes. Over the last few years the department has witnessed a significant increase in the number of students pursuing higher studies after completion of their degree. Regarding jobs in core sector, the hard fact is that the industry's salary has not kept up with the market. Many of our students who have taken up core jobs have not found the salary and the job profile challenging enough to continue. Though many of our students are employed by top notch core biotech companies, we have no control over external environment.

It is worth mentioning here (which the Committee perhaps did not notice) that due to emphasis of the department on entrepreneurship, two of our M Tech students are now entrepreneurs in biotechnology area; one has already started his company and the other is on the verge of starting- these young and dynamic entrepreneurs will offer additional employment opportunities to our biotech students.

- Hands on experience in the laboratories missing. Students do not learn much in the laboratories.

Department is aware of need of hands-on experience and importance of lab experiments. Due to increased number of students, Department has proactively started developing new UG Lab almost a year back. These labs will be available for conducting experiments from next semester onwards.

Recommendations

- DBEB-CBME to be co-located.

The recommendation comes to the board as a surprise. The idea of co-locating two units distantly apart, not just in the list of courses conducted by the two but also by the divergent expertise of faculty members of the two units, is not at all reasonable. Faculty members of neither of the two units are competent enough to contribute, in any way, to the teaching component of the other unit. With unrelated mandates of these units, the co-location of the two units will in no way benefit either of them. Faculty board felt that the Review Committee has neither seen the expertise of faculty members nor they are aware of senate approved mandate of Department/Centre/School. It is important that senate approved mandate must be revisited before taking any other route. Also, the faculty board feels that the review committee over-stepped its brief in making such a recommendation. Creation/abrogation of a Department/Centre/School at IIT Delhi is an internal matter of IIT Delhi and has well-laid out procedures for doing this. Recommendation from the internal review committee is not part of that procedure.

The institute has in place a document, prepared only about six years ago, on the roles of departments and centres. This has to be used for making any re-organization of the departments/ centres/schools.

On the other hand, the more obvious suggestion for co-location would have been of DBEB and KSBS. In fact the KSBS is an off-shoot of the department, with four of our faculty members being the founder members of KSBS. Two of the outgoing members are (Bio)chemical Engineers while the other two are biologists. Even after six years of the official genesis of the School, some of their faculty members are enthusiastically involved in teaching our courses. We would request the committee to give this overlap a serious thought.

In the interest of the Institute and these three units, it is desirable to create a centralised space with all major equipment from the three units to be available as common facility open to the three units. DBEB would happy to share such an arrangement. This even has a larger implication, wherein across the Institute all scientists working in biology can have a common platform to work.

- Productivity of the department (as measured by number of papers published and other metrics) is below expectation. Department to look into this seriously.

The board would like to know the yardsticks used by committee members. Our productivity had been compiled in the report presented.

- Teaching to be made more effective and less stressful. Students should be imparted soft skills training that will make them effective team workers and leaders in their profession.

Though the introspection related to our teaching's standards is ongoing, we are not clear of the expectations of the review committee and logic of their conclusion to the above remark. We have a teaching feedback from our students for each course for improving our teaching rather than falling back on unsubstantiated remarks.

- Faculty must be encouraged to meet their peers abroad to generate new research ideas and work on joint collaborative research projects.

In past funding has been received from Internationally well known companies / organisations such as Lockheed Martin Corporation, USA, Indo Swiss Collaboration in Biotechnology (ISCB) (jointly by DBT and Swiss Agency for Development & Cooperation), GII, British Council, EPSRC, UK, DST-UKERI to carry out joint collaborative research projects. Under ISCB project, in which 3 Swiss and 3 Indian institutes were involved for about 6 years, a biofertilizer product has been developed and the technology of its production has been recently transferred to a large industry. The Department is also involved in an Indo-US project on secondary biofuels with five other labs and three companies from US. The Department also has a long-standing collaboration with the University of Newcastle upon Tyne, U.K., in the area of Environmental Biotechnology. We have successfully completed an EPSRC funded project involving IIT Delhi, Newcastle University and Glasgow University. Currently we are working together with Newcastle University in a British Council sponsored

Global Innovation Initiative (GII) project with UMBC, U.S.A and UFMG, Brazil, as the other partners.

We shall constantly strive to continue the trend and venture into more such fruitful international collaborations.

- Attempts should be made to attract foreign students and also hire post doctoral students to carry out research in advanced areas.

We are pleased to have a German scientist in the department for the last two years. Researchers (Post-doc), PhD and Masters students from UK regularly visit the department for their PhD research work / Masters dissertation under the supervision of the faculty members of the department. We hope to attract more such researchers and the Institute's help in this aspect is sought. This is to meet the basic logistic requirements of foreign scientists.

- Faculty should regularly visit institutes of repute to motivate students to join the Department for Ph.D.

We are in the process of re-designing our brochures and working towards wider awareness of our in-house expertise so as to attract motivated students for departmental PhD programme.

- Technical staff must be regularly trained to handle new equipment. In addition, the centre should also look at their promotion policies.

The Faculty board agrees with the committee's recommendation. Though our staff members are given trainings as per the need of the hour, this will be taken up proactively. As mentioned in our executive summary there is acute shortage of skilled Technical Assistants.

- Ph.D. students to be given international exposure. Master level students to be encouraged to publish papers in peer reviewed journals and conferences.

Each PhD student of the Institute gets the chance to present his/her work on an international platform once during the programme. Moreover, we have witnessed some reputed fellowships bagged by our students, like DAAD, Indo-French scholarship etc., which has given them a splendid opportunity to interact with their peers abroad. The work of M. Tech. and M.S.(R) students has been published .

- The department seems to have a lot of space at their disposal but the space is poorly utilized due to large number of scattered laboratories and of inactive equipment. Department to look into this.

As explained above (Pg 5).

- The Committee observed that large sections of the faculty, in particular most of the new faculty, were not performing as per expectations. The department needs to address this issue and ensure that the new faculty gets the expected support from the department resulting in their smooth transition and productive beginning.

As explained above (Pg 7 & 8).

- Teaching labs need a major update. Old equipment should be written off and new equipment and experiments need to be added to make the lab courses reflect the biotechnology of today.

The review committee was apprised of the fact that new teaching labs were already under construction and will be functional from Jan 2015. It should also be noted that the entire curriculum has undergone changes to keep up with the pace of science and development. This includes upgrading lab components, purchasing newer equipments and writing off old ones.

- Entrepreneurship needs major encouragement amongst the students. Department should give some thought to the possibility of including such courses as part of their curriculum.

The Department is trying to promote entrepreneurship in all possible ways. In a start-up by our alumni, department has offered lab space and other infrastructural facilities to budding entrepreneurs (alumni of the department). This is one of the focus areas for us in the coming years.

- The department needs to reassess their curriculum and make it current as well as pertinent to today's world. As per student feedback, a significant number of courses are being taught in a manner that has been the same for the past 2 decades.

As stated above (Pg 7)

General observations and Issues

1. The Committee feels that the three academic units should be co-located as there is a considerable overlap in their equipment and hence, sharing of the infrastructure and equipment will greatly benefit the students. The committee also felt that given the nature of (overlapping) of the two units namely, Dept. of BE&BT and centre of Biomed Engineering, IIT may consider a merger of the two units. However, it was felt that the third unit, The School of Biological Science, while co-located, may operate separately as a unit, for teaching and carrying out research in basic biological services.

As stated above (Pg 9)

The last sentence, which is written without any reason being attached to it, exposes the pre-conceived notion and intention of the committee. Why such a “benevolent” attitude towards KSBS? The faculty board strongly objects to such statements by the committee and feels that it is beyond the committee’s mandate.

2. Industry participation was minimal across the board. It is recommended that the units be asked to focus on this along with IIT administration. Hiring a qualified project manager for each unit such that this person has the requisite skills (MBA-preferably) and can interface between the academic unit and the concerned industry. He/she will play an important role in initiating the thought process of attracting private funding for research through active industry participation. Other key roles of this person could be budget and IP management for the department and for key projects.

The board strongly agrees to the suggestion put forth. We have taken the following initiatives to promote the interaction with industries: organising industry-specific workshops, joint extramural projects with industrial partners, joint M.Tech and M.S.(R) projects in collaboration with the industry. We also welcome institutional support in implementing in hiring of a project manager who can be a liaison between DBEB and the biotech industry.

3. Entrepreneurship needs major encouragement amongst the students. The units should give some thought to the possibility of including such courses as part of their curriculum. Hiring of the above mentioned project manager is also likely to alleviate this issue.

As mentioned above (Pg 8 & 12).

4. Procurement of chemicals and equipment must be made electronic. Current system suffers from two major problems. First, a lot of time of faculty and students gets spent on purchasing. Second, the time it takes to accomplish these purchases is too long presently (3-4 months for chemicals and 6-9 months for equipment) resulting in major inefficiencies. This was the single most important issue raised during our interactions with students and faculty, and clearly the most serious one.

As mentioned above (Pg 1 & 2).

5. Reliable supply of utilities (electricity, water etc) needs to be put in place.

Institute should take urgent action for providing uninterrupted electricity (in house independent electricity generation units), water etc. This is one of the specific needs of Department as frequent failure of electricity results in loss of chemicals stored in – 80 and experimental materials prepared after month long hard work.

6. Reliable mechanism for the management and disposal of radio-active waste needs to be put in place. This must be taken up urgently.

We are actively involved in managing our bio-wastes and radioactive wastes. Institute should urgently put up the management plan in place for disposal of chemical and other organic waste.

7. Equipment installation, maintenance, and management needs to be carefully examined. High end analytical equipment should be moved to a central facility, assigned trained manpower and should be made accessible to all faculties.

In fact we propose moving high end equipment of CBME, KSBS and DBEB to a central facility with clear cut policy of operation of these equipment.

8. The Committee felt that the technical cadre for managing laboratories and key equipment is missing. The existing non-teaching staff appeared to be suffering from a lack of training and motivation.

We are glad to note that the committee agrees with this point which was stated in our review report. Technical assistants recruited directly by the department have been performing very well. However, as per institutional norm, many lab attendants were

promoted to lab superintendents despite lack of basic understanding. There is urgent need of qualified technicians with clear cut promotional policy in place so that they can be entrusted with technical duties.

Specific Recommendations

1. The Committee felt that the productivity of the department (as measured by number of papers published and other metrics) was below expectation.
2. The department seems to have a lot of space at their disposal but the space is poorly utilized due to large number of scattered laboratories and of inactive equipment.
3. The department needs to attract more PhD students. The number of PhD students that have been hired in the last 5 years seem to be particularly low.
4. The Committee observed that large sections of the faculty, in particular most of the new faculty, were not performing as per expectations. The department needs to address this issue and ensure that the new faculty gets the expected support from the department resulting in their smooth transition and productive beginning.
5. The department needs to reassess their curriculum and make it current as well as pertinent to today's world. As per student feedback, a significant number of courses are being taught in a manner that has been the same for the past 2 decades.
6. Teaching labs need a major update. Old equipment should be written off and new equipment and experiments need to be added to make the lab courses reflect the biotechnology of today.

These six points have been answered at appropriate places above.

*Besides these specific comments / feedback, the board had some **general feedback** on the report of the internal review committee*

*• For a flourishing department with historical leadership in Biochemical Engineering, with seventeen scientifically productive faculty members from varied research areas, and with a reputation of producing world class biochemical engineers, just to name a few, **the review committee did not have a single encouraging point**, or words of appreciation. The committee is totally silent on the academic achievements of the Department, compiled and given to it in 170 typed pages. The report, other than pointing out few critical issues, majorly reads like a “complaint list”. The Board felt that Internal Review committee has made*

recommendations without clarifying their rationale (as evident from suggesting merger of two unrelated units).

- *Throughout the report levels and standards are being talked of without setting up **the benchmark for performance**. Department fails to understand the usefulness of the committee.*
- *There was no external member in Biochemical Engineering specialization from an academic institute, which was surprising. Further, the Chairman of the Committee was absent on the first day (and had no interest in knowing the relevance of biochemical engineering in development of biotechnological products and processes in general, and contributions of the department, in particular) while another member was absent on the second day. This speaks about the seriousness of the Committee to the assigned task!*

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

Shilpi Sharma
Convenor

All Faculty members