

Design/Practical Experience

(Implementation guidelines for five non-graded units to be earned by all UG students)

Preamble

In the new curricula (starting from 2013 entry students), it is mandatory for all UG students to earn 5 non graded units of Design/Practical Experience as graduation requirements. Objective of this non graded core requirement component is to give opportunities to students to acquire substantial design and practical experience both as a part of formal courses as well as in an informal setting. Second and even more important objective of this course is to inculcate design thinking among students and facilitate them to gain some design immersion experience.

Objective of Design/Practical Experience component is to promote *learning by doing* which does two important things: it allows students to immerse themselves in the environment in which work is to be done, so that they can understand the values and expectations of the target beneficiaries. Secondly it enables a fresh look at problems, not only at the ways of defining them, but also at the ways to solve those including skill-sets that are required to address them. A shift from problem based learning (acquisition of knowledge) to project based learning (application of knowledge), where the projects are grounded in problems outside the classrooms and labs in everyday scenarios, will involve students in reality, and reality in education. Design and Practical Experience bridges division between the curricular and the co-curricular, and encourage the curiosity and involvement that issue from total absorption in a subject of interest.

Design/Practical Experience activities need not be restricted to design of physical products but must also include system level design and experience. For example a team of students who under the supervision of faculty in collaboration with an NGO, would like to design a new financial inclusion system for marginalized section of population too can be considered as a means earn design/practical experience units.

Implementation

These units can be earned in multiple ways during the semester as well as during vacation period. Institute, departments and centers will specifically identify and designate a set of courses and activities which will provide students opportunity to earn these units. Student will be declared to have completed Design and Practical Experience units after he/she earns total of 5 units. This is analogous to earning credits under humanities, environmental courses etc.

Some of the suggested ways by which design/practical experience can be acquired are as follows:

1. Specialized Elective Courses related to Design and Practical Experience (Maximum 2 Units)

Departments and centres will offer a basket of elective courses which will not have any credits associated with them but will have only Design and Practical Experience units linked to them. In other words successful completion of these courses will not give any credits to students but only design practical experience units. These courses offered by departments and centers can be of one unit (42 hours of students time) or two units (84 hours of student time). Faculty offering these courses will award these units at the successful completion of the course requirements. If the course offered is of 2 units, faculty at the end of evaluation may award 2 units or only 1 unit if the work is partially satisfactory or none if the work is not satisfactory.

Many of the departments which offered design courses in the previous curriculum would like to retain and reoffer them in new form under this category with suitable modifications. Departments and centers are free to design and offer more than once course under this category. Any appropriate prerequisites necessary for enrolling in such courses need to be mentioned. It is also good opportunity for departments not offering UG programs and centers/schools to engage with UG students by offering new elective courses under this category.

A few of these courses which cut across departments and are multi-disciplinary in nature too can be offered under the umbrella of interdisciplinary groups (for examples robotics). One of the courses which needs to be offered under this category is Minor Design Project of 2 units. Minor Design Project will give students an opportunity to work in teams under the supervision of faculty on a real life project with design content. Some of the institute co-curricular activities pertaining to team based product building such as Robotics, Automobile, IGEM can be carried out under this project course. SURA projects related to design and practical experience too can be brought under this course.

2. Regular Courses with optional Design and Practical Experience Component (Maximum 2 Units)

Departments and faculty offering regular core and elective courses can offer optional design component in their courses at the time of registration. Successful completion of course will give credits to students and at the same time they will be eligible for earning (1 or 2) design units if they successfully complete optional design component. Faculty offering these courses will award these design units at the successful completion of assigned design work.

3. Summer Internships with Industry (2 Units)

Students can undertake minimum of 40 days of successful internship (to earn 2 practical experience units) during summer vacations. This would be administered in the same manner in which departments presently administer the internship course by appointing a faculty coordinator who would also be responsible for awarding these units.

4. One Semester Internship (5 Units)

In the new curriculum a provision has been made for students to opt for one semester internship in industry with minimum of 100 working days. This is the only activity upon successful completion of which students would be eligible for 5 units of design practical experience. It is mandatory that student's work during this internship is supervised by two mentors one from the institute and another from industry. Students desiring to opt for one semester internship are required to plan well in advance and submit a project proposal in consultation with supervisors. Students can proceed with the internship after committee constituted by the department approves the same. Partial or complete units can be awarded by the departmental committee after evaluation at the end of internship period.

5. One Time Design Practical Experience Module (1 Unit)

For both existing and visiting faculty as well working professionals from industry, NGO & Freelancers who would like to engage students in a workshop/course related to design and practical experience, this one time module can be offered as one unit course. This is one of those courses which will not appear in courses of study but can offered with approval from Dean/Chairman (Senate). This 40 hour modules can be typically offered during mid-semester breaks, winter/summer vacations and even during non-class hours during the

semester. Different ways in which above discussed methods of earning design/practical experience units are summarized in the following table.

Summary of Offering and Evaluation of Design Practical Experience Units

Design/Practical Experience	Design of Textile Products (TTDXXX) Design of medical Products (BMDXXX)	Course is offered by departments/centers. Student registers at the time of registration (Open to all departments/centers/schools)	Faculty offering course awards these units
	Robotics – Design of Medical Robotic Systems (ABDXXX)	Course is offered by interdisciplinary group on Robotics (Open to all multidisciplinary faculty groups across the institute)	Faculty offering course awards units
	Minor Design Project (MEDXXX) Minor Design Project (AMDXXX) Interdisciplinary Design Project (JLDXXX)	Minor Design Project courses are offered by Departments/Centers. Students register for this course preferably in teams under the supervision of faculty. (Open to all departments/centers/schools)	Departmental committee which evaluates these projects awards units. Institute level committee which evaluates these projects will award these units
	Energy Systems & Technologies (MELXXX) Soil Mechanics (CELXXX)	Faculty teaching these courses also decide to offer optional design component. Some of the students registered for this course also opt for design component (Open to all departments/centers/schools)	Faculty offering course awards units
	Practical Training (EEDXXX) Practical Training (CSDXXX)	Course is offered by departments having UG programmes. (Open to departments having UG programmes)	Departmental committee which evaluates these internships/practical training awards these units
	One semester Internships (EPDXXX) One semester internship (CEDXXX)	Course is offered by departments having UG programmes. (Open to departments having UG programmes)	Departmental committee which evaluates these internships/practical training awards these units
	Design of Android Applications (YZDXXX)	One time module is offered by a faculty or group of faculty with one of the faculty as coordinator. (Open to all faculty; Prior approval from	Faculty coordinator awards design units

		Dean is necessary)	
	Design of Radio Controlled Aircrafts (UVDXXX)	A visiting faculty together with IIT faculty as coordinator offers this one time module during mid-semester break (Open to all faculty; Prior approval from Dean is necessary)	Faculty coordinator awards design units

Administration and Evaluation of Design Units

- Every department offering UG programmes will appoint a faculty who would be coordinator for Design and Practical Experience Units. HOD and coordinator together will moderate these units awarded to students. The coordinator also has responsibility of ensuring that units earned by heterogeneous activities meet the requirements in terms of learning efforts and experience.
- Institute will appoint a faculty who would be the coordinator for Design and Practical Experience units earned under the umbrella of interdisciplinary work. Associate Dean (Curriculum) together with this coordinator will moderate these units awarded under interdisciplinary work as well as those offered by departments and centers not having UG programmes.
- Departmental coordinators, Coordinator for interdisciplinary units and Associate Dean (Curriculum) together will form an institute level committee to review and modify plan and policies for administering these units.