

A Report on Internal Review of the Department of CSE, IIT Ropar (Jan 30-31 2014)

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Computer Science and Engineering is at the core of any Institution and has significant overlaps and influences on other departments as well. The CSE department in IIT Ropar has made a good beginning with clear vision about its role and is on the right track and aspires to be one of the leading departments in the country in near future. The faculty is engaged in conducting a high quality intensive CS undergraduate program, carrying out edge research in diverse areas of Computer Science and Engineering, mentoring PhD students, as well as establishing linkages with industry and participating in IT initiatives in the local context. It is creditable that with such a constrained faculty size, the department has successfully graduated two UG batches in 2012 and 2013.

A more detailed assessment on some relevant metrics is given below

1. **Academic Programmes** The department is running a four year BTech programme with a state-of-the-art curriculum (closely abiding by the ACM recommendations) having a good mix of theoretical and hands-on education. The graduating students have been recruited by the leading Computer Science/IT industries as well as some Multinationals. Placement records reflect a very encouraging trend as all the graduating students have received good offers.

The Committee was happy to note that the department has made arrangements to provide special help for the weaker students.

Recommendations for Future

- (a) Introduce Masters program initially as MS(R) (thesis intensive) including part-time and also allow high-performing four year BTech students to switch to a dual-degree BTech-MTech programme. Typically a dual degree student needs 5-6 courses to obtain an MTech degree and a more elaborate MTech thesis. An MS program and a dual-degree program will not require significant increase in teaching responsibility and allow some students to potentially contribute to research and teaching (as RAs and TAs).
 - (b) Introducing one credit modules to facilitate short term visitors to teach courses and also allow own faculty to introduce new material before starting a new course.
 - (c) Enhance further the model of online courses and courses taught at other good institutions using video links/NKN.
2. **Infrastructure Development** The department is currently maintaining multiple teaching labs for undergraduates and PhD students.

Recommendations

- (a) For future expansion of IT support like Cloud and High Performance Computing, the Department (and more generally the Institute) should explore involving a professional IT Company (like TCS, Wipro) so as not to further distract the already over-burdened faculty.
- (b) Reach out to IIT Delhi Computer Services Center, that has been able to build some impressive in-house IT infrastructure in recent years.

- (c) Start planning an ERP system to simplify and lessen administrative burden.
3. **Research** Despite a small size faculty, they are extremely dynamic in pursuing research in diverse areas including Multi-processor Scheduling, Geometric Algorithms, Neuroimaging, Cloud Computing, Data Mining, Big Data, Knowledge Discovery, Social Networks, Software architecture, and Cyber physical systems. All the faculty have PhD students who are making good progress.

Recommendations

- (a) Introduce part-time PhD program in view of local industry in Chandigarh.
 - (b) Allow joint research guidance for students enrolled in other institutions.
 - (c) Encourage faculty to engage in inter-institution research projects with a large component to support travel.
 - (d) Approach some of the leading IT-CS companies to set (using MoU) to set up endowments supporting this. Further the same companies may be encouraged to support International travel of faculty and PhD students.
4. **Faculty Recruitment** The department is actively looking out to hire young and talented faculty and have already done multiple rounds of faculty selection through advertisements. The faculty retention has also been very good (unlike some of the other new IITs) and only one person had left after joining.

The most challenging aspect of any institution building is the recruitment of adequate number of quality faculty who stay with the system for decades and play a critical role in defining the image of an university. Attracting talented, research-oriented faculty to a new institution is not easy in the initial years of any institute and it becomes an even bigger challenge for industry-favourable discipline as Computer Science. Maintaining the right balance between the immediate needs of high teaching commitments without compromising on the quality is a very difficult decision. To achieve this, IIT Ropar must explore alternate models of faculty induction who may not necessarily stay in the institute on a permanent basis but nevertheless play an important role in institution development. may be pursued.

Recommendations

- (a) Identify strong and talented teachers in neighbourhood institutions like PEC, who are willing to teach courses. This alleviates some teaching burden from an undersized faculty and lets them focus more on research.
- (b) Contact retired and experienced faculty from other IITs/IISc who are willing to spend time here as Visiting faculty/ Adjunct Faculty or under inter-IIT faculty exchange programme.
- (c) Institute Chair Professorship for attracting eminent researchers who can come as long term Visiting faculty on sabbatical from their parent institutions.
- (d) Facilitating faculty exchange programs between IITs/IISc.
- (e) Set aside some dedicated funds to support frequent visits for IIT Ropar faculty to visit and collaborate with researchers within india and in turn invite them to spend time in Ropar. This should include senior PhD students from other institutes who may then seriously consider joining IIT Ropar as Assistant Professor.

5. **Innovation and Industrial Collaboration** The department has a total funding of over 1 crores to support faculty members pursue their research interests including a project on Technology Incubation and Development of Entrepreneurs from the Department of Electronics and Information Technology.

Recommendations

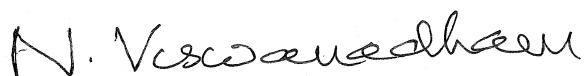
Faculty members of the department can engage with local industry and government agencies for identifying opportunities for consulting/project collaboration, for example in the areas of agriculture, local 4. Pharmaceutical industry, healthcare and smart-grid for power conservation. There is also an opportunity to do joint projects with PEC, IISER Mohali and nearby NITs at Jalandhar, Hamirpur and Kurukshetra.

However, these activities should be pursued if it is aligned with the research activities of the faculty.

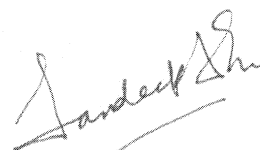
General Recommendations for Faculty Welfare

The review committee encourages the faculty and staff members to plan for an IIT Ropar Housing Society. This plan could be pursued with the state government for acquiring the necessary land. Each faculty and staff member could be allotted a plot in the housing society.

IIT places numerous demands on the faculty in terms of teaching, research, student mentorship, admission process, creation of infra-structure. We feel that that the IIT Ropar administration could meet the faculty using open open house sessions to address the common concerns.



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