TEQIP Discussion on Materials and Metallurgy Curriculum

8 – 9 October 2015

Faculty Feedback on Curriculum Development

Workshop

Questions	*Excellent*	*Good*	*Ordinary*
Effectiveness of discussions	27	5	
Duration of workshop	13	19	
	Definitely	***Maybe***	***No***
Would you like to have more such sessions?	25	7	
Would you like e-lectures by experts on special topics?	25	4	2
Suggest specific topic that you would like additional expert lectures on	➢ Computational Approach in Metallurgy ➢ Deformation behaviour of alloy ➢ Advance Materials ➢ Iron & Steel making/ Mechanical Metallurgy ➢ Compositional analysis, Spectoscopy, Image analysis ➢ Functional Materials ➢ Teaching and Learning Methods ➢ Functionally graded materials ➢ Thermodynamics, Computational Techniques in metallurgy, Extraction processes ➢ Technologically important materials ➢ Entrepreunuship in materials Engg. ➢ Science and Engineering design ➢ Super alloys and their fabrication		
Additional Suggestions	➢ Hands-on training on characterization equipment at IIT Kanpur ➢ Invite stake holders like Alumni/Industry/ Students ➢ Hold a joint workshop for common courses for UG ➢ Some courses partly or fully taught by other departments, course contents to be regulated by metallurgy department ➢ Homogenerating the courses ➢ More institutiona should be encourage to participate ➢ Aspects of Materials Engineering		

Teaching

Which subjects do you teach?	➢ Material models and simulation, Phase transformation. ➢ Principles of extraction and refining, Transport phenomena, Met. Kinetics, Electrochemistry. ➢ Materials process, Grain boundaries, Dislocation and Plasticity. ➢ Physical science, Heat Treatment. ➢ Iron Making, Computational Methods, Process Modelling Kinetics. ➢ Solidification of Metals and Alloys, Continuous casting of steels. ➢ Powder Metallurgy, Eorrosion Engineers. ➢ Manufacturing and Metallurgy. ➢ Electrometallurgy and Nanomaterials process application. ➢ Electronics Engineering Materials. ➢ Physical Metallurgy and Corrosion. ➢ Metal Forming Technology and Metal Processing technology. ➢ X-RD, Mech. behaviour of materials, Crystallography, Extractive Metallurgy. ➢ Physics of Materials and Joining of Metals. ➢ Machine Design, Tribology, Condition monitoring. ➢ Mineral processing and foundry. ➢ FFR and Principles of Meta extraction.
What is average student to teacherratio in your institute?	➢ 1:20 ➢ 1:30 ➢ 1:15 ➢ 1:65 ➢ 1:75 ➢ 1:25 ➢ 1:5 ➢ 1:45 ➢ 1:60

Questions	***YES***	***NO***
Do you have additional support forteaching (tutors, graders, teachingAssistants, etc)?	20	13
Do you have this subject as a full course in your Institute in the UD curriculum?	31	2
Do you have this subject as a full course in your Institute in in the PG curriculum?	18	11
Do you think this subject is important for all engineering branches?	19	12

Is a lab associated with the subject in your institute?	26	6		
Do you give class projects for UGclasses?	21	10		
Do you give class projects for PGclasses?	23	8		
Do you have sufficient resources forlaboratory courses?	28	5		
	Sufficient	***Inadequate***		
Is the library/journal/e-connectionsupport adequate?	17	10		
	Definitely	***May* be**	***No***	
Would you like to have common(TEQIP) repository of coursematerial?	25	6	1	
Would you like to visit IITK toparticipate in and develop coursematerial (existing or new)	27	6		
Would you like to participate increation of the repository material(course files/lab. Manuals/questionbank/etc)	23	10		
	e-courses	***Workshops***	***Content***	***none***
How can IITK effectively help youprepare for teaching?	21	23	8	2
How can TEQIP help improve yourteaching?	19	22	5	1

Suggestions

Name the engineering branches for which you consider this subject to be a necessary part of curriculum.	➢ Metallurgy and Materials Engineering. ➢ Electrical Engineering, Electronic Engineering, Civil Engineering, Mechanical Engineering ➢ Chemical Engineering ➢ Production Engineering, Ceramics Engineering ➢ Heat Treatments, Mechanical Design ➢ Aerospace Engineering ➢ FEM- Mechanical, Chemical, Metallurgy & Civil Engg. ➢ Fatigue & Fracture- Mechanical & Metallurgical Engg.

Give suggestions for changes in the curriculum to make the subject useful across engineering branches	➢ Firstyear courses need to have more emphasis on engineering mathematics. ➢ Introduction to lab and tutorials. ➢ Introduction to project assignment and technical paper/research paper discussion in class. ➢ More elective papers should be included in course structure. ➢ Focus on scientific concepts and quantitative approach. ➢ Cannot have a universal course on materials. It has to be branch specific. ➢ As discussed during workshop Materials science as a course should be taught to all branches and the curriculum should be prepared according to the branch concerned. ➢ More session on syllabus design and teaching materials design. ➢ Advanced materials should be included apart from regular extraction courses. ➢ These courses do not act across other engg. branches. ➢ Further meeting may be required for content of individual subjects. ➢ The subject of Tribology in multi disciplinary in nature. ➢ Chemical/chemistry , Materials engg. specifically need an introductory course in this subject must be adversed.

Any other suggestions.	➢ Reinforcement of faculty through new recruitments. ➢ Advanced materials and their applications may be introduced at 11^{th} and 12^{th} std to introduce about materials. ➢ Separate groups should be formed to make syllabus and course contents. ➢ Long duration program on the similar area. ➢ More interactive sessions should be included. ➢ Invite regular lectures from top faculties. ➢ Member from industry should also be a part of such kind of exercise. ➢ Other departments should discuss the application in metallurgy/materials engineering. ➢ There needs to be a balance between teaching and research. ➢ Expert from physics, chemistry and mathematics to be invited in future to correlate the corresponding subjects with materials engineering. ➢ A committee of eminent metallurgists should be set up to ask the G.O.I as to what is their future plan regarding metallurgical industry and how should we change ourselves in order to meet their requirements. ➢ Regarding the course of Mech. Metallurgy and joining of metals courses 6^{th} and 7^{th} semester there must be work practice instead of lab work of above said courses. Because students does not get enough equipments/tools in labs and not able to do practice of such courses practically.

Research

Questions	***Definitely***	***Maybe***	***No***
Would you like to visit an IIT for a visiting-faculty/ post-doctoral fellow, if offered(viaTEQIP)?	21	8	1
Would you like to share/use research infra-structure at IITK, if made available?	26	4	1
Would you like to conduct collaborative research with IITK?	27	3	1
Would you like lectures by experts (Indianand international) on niche researchareas/topics?	25	4	
Do you want special-topic conferences?	24	7	

How can TEQIP help improve your research?	➢ Through discussion with different experts of the country in diverse area of research interest. ➢ Our institute lack some infrastructure since presently we are not a part of TEQIP program we may avail the infrastructure from TEQIP institute. ➢ This can improve research activities by collaborations among IIT's and NIT's. ➢ By organizing more such events. ➢ Helping with research facilities. ➢ Interaction with peer resources for the students. ➢ Through sharing of equipments facility. ➢ Academia-Academics as well as Academia-Industry interactions. ➢ Development of special lab facility. ➢ Faculty development program. ➢ TEQIP funds are always helpful for organizing research with the help of funds available. ➢ The department facilities for doing research need to be upgraded at MANIT, Bhopal. ➢ We still are lacking in some facilities for metallographic specimen preparation . Also we would be provided training on characterization equipment. ➢ Funding for research and organizing workshop and conferences. ➢ Procurement of laboratory equipments. ➢ By providing e-tenders and avail facilities in other colleges. ➢ Interaction with pioneers from top institutes in their respective fields their lectures.