Shivalik

College of Engineering | College of Pharmacy
Institute of Professional Studies
DEHRADUN

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Academic Manual-2019

SHIVALIK
GROUP OF INSTITUTIONS

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Vision:
To become a centre of excellence in the field of engineering, management and applied sciences committed to impart quality education to empower each student to succeed in global competitive environment and achieve a remarkable career as well as imbibe cultural values.

Mission:
- Provide for synergetic coupling of engineering management and applied sciences.
- Provide for unifying and interdisciplinary aspect of education.
- Create awareness for social, historical, ethical and human values.
- Incubate entrepreneurship.
- Create an intellectual spirit and capability of critical judgment.
- Provide innovation, patent and research.

Objectives:
- To create an ambience while achieving excellence and sustain the same with autonomy and accountability.
- To help improve the standard of education and provide service to community and economy through effective networking with Industry.
- To anticipate technological needs and provide ways and means to cater to them.
- To prepare manpower working towards enhancement of the country's techno-economic strength through technology innovation and entrepreneurship.
- To provide leadership in curricula planning, laboratory development and examination systems.
- To train men and women who shall interact with the community at large and inculcate in them a spirit of scientific temper and Endeavour.
- To encourage self-learning and creativity.

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I) Departmental Faculty Board

The Departmental Faculty Board [DFB] comprises of the Chairman [HOD] and all faculty members of the department. The Faculty Board under the chairmanship of the Head of the department [HOD] is responsible for day to day working and overall growth and planning of the department. The faculty Board should meet at least once in a week to discuss and decide over the given issues:

1. Allocation of subjects to the faculty members in a semester keeping in view their interest. The department should see that the faculty members teach a subject at least three times consecutively and shall take one laboratory class and one tutorial class pertaining to the subject. Discuss on student's attendance and any action to be taken.
2. Discuss on students' performance and action to be taken.
3. Laboratory development and its upgradation.
4. Organize Seminars comprising teachers, students and invited speakers.
5. Continuing Education Program for faculty/technical staff.
6. Discuss on Library matters (Text book/Reference Books/Journals etc.).
7. Contribution in Internships of the students
8. Contributions in Placement of the Students
9. Students' Counseling
10. Infrastructural facilities for LTP
11. Establish linkage between the department and industries and integrate Industry Oriented Specializations modules.
12. UG projects: planning and implementation
13. Course appraisal feedback from students
14. Encourage faculty members to contribute for the effective delivery in Shivalik Training Academy

II) Mentor Mentee System

In any educational setup, particularly in technical institutions, it is necessary to have cordial and strong interaction among the teachers, students and their parents so as to ensure a healthy and congenial atmosphere for the growth of students in totality.

The following shall be observed to develop and sustain a good and close interaction between the teachers and students.

1. Each teacher should be an advisor/mentor of at least 30 students. He/She shall maintain a register with the details of the students (Name, Date of Birth, Family status, parent's profession, Father's Mobile Number, School and College Performance etc.)
2. Students and teachers should organize picnics at least once in a semester.
3. Sports competition between teachers and students may be organized once in a semester.
4. Students doing well should be encouraged by the Mentor and their good performance should also be duly recognized.
5. Students not doing well should be advised to follow strategies for improvement of their performance.
6. Teachers (Mentors) shall communicate with parents over the phone once in a week and shall enter the conversation on portal and Mentor Mentee Register for record.
7. Mentor shall regularly interact with all his/her Mentees.
8. All parents are the stake holders in college and morally also they are important. Students and parents must be handled very politely and tactfully irrespective of the educational background of the parents.
9. It is the responsibility of the Mentor to ensure that contact number and postal addresses of their mentees are updated and corrected.
10. Following information necessarily to be communicated to the parents at right time:
    - Weekly Attendance and Total Attendance.
    - Marks in First Sessional Exams
    - Marks in Second Sessional Exams
    - Pending Fee status.
    - Wishes to Happy New Year, Dipawali, Holi and other major festivals etc
    - Involvement in any indisciplinary activity.
    - Any prize won by their ward.
11. Mentors may also take help of college authorities for the counseling of their mentees if it may help the students in some way.

III) Attendance

Academic discipline is of paramount importance for the success of any student. Attendance is an indicator of academic discipline. Students should strive to maintain 100% attendance in all their classes. The faculty should keep a record of attendance of the students through an attendance register.

The attendance should be uploaded every day after the class is held on the portal.Names of students falling short of stipulated percentage of attendance shall be notified every week. Continued poor attendance of students shall be brought to the attention of HODs and the Dean, Director and also intimated to the parents through the Mentor.

The teachers should counsel the students who are irregular in the classes and follow it up with students-parents-faculty meetings. Students keeping poor attendance in spite of appropriate advice and counseling may be presented to the Dean/Director for further counseling/appropriate actions etc.

The HOD shall put the attendance of students on the Department notice board and portal once in a fortnight with red color highlighted for students having less than **75 percent.**

To monitor attendance the following guidelines may be observed:

1. A separate Notice Board shall be earmarked for notifying names of students falling short of 75% attendance every week.
2. Faculty shall emphasize in his/her class the importance of attendance linked to academic performance.
3. Faculty shall counsel such students to improve their attendance during the next week and shall monitor the same.
4. If by the end of the second week from the date of notification of the attendance of the student does not improve, Mentor shall telephonically contact the parents informing them about the poor attendance of their wards and invite them along with their wards for a meeting with his/her in the third week.
5. In the Teachers-student-parents meeting, the Faculty shall highlight the importance of good attendance (preferably leading to 100% attendance) and request the parents to advise their wards to improve attendance.
6. The students must be informed that their academic performance is directly linked to their attendance and that poor attendance may debar them from taking the Internal Examinations/University Examination and ultimately they may be asked to leave the College.

IV) Debarred Policy: As per the University/Board rules a student having less than 75% attendance will not be allowed to appear in Internal Examinations/University Examinations.

A Further relaxation of 10% in attendance requirements may be given by the HOD after consultation with the Departmental faculty board, in special cases such as serious medical problems or some other genuine reasons that were beyond the control of the students. This

relaxation is subject to the final approval of the HOD after verifying all the supporting documents and cannot be claimed as a right.

Students that will be debarred from the internal examinations will attend the compulsory make up classes during the internal exams to cover their attendance. And their makeup internal examination will be conducted again once their attendance is improved. Such exams will be conducted during the preparation leaves etc therefore students are strongly advised to be regular in the classes and to avoid the debarred from the examination due to short of attendance.

As a special case considering career prospects of the final semester students, some more appropriate relaxation and flexibility in attendance requirement of final semester students may be given by the HOD if a student wants to devote more time for projects, skill upgradations, participation in interviews, internships etc. But prior approval of HOD is must and it cannot be claimed as a right.

V) Internal Examinations: Ist Sessional exams will be conducted after completion of first 50% of the syllabus and 2nd Sessional will be conducted after completion of last 50% of the syllabus. Question papers of both the sessional examinations will be strictly as per the University Pattern. It will be compulsory for the students to appear and pass in both the examinations, failing which he/she will be required to appear again in the respective internal examination. Performance in these examinations will be discussed in-person with the students and parents for further improvements.
For First year students a record of their performance in 12th class will also be compared with the sessional examination results and in case performance is decreasing students will be required to appear again in the internal examination.

Students that will absent from any paper of internal examination will be awarded **zero** in that subject in respective sessional and he/she will not be provided any additional chance. Thus his/her absence will consequently affect their final sessional marks sent to the University.

VI) Test Based Assignments (TBAs): Unit wise assignments will be given by the faculty members after completion of the respective unit. All Assignments must be of standard quality and necessarily include previous years University paper questions. Necessary and innovative strategies will be implemented by the faculty members to ensure no plagiarism in the assignments; which implies students must be encouraged to do their assignments on their own instead of just copying from others.

VII) Tips for Improvement of Student's Attendance (For Faculty Members)

1. Teacher should know the level of students. The past academic record should be noted from college database.
2. Prepare the lectures well (sufficient time should be spent for the preparation of each 1 hour lecture). While starting the academic semester, please see that your first 5-6 lectures are most impressive so that the students get attracted to your lectures and carried away to attend your lectures regularly (it always pays to deliver the first few lectures on the topics where you are the best).
3. Make the lecture understandable and interesting. Develop the lecture material on the black board as far as possible, instead of writing on the board from your notes.
4. Clarification of concepts and fundamentals and providing critical analysis, interpretation and application need to be emphasized.
5. Interact with students frequently.
6. Encourage students to your office for clearing their doubts
7. Meet the students not attending your classes and find out why they do not attend your classes & introspect yourself.
8. Motivate students to work hard by setting yourself as an example.
9. Interact with the students by visiting their hostel and inviting them to your home.
10. Motivate students towards self-study. Advise students to make habit of writing and delivering lectures.
11. You are encouraged to use Audio-Visual Teaching Learning Aids to make classroom teaching more interesting and interactive.
12. Adequate use of Charts, Cut Sections, and animated labs while explaining the principle/working of a device.
13. Small numerical make the teaching and learning both interesting.

VIII) Tips for enhancement of student's performance

Student's performance is greatly enhanced if the following points are observed:

1. 100% attendance in Lectures
2. 100% attendance in Tutorials
3. 100% attendance in Laboratories
4. Self-study with dedication (at least 1 hour should be spent for each 1 hour lecture attended).
5. Solve as many numerical problems as possible.
6. Make a habit of writing
7. Have frequent group discussions
8. Effective Class Committee Meetings. Students should discuss the conduct of all the courses comprehensively and depth of course, clarity and presentation of fundamental concepts, blackboard legibility, conduct of tests etc.)
9. Good and dedicated teaching.
10. Use of quality textbooks, reference books and lecture notes.
11. Extra lectures and tutorials to be taken for revision/discussion.
12. Continuous evaluation of students through class tests/surprise tests/viva.

13. Regularly providing question banks to the students (before 1st Test, 2nd Test and Pre-university Test) and discussing them comprehensively.
14. Tutorials must be made more effective with more dedicated involvement of faculty and the students After the first week of teaching, one assignment (one page of writing) should be given to the student each week. Best assignment should be uploaded on the portal for the benefit of students.

IX) Teaching Learning Process

Important Instructions to all faculty members (Existing and Incumbents)

All the faculty members are required to read this document carefully. The academic manual is a collection of academics and academic-administration process & procedures. The document will act as an orientation document for new faculty members.

Contents:

1. Teaching Learning Process
2. Quality Assessment of Course Material
3. Feedbacks

The Teaching Learning (TL) Process

The Whole Teaching Learning Process has three sub-processes

1. Planning and Execution
2. Monitoring and Control
3. Procedure of Uploading Course Material on Intranet (ERP/Dedicated Server)

Planning and Execution

The Teaching Learning process begins the moment a course has been allotted to a Faculty. HOD should allocate subject usually 7 days before the start of the new semester so as to enable the Faculty to design the course well.

Help from NPTEL, MITOCW and other sources from different universities should be used to clear the concepts before commencing the course.

Step1: Designing the course

Once a course is designed, a document called the Course Description is produced. The Course Description consists of:

1. Title, TLP structure, Course pre-requisites
2. Objective: The objective is to be spelt out at the inception such that the students understand that they would learn the process in designing, building, testing etc. with the selection of appropriate technology.
3. Learning Outcomes: The Learning outcome of the course is what the student should know in order to meet course objective. It identifies broadly the topics, the techniques, the tools on which the student should have knowledge, understanding and awareness.
4. **Topic Layout**: This spells out the number of lectures, tutorials and practical sessions to be devoted to each topic in the course. Care is taken not to waste any contact hour.

5. **Lesson Plan**: The lesson plan is built on a weekly basis for the whole semester. It identifies the lecture contents to be covered in the week, the tutorial work to be carried out and the practical work that would be based on the material that has been covered in the previous week. The lesson plan thus identifies the flow of work and strengthens lecture material by appropriate problem solving sessions.
6. **Methodology:** This identifies the nature of interaction between the teacher and the student, whether formal, case based and so on. Additionally, the expectations from students are spelt out here so that there shall be a project, self-learningexercises; term papers etc. could be prepared accordingly.
7. **Evaluation**: the instruments of evaluation are articulated here. These may be quizzes, open book tests, closed book choice-less test etc. The break-up of marks is also given here.
8. **Books and reference Material**: This is a list of material relevant to the course and available in the SCE Library.

Step 2: Review the Design

Course design (**at present for Industry oriented courses and Shivalik Training Academy courses**) is to be done, preferably in a meeting of the full department; Where this is not possible, the HOD may select experts in the area or related areas of the course.

The Course Instructor shall make the meeting walk through the course and specially see that it is well designed. The objectives should be well formulated, the lesson plan should make optimal use of time, tutorial and laboratory work should be well organized, the methodology gives room for enough interaction in the classroom and recommended books and literature is adequate. The Course Instructor makes change in the design as appropriate to produce a final course description.

Step 3: Order Material for the Library

The titles, author, publisher etc. must be made available as soon as the course description is finalized.

Step 4: Ensure availability of Laboratory, equipment and other facilities

All laboratory facilities needed must be finalized. This is to be passed on to the Timetable Committee.

Step 5: Prepare Course Material

Course material is to be prepared keeping in mind the lesson plan, the learning outcomes and the course objectives. No material other than that which reaches the outcome and meets the objectives is to be included.Help from NPTEL, MITOCW and other sources from different universities should be used to clear the concepts before commencing the course.All materials should be prepared to emphasize the capability to design. It has to be particularly ensured that at least one problem per lecture is solved by the class in an interactive mode with the Faculty as facilitator. Since the attention span of any audience is about 15 minutes, an interactive session, perhaps an exercise should be planned for 5-10 minutes after every 15 minutes. In preparing course material, Faculty shall use state of the art teaching tools and techniques.

Step 6: Build a Course File

The Course File consists of the course description; the weekly course material (lectures slides, tutorial, exercise, laboratory work of every week, home assignment, projects, and quizzes or other evaluation instruments). Question papers of examinations are added to the Course file after examination is over.

Description of Course File

The course file shall be developed as per the following attributes:

1. Title of the Course, Subject Code
2. Course structure and brief outline of the course contents.
3. Allocating of number of lectures to specific topics-course Description (TLP-1).
4. Good standard textbooks, reference books and other literature should be used. (List is to be maintained in the file).
5. Complete lecture-wise notes duly numbered as lecture number 1, lecture number 2 etc.
6. Assignments with their solutions.
7. Tutorial sheets provided to the students with their solutions.
8. Before each sessional exam, the teacher is supposed to discuss, in general, these questions banks and give appropriate guidance and direction to the students.
9. One or two short surprise tests in the class with their details maintained in the Course File.
10. Course Evaluation form is to be circulated to obtain student's feedback in enhancing quality of teaching.

In Brief Course File shall contain

I. Course Description (TLP-1)
II. Lesson Plan.
III. Course Progress Report (TLP-2)
IV. Syllabus
V. Lecture Notes
VI. Tutorial Sheets and their solutions
VII. Tutorial progress report (TLP-3)
VIII. Assignments and their solutions
IX. Question Bank
X. Previous year's Question Papers
XI. Course Evaluation Form (CEF-01)
XII. Any other material that supports quality teaching

Step 7: Deliver the course

Some guidelines for conducting Classes (Do's and Don'ts)

a) Learning is a cycle consisting of three steps, formulating a learning goal, raising questions, and answering the questions by finding knowledge sources. The TL process must clearly spell out the learning goal of each class and formulate appropriate questions. The teacher is, of course, a great source of knowledge but student-student interaction also goes a long way in facilitating learning. Sufficient time must be set aside for other student's to comment, for example by encouraging small debates on points requiring clarification, calling for the class to discuss peer student's point of view, commenting on student's solutions to exercises etc.

b) When a student actively participates in the TL Process, then and only then does true learning happen. It is for the students to learn and put in the effort to learn. Indeed, whether the students work individually, with the teacher, or in groups, it is essential to make the student active. This is where the approach of `Learning by doing' is so effective. A student tries to do, fail to do and then learns to do. While trying, the student is active. When failure occurs then the worst situation arises as inactivity sets in. This is where (a) above helps by leading to an atmosphere of learning being created and (b) encourages finding knowledge sources.

c) The attention span of any audience is about 15 minutes. The student becomes passive and goes into mental hibernation. It is necessary to bring the student back to class. This can be done by setting a small question or exercise, related to the material covered in the last 15 minutes. Students immediately wake up to `do' the task. This gives the student an insight into other possible solutions, how to evaluate solutions correctly, and also make the teacher aware of the extent of the learning that has occurred.

d) To increase student-teacher interaction, we use electronic media. Complete lecture-wise notes, Assignments and Tutorial sheets are prepared at the start of semester by Faculty. The HOD or his/her representative (Sr. Professor) shall review the quality of lecture notes, assignments and tutorials. Collection of above mentioned items are to be kept in course file.

e) Please make sure that classes, tutorials and laboratories are notleft unattended. Please make sure yourself for timely delivery of the lecture, tutorial and labs. Don't leave the class early.

f) Each Faculty has to upload the Lesson Plan, Question Bank, Assignment and Tutorial Schedule and Power Point Presentation on internet at his/her domain name. Faculty must ensure that solution of tutorials should be uploaded after its commencement in the class. Similarly, all dates of issuing of assignment, submission date and examination dates are to be uploaded on ERP for records.

g) Mark the attendance in attendance register and fill absentee's daily record and submit it at designated place (HOD/Dean/Director's office) daily. Please note that college has adopted a computerized attendance system. If a faculty fails to submit duly filled sheet (Correctly filled all entries) it will be treated as an act of indiscipline.

Guidelines to conduct Tutorial and Assignment:

I. The faculty prepares a Tutorial and Assignment Plan in Course Description. The assignments and tutorial sheets should be available in the Course File and on the intranet (as and when needed, not prior to assigning them).

II. The nature of tutorial and assignment should be application oriented. Tutorial and assignment can be conducted as a group activity. Tutorials are specially designed in such a way so that topic covered in the lecture may be practiced as its application. It is essential that all or important topics are addressed properly in Tutorial Application Form.

III. The faculty conducts tutorial classes for 30 students in a batch as per plan and updates TLP-3.

Guidelines for conducting tutorial classes are as follows:

1. **Tutorial sheet of the week is given in advance. Students are asked to do the same. On the day of tutorial class (tutorial class shall be small so that a faculty can conduct the tutorial class more effectively and efficiently) the faculty shall clarify the doubts, concepts and fundamentals to the students. Students shall be encouraged to ask their doubts and difficulties and the faculty shall clarify them in a very effective, friendly and positive manner with examples wherever possible.**

2. The faculty shall handle the tutorial in such a manner that students like to attend the tutorial to learn the subject in depth.

3. The faculty shall solve in the class few typical numerical problems highlighting the concept, approach and methodology of solving a problem most effectively.

4. *Groups must be formed in the class and there should be interaction between students in a group while solving problems. The faculty can share his/her time in explaining difficulties to the students on group basis.*

5. The faculty finds out the problems from each group that could not be solved by them and then solves the problem(s) common to all groups. Other problems, which have been solved by one or the other group, are then discussed through the groups for the benefit of the entire class. Every student shall submit the tutorial assignment regularly.

6. The faculty shall give well thought-out tutorial sheets to the students and make them solve as many problems as possible.

7. Periodically, surprise and short tests shall be conducted in the tutorial class to keep them solve as many problems as possible.

8. HOD must ensure that the quality & conduction of tutorial and assignment is as per plan. He may interact with students through Class Committee and advice the faculty accordingly. He has to submit a confidential report to the Dean Academics.

Guidelines for Laboratory Development:

1. The Lab faculty in-charge identifies and develops suitable experiments in the laboratory in an efficient and effective manner to justify the theory taught in the class. Experiments developed can be demonstration, regular, open-ended or project based.

2. A laboratory manual is developed by the lab faculty in-charge, which contains well-formulated instruction sheets for all the experiments to be performed.

3. The lab faculty in-charge in consultation with teaching faculty develops appropriate detailed instruction sheets to be used by the students in the laboratory. The instruction sheets for an experiment would contain the following:

   a. Title of the experiment
   b. Objective
   c. Brief theory
   d. Apparatus required
   e. Procedure
   f. Circuit diagrams
   g. Experimental data
   h. Calculation based on experimental data done by the instructor before hand
   i. Analysis, discussion and Precautions
   j. Post experimental quizzes (Wherever necessary)

4. All students must get a copy of laboratory manual as a guide to conduct the experiments.These lab manuals should be uploaded on the intranet.

5. In order to conduct the laboratory classes effectively and efficiently, lab faculty in-charge shall take care of the following;
   a) List of experiments are displayed in the laboratory
   b) Formation of groups of the students for laboratory classes
   c) Cycle showing group-wise conduction of the experiments. The group coming for a laboratory class shall be divided in to some group consisting of two to three students. In a semester two cycles of experiments shall be conducted.

      Each cycle shall consist of 5 to 6 experiments so that these experiments are conducted simultaneously by 5 to 6 sub-groups of students when laboratory class is on.

6. Student's attendance in the laboratory classes is monitored & maintained by the concerned faculty. Students not attending practical period for 2 consecutive turns are to be notified to HOD.
7. Faculty would check the student's preparedness to conduct the experiments (students shall come prepared for the laboratory classes).
8. Faculty would guide and interact with the students while performing the experiments and clarify their related queries.
9. One student from each group would submit a group report on the experiment performed after a week i.e. in the next laboratory class. Each student in a group shall take a leading role in writing the group report in-turn.

10. *While in the beginning year, the student may go through conducting the routine experiments at third and fourth year levels they must be encouraged to perform some open-ended/project type experiments so as to use their inherent potential and inquisitiveness in doing things independently and to acquire the self confidence that is vital for a professional career. It shall be the endeavor of the faculty to improve the overall conduct of the experiments and modernize the laboratory in a sustained manner. The laboratory manual needs appropriate updating periodically.*
11. Laboratory equipment maintenance: The system for lab equipment maintenance is explained in procedure by respective HODs.

Procedure for Uploading Course Material on Intranet

The faculty members are required to upload all teaching-learning material on intranet in approximate area designated for this purpose (Please contact HOD for details of these areas). Teaching-learning material includes all transparencies or PPT or computer based techniques, tutorial worksheets, laboratory worksheets, assignments & projects. Normally this uploading should be done at least one week before the material is taken up and latest by one week after the material is taught.

Quality Assessment of Course Material

Quality Assessment of course material is important,as SCEbelieves in quality management. Assessment of course material will be done by Sr. Professors. This assessment is meant purely for quality improvements and better teaching. All teachers are expected to maintain the Course File andget teaching material ready before the 1st Sessional Examination of the Semester. Dean Academic with HoD will announce the schedule of reviewing the course material before Ist Sessional Examination.

X) STUDENT FEEDBACK EXERCISE

Student's feedback on teaching is an important element in the process of quality assurance of education which is usually conducted through 'online process, two weeks before the end of semester. The purpose of this feedback exercise is to gather information on student's learning experience. The information provided will be useful to teachers as well as the college in enhancing the quality of education at SCE. The data provided will be treated as confidential and released to the relevant teacher AFTER examination results published by the University. The College strongly encourages all those students who have attendance more than **75%** to take part in the exercise.

XI) SELF LEARNING

With a proper planning of the curriculum and its implementation, it is possible to impart excellent training. One important aspect of the implementation is to encourage self-learning so that the students may develop confidence in solving real life problems. The learning initiatives of the students are as important as the class room teaching through lectures and tutorials/practicals.

Regular assignments of carefully structured problems and interaction through equally regular evaluation serve complementary functions in bringing out the best in the student. Assignments can be of two types:

- Common for the whole class and

- Carefully chosen individual ones, which should preferably be open-ended, based on the student achievement in type(a).
- Information retrieval is an essential part of training in engineering. This can be achieved through seminars based on stipulated hours of library work.

U.G. PROJECT

For the partial fulfillment of B. Tech U G Project is to be submitted with complete report to the respective department in Final year of U. G. Course.

Following steps are followed:

Step I- At the start of VII semester Students are asked to submit their detailed innovative research proposal (U. G. Project) within 15 days to the Departmental Project Coordinator.

Step II- All research proposals are presented (PPT) by the students in front of Departmental Project committee.

Step III- After approval of research proposal by the Departmental Project committee the complete project is divided into two parts:

- Minor Project (VII Semester)
- Major project (VIII Semester)

Step IV- The progress of Project (Minor + Major) is recorded by Project Coordinator as follows:

PROGRESS REPORT

STUDENTS	**SUPERVISOR**	**PROJECT COORDINATOR**	**HOD**

	EXPECTED OUTCOME	**EXPECTED TIME (IN DAYS)**	**TIME TAKEN (IN DAYS)**	**STATUS (SIGN IF DONE)**
Project definition and planning				
1. Form team	Names of students and completed forms	5		
2. Develop tasks	Complete project broken down into activities. Type written on A4 sheets.	5		

3. Research a. Internet research b. Library	Presentation. One slide per reference. Conclusion drawn from each reference. Images of *existing* products can also be included.	13		
4. Estimate schedule and cost	Gantt Chart (of above activities) and rough cost estimate after talking to vendors. Computer generated on A4 sheets.	3		
PROJECT PLAN APPROVAL				
Specification definition				
5. Identify end users	List of potential end users. Type written on A4 sheets.	2		
6. Generate engineering specifications	Specifications type written on A4 sheets.	2		
7. Generate engineering specifications	Specifications type written on A4 sheets.	3		
8. Set targets	Set performance targets for achieving desired quality.	3		
SPECIFICATION APPROVAL				
Conceptual design				
9. Generate concepts	Five rough pencil sketches on A4 sheets	5		
10. Evaluate concepts	Pencil sketch of finalized concept on A4 sheet(s)	2		
11. Make concept decisions	Make annotations or comments on above finalized concept	3		
12. Document and Communicate a. Select journal b. Select title (tentative) c. Prepare abstract d. Rest of the paper Contents to be discussed with supervisors	Type written on A4 size sheets a. Details of journal. Journal should have ISSN number or do I number or SCI index or should be peer reviewed referred journal. b. Author instructions and template of paper (if available) c. Title, author affiliations (student names in alphabetical) Order and supervisor name in the end) and abstract. d. Other contents of paper to be written	3		

	as per supervisor guidance.			
13. Refine Plan	Make refined pencil sketch with annotations	3		
Product development				
14. Document and communicate a. Bill of Material (BOM) b. Drawings	BOM should be on A4 sheets in prescribed format. Drawings can be manual or computer generated on A3 or A4 size sheets. Limit number of drawing sheets to total of three.	13		
	START PROTOTYPING AFTER APPROVAL			
Define Activities				
1.				
2.				
3.				
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9.				
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11.				
12.				

XII) INDUSTRY-ACADEMY LINKAGE

Great importance shall be given to close interaction of academic institution/college with industry. Senior personnel from Industry may be grouped in as expert members in several academic programs. The college will interact with Industry to provide real life exposure of the industrial world to the students through well planned vacation training programs. The college shall also endeavor to have a program for industrial visit of faculty to industries with a built in provision of incentives as well as provision for the appointment of adjunct faculty from the industry.

Interaction with experts from industry shall be of great importance while pursuing the undergraduate projects. The industry may also provide financial inputs for some projects in the under graduate projects which shall greatly help in the placement of students in relevant industries. The college should seek a close collaboration with industries as human resources available in the college can provide consultancy to many of the industrial problems. The College not only generates resources through industrial consultancy but also the faculty gets the satisfaction with their involvement in real life problems. *It is also advisable to periodically invite experts from industries to give seminars for the benefit of students and faculty and make them involved in the academic programs of the college to the feasible extent.*

INDUSTRY-OREIENTED COURSES

Industry oriented education is an approach to learning from an industry perspective. With traditional technical methodologies in educational environments, the conventional pathway is to build the foundation learning through subject based teaching of science and engineering independently. Subjects based on the knowledge required for the discipline usually follow on from this. The problem with this traditional methodology of learning is that there is no close relationship with industry requirements.

Two industry oriented courses should bedesigned in every department to meet the requirement of the industry as well asto cater the need of the Industry. The curriculum of these courses should be designed keeping in view the latest trends of the Industry.

XIII) FACULTY DEVELOPMENT

Induction of high quality faculty in technical institutions is essential to sustain and enhance excellence of technical education. The following are essential for high quality faculty development.

- Recruit potentially bright and qualified faculty.
- Faculty should keep pace with the cutting-edge technology
- Faculty should be encouraged to publish papers in good journals and participate in National and International Conferences
- Management should have a plan to send if necessary 10 to 15% of their faculty for higher studies to reputed institutions periodically so that all faculties should ultimately have a Ph.D. degree
- Post-doctoral experience should be encouraged
- Capsule courses by reputed faculty in weak areas must be arranged
- Seminars by distinguished experts from Industry and Academia must be arranged periodically
- Each faculty must deliver a seminar at least once in each semester in his area of specialization
- Improved utilization of institutional resources
- Designing and developing learning resources
- Up gradation of competence in knowledge and skills in specified area(s) for better teaching at UG/PG levels.
- Undertaking research for creation of new knowledge and new technologies and undertaking consultancy projects for industry and community.
- Peer review and feedback from students
- Procurement of learning resources such as video films, multimedia and CAI packages
- Building up infrastructure and resources for research
- Incentives to teachers for participating in continuing education programmes, consulting services, services to community and economy
- Establish a system to recognize merit and outstanding performance of teacher
- Offer service package that would attract and retain good quality teachers.

External Courses Workshops

Often courses are organized by other Institutions. These courses are used to address specific faculty up gradation needs depending on the interests of a faculty member and relevance to SCE. Faculty members are permitted to attend such courses. Faculty members request for participation in such course and obtain due approval, both for leave of absence and funding. Normally, a faculty member shall participate in one course every year. However, where course participation is essential, this may be relaxed.

The highest priority is given to cutting edge knowledge courses from premier institutions and other reputed international societies and industrial houses. Such courses go beyond the normal teaching subjects at Bachelors and Masters Levels and instead deal with new emerging subjects. Normally highest priority shall be given to only those courses that are delivered by internationally reputed Departments, Institutions or Technical societies. Second priority shall be given to core courses at the Doctoral and Masters that faculty members might want to pick up. These may be related to their area of specializations necessary for research or form part of state-of-the-art status.

Third Priority shall be given to courses under the aegis of AICTE, UGC, and DST etc. and conducted by secondary/tertiary Institutions provided they have a proven track record of expertise in the area of the course.

The lowest priority shall be given to product awareness course. Normally, faculty members are expected to pick this upon their own initiative. However, where the product represents a paradigm shift or is to be adopted in the curriculum, faculty members shall be encouraged to attend such courses.

Funding

Normally, forthe conferences held in India

If the faculty member has to present a paper that shall appearing the Conferences Proceedings then travel as well as registration fee shall be given.

For, conferences held outside India, registration fee shall be provided by SCE (After service period of minimum three years). The balance may be obtained from bodies like UTU, AICTE, DST and other funding bodies.

Industrial Attachments and Sabbaticals

Industrial attachments are aimed at exposing faculty members to work practices and problems. Post attachment, when faculty members return, it is expected that this experience shall make teaching and research more relevant to industrial needs.

Similarly sabbaticals are periods when faculty members go to a different academic environment to expose themselves to different ideas including teaching, research, academics, policies and structures etc. over a relatively longer period of time.

Industrial attachments and Sabbaticals may be for periods of up to one year at a time and may be availed of once at the end of every five years of service. Sabbaticals and attachments are not cumulative in nature. However, where a faculty member has been denied these due to exigencies of work, such attachments and Sabbaths may be treated as cumulative.

Financial Incentive
During attachment/sabbaticals, faculty members may obtain remuneration from the organization they join. Additionally, upon joining back in SCE, the faculty member shall be entitled to receive from SCE Basic + DA for two semesters. The seniority of the faculty member within SCE shall be maintained.

Attaining Higher Qualifications
SCE encourages its faculty members to attain higher academic degree in relevant field of specialization. Flexibility in adjusting normal faculty workloads is to be provided, for example, the time table may be arranged to give a day off per week. Additionally, faculty may be allowed to leave SCE Campus to do course work, meet their supervisor, consult library etc. Normally, no reduction in work load shall be made.

Funding
The faculty member concerned is expected to meet all expenses including fees.