# B.Tech / M.Tech (Integrated) Regulations 2021 – Guidelines

## Summer Semester

(i) There may be one short Summer Semester during the summer vacation, i.e., (May - June). Only a few courses may be offered during Summer Semester for the benefit of students:
   a. To clear their failed/dropped courses.
   b. Who got transferred from other institutions.
   c. Pursuing Minor certification.
   d. Under Study Abroad Programme and
   e. Who got detained.
(ii) Summer semester courses will be offered based on the following:
   a) Summer semester courses may be announced after the final detention list of even semester is released, by the respective Schools/Departments, with the approval of the Dean (CET).
   b) Student has to register for the summer semester courses and pay the prescribed fee of Rs.10,000 within the specified time limit.
   c) Students withdrawal from summer semester courses is not permitted.
   d) These courses will be conducted for 7 to 8 weeks during summer vacation
   e) A student has to secure a minimum of 75% attendance in each ~~of these~~ course.
   f) All assessments as specified in the syllabus for that course have to be undertaken by the students.
(iii) Further, the Choice of offering the courses and the number of courses to be offered during summer semester is at the sole discretion of the department or school depending on the enrolment and availability of resources, with approval of Dean (CET).

# Internships

(i) With the prior approval,Students can undergo Semester Internships either in an Industry or in a Research Centre or Specialised laboratories in a higher educational institution for a duration of 12 to 15 weeks during the Eighth semester / Tenth semester as applicable, duly approved by the department Project Review Committee / Panel.
(ii) All internship offers either through placement cell or other sources must be recommended by directorate of Career Centre
(iii) There must be a Faculty mentor from the department concerned and an external mentor from the industry or research lab or in HEIs, where he/she is undergoing ~~doing~~ the internship. The external mentor must be at the level of an Engineer or a Technical manager and above.
(iv) Every internship student must be monitored through periodical reviews (max. 3) by the Project Review Committee / Panel.
(v) A confidential assessment report from the external mentor as per the prescribed format must be sent to the internal mentor before the final viva voce, in addition to the internship completion certificate mentioning the period of internship.
(vi) There is no detention for this course.
(vii) At the end of the Semester Internship, the student shall submit a report and undergo the due process of assessment by internal examiners through presentation and viva voce examination, for successful completion of the internship.

(viii)   After the due evaluation, if the examiners assessed–that the knowledge gained through internship is not adequate, then the period of internship will be extended by a month. During this extended period, the student is expected to get the required knowledge and attend another viva voce before the panel and complete it successfully.

# Practicum

**Joint Course – Weightage for Practice portion is 15%**

(i)    The required theoretical topics must be covered during the lecture hours.
(ii)   During practical hours, practice can be given to the students on selected application-oriented topics of the syllabus.
(iii)  The practice portion must be done in the classroom itself. Separate lab venue is not required.
(iv)   Practice must be provided using software/activity kits/instruments/models and any such methodologies.
(v)    Outcome/ result/report of the practice portion must be evaluated for every session in the classroom which will carry 15% of continuous assessment (CLA-II).
(vi)   No report needs to be submitted at the end of the semester. (rough working documents can be retained as  a proof for portfolio)
(vii)  There is no end semester exam for this practice portion.
(viii) The detailed marks weightage/split-up can be referred to the Syllabus.

**Project Based Theory Courses – Weightage for Project portion is 60%**

(i)    PBL requires critical thinking, problem solving, collaboration, and various forms of communication. To answer a driving question and create high-quality work, students need to do much more than remember / recollect information. They need to use higher-order thinking skills and learn to work as a team.
(ii)   The Project must be submitted at the end of the semester.
(iii)  The project may be a demo on a concept/theory related to this course using a simple kit/development of software.
(iv)   Students may do the project with a team of size not more than three.
(v)    No extra contact hours and no venue will be given for the project.
(vi)   Students need to prepare a report and submit at the end of the semester and the report must contain Abstract, Introduction, Objectives, Description, Tools used and Conclusion
(vii)      Student teams have to give a brief presentation during the evaluation of the project.
(viii)     The respective course faculty may assess and evaluate the project within the class hours. No external examiners will be appointed.
(ix)   There is no end semester examination for project portion.
(x)    Marks awarded for the project portion may be considered as a part of (60%) continuous assessment (CLA-II).
(xi)   The end product can be a brochure, poster, or webpage presenting the design, a PowerPoint presentation about the project/showing the proofs or an oral presentation of one of the proofs.
(xii)  The detailed marks weightage/split-up can be referred to the Syllabus.

**Practical /Lab course**

(i) It is a practical course related to the theory course that has been registered in the same semester or previous semesters.

(ii) The List of experiments will be prepared to enhance the higher order thinking skills and also must be within the list, as recommended in the syllabus.

(iii) Students have to complete the list of experiments and submit a report.

(iv) Separate lab venue can be allotted for this course.

(v) The end semester examination is to be conducted by the respective department / School and will be conducted at the last week of regular working days.

(vi) 40% weightage is given for end semester examination.

(vii) The detailed marks weightage/split-up can be referred to the Syllabus.


## Community Connect

(i) A student is expected to engage himself/herself with the community for a period of 4 to 5 weeks during the summer semester vacation after the 4th semester either as an individual or a group. The engagement shall be in any of the following ways or equivalent as approved by the department / school during the 4th semester :

- Teaching school children on the technology / relevant field of specialization.
- Engage with government approved NGOs in their activities.
- Village panchayat in development / restoration activities.
- Women empowerment in the form of upskilling / improving their literacy rate etc.
- Physically challenged in the form of Helping / upskilling / technology update etc.
- Any Government / private Hospitals or recognised rehabilitation centres or old age homes or orphanages etc.

(ii) At the end of the training/community connect, the student shall submit a report to the department and make a presentation during the 5th semester, which will be assessed by a committee constituted by the department or school for the credit. The student / group shall provide necessary proofs along with a report / document to the department. The document may contain the details of the work undertaken presented in the form Introduction, type of activity with Geotagged photographs, analysis of social welfare measures and outcomes, suggestions provided etc.

(iii) There is no end semester examination for the Community connect.

(iv) Attendance may be given based on the production of attendance certificate / completion certificate from the organization where he/she completed this work during evaluation.

(v) There is no multiple entry of attendance in academia/ERP and continuous assessment for this course.

(vi) Students those who failed to complete this course in 5th semester may complete at any time after 5th semester and will be treated as arrear.

(vii) There is no detention for this course.


## Professional Electives and Open Electives:

Professional Electives and Open Electives allow students to design their own course plan that suits their career goals. Professional electives are courses that progresses a student's

professional development by allowing them to develop a deeper understanding of a specific subject area within the degree discipline. Open Electives concept allows a student to familiarise himself/herself with basic concepts of a stream of study outside of his / her major field of engineering domain.

**Professional Electives: ( Verticals)**

These types of courses are categorised as Verticals that will be Industry specific or Industry Sector specific or Specialisation Specific Electives.

- *Industry Specific* electives are designed by industry experts identified through the official Memorandum of Understanding (MoUs) executed already in the department or school. The course will be taught by industrial experts (within or outside of India), participated and ably assisted by internal faculty members for the attendance, evaluations and assessments. All assessments will be conducted as per the syllabus. For instance, *Virtusa company* offering a course on "Cloud Computing", *Design Intellect* company offering a course on "Design Thinking". The industry experts will be paid an honorarium as per the university norms. The courses can be delivered in a physical or online or blended mode.

- *Industry Sector* specific electives are focussed on a particular domain in the industry sector. For instance, Decision Sciences/ Data Science vertical with list of courses in the same domain. These electives are designed by the department/ school with expertise from industry personnel. These courses are taught by internal faculty members after sufficient mandatory up-skilling to the faculty members through various forums such as:
    - Faculty Development Programmes / Workshops / corporate training with a minimum of 6 days /approved Faculty Industry Immersion Programme (FIIP) with a minimum period of 15 days in compliance with the FIIP policy of the university.

                                      AND
    - online courses certifications in the respective domain.

        All assessments will be conducted as per the syllabus. The courses can be delivered in a physical or online or blended mode.

- *Specialization Specific Electives* are focussed on the particular specialization, ex. AI and ML will have list of elective courses relating to that specialization like *"Machine Learning, Deep Learning, Industry 4.0, Electric Vehicles, Autonomous Vehicles, Biosensors, etc".* These electives are designed by the department/ school with expertise from other leading institutes/and industries.  These electives are designed by the department/ school with expertise from industry personnel. These courses are taught by internal faculty members after sufficient mandatory up-skilling to the faculty members through various forums such as:
    - Faculty Development Programmes / Workshops / corporate training with a minimum of 6 days /approved Faculty Industry Immersion Programme (FIIP) with a minimum period of 15 days in compliance with the FIIP policy of the university.

                                      AND
    - online courses certifications in the respective domain.

All assessments will be conducted as per the syllabus. The courses can be delivered in a physical or online or blended mode.

**Open electives**.

The Open elective courses are categorised as

(i) *Horizontals*:- Electives taken across the departments within the respective college/Faculty. (Open Elective) (6 credits)
(ii) *Cross-Faculty Electives*—Electives taken across the Colleges/Faculty.(Open Elective) (3 Credits)
(iii) All the Horizontal and Cross Faculty Electives must not be studied both in the past and future semesters.
(iv) The courses must be designed in such a way that there must not be any requirement of prerequisite and must be generic/holistic/societal in nature so that it can suit every kind of learners.

> Horizontal Open Electives are list of courses specified by departments / schools, of College of Engineering and Technology (CET) under open elective category. A student belonging to a department shall take courses listed under open elective by other departments. For Ex. Student of CSE shall choose open electives listed under ECE department. These electives are designed by the respective department / school. All assessments will be conducted as per the syllabus. The courses can be delivered in a physical or online or blended mode.

> Cross-Faculty Open Electives are list of courses specified by departments / school across the faculty / college under open elective category. A student belonging to a department shall take courses listed under open elective by other faculty / college.  For Ex. Student of CSE under CET shall choose open electives listed under Faculty of Law / Faculty of Management studies.  These electives are designed by the respective department / school. All assessments will be conducted as per the syllabus. The courses can be delivered in a physical or blended mode.

- Instead of Professional Electives / Open Electives, students will have a choice of choosing maximum of 4 MOOC courses with certification (8 weeks or 12 weeks) from approved platforms like NPTEL/Coursera to acquire those credits starting from 4th semester. The list of MOOC courses that a student can take MUST be approved by the concerned department. The credits will be transferred based on the submission of certificates earned.

# Guided study / Self Learning

Students who maintain CGPA 9.5 and above will have the flexibility of self-learning an existing approved Professional elective course with prior permission from department starting from Semester- VI.  The maximum number of such courses that a student will be permitted by the

Department will be **TWO for** the entire programme. *This will be guided and assessed by a faculty member, and students will have to undertake all assessments as prescribed in the syllabus and must appear for physical mode of end semester examinations.* This will be counted for CGPA.

The faculty assigned for this course will not be teaching / lecturing the course syllabus, rather will be a mentor who guides and monitors the student activities. The list of such offering courses and respective faculty members for each course will be decided by the department / school based on the availability of faculty members and all other resources, and a student cannot claim it as their right /authority to undergo such self-learning courses.

# Portfolio

An Engineering Portfolio is a document that highlights examples of students class work, Practice works and project works. It also serves as a motivation to carefully document engineering projects – always a worthwhile practice!

Engineering portfolio building is a compilation of anyone of or combination of anyone of the following such as designs, analysis, software module developments, hardware kits /boards, experimental trials, 3 D prototypes, etc.

An engineering portfolio should give the employer a sense of how students learned skills and experiences contributed to a specific project that he / she worked on, whether at a previous job, an internship, or in a school. It is a collection of work samples that students can bring to an interview or submit to a prospective employer, or even post online. They can provide evidence of work that have been done and which can illustrate their skills and abilities.

The courses from 3rd semester onwards which are having design component, analysis, software module developments, hardware kits /boards creation, experimental trials, 3-D prototypes and similar related components can be identified in the curriculum itself, by the respective department under the portfolio building category. One of the evaluation components-(CLA-II) shall be based on the PORTFOLIO, which can be evaluated by the respective course faculty member. The process of documenting or recording the portfolio can be decided in the course committee meeting which must be inventive to capture the distinctiveness of the course and also to give ample flexibility for each student to innovate, keeping in mind the overall consolidation of each student's portfolio at the end of 8th semester. For each student, the Portfolio document of each semester must be duly certified by the academic advisor/Head of the Department, mentioning the types of works and the content including the total number of pages of the document. Each Programme curriculum must have 5 courses with portfolio components from 3rd semesteronwards.

# Multidisciplinary Projects

(i) This MDP can be initiated from all the department along with the initiation of process for the final year major project at the 7th semester for all the UG B.Tech programmes in all the engineering departments

(ii) All the individual students from across the various engineering disciplines can frame a group with a maximum number of 6 students from across 3 or 4 departments at maximum.

(iii) In each MDP group of students, they must have one guide/supervisor from each representing department apart from the each panel faculty members from those representing department.

(iv) The complete process of execution, evaluation and assessments of these MDP are to be done as the central panel of MDP and in accordance /same as that of the intradepartmental projects.

(v) Those Central panel MDP can be grouped into three or four major domain groups according to the total number of MDPs from the CET and also the grouping is based on the types of projects which reflect the similarity of projects within the groups so that it can be conveniently identified as a single or one group. (domain)

(vi) The reviews will be scheduled in the common dates across the entire CET departments so that the ease of attending the reviews will be maintained for the faculty members and also for the students.

(vii) In all the departments, the entire intra department projects groups and all the MDP groups of all their department students, will be maintained and displayed for the assessments and evaluations.

(viii) There will be a one or two MDP coordinator(s) appointed by DEAN (CET) for each group as per the requirement to oversee all the activities.

(ix) In cases of any additional requirements or helps required for the completion of the projects, the panel members along with the project supervisors from all the departments will work together for the outcome and also make it a prototype for the product or proof of concept.

(x) One of the panel members can be appointed as internal examiners for the final evaluations for the grade and credits.

(xi) As far as possible sufficient motivation and the encouragement can be for the students to retain or choose such projects in every year.

(xii) An MDP project expo or demo can be organized so that the entire colleges in the campus will visit the expo and get benefitted.

# Open Book Assessment

**Open Book Test – An Introduction**

Open book test is a format of examination where the students are allowed to refer to the approved class notes, books or any other reference materials recommended by the faculty.

Thisformatofexamhelpstotesttheabilityofstudentstofindandapplyinformationandknowledge.Also such types of test motivate students to make notes, read books and explore more towards their learning. This type of test is proven to enhance higher order thinking skills of students. The mode of conduction and strategy is very important to extract the above mentioned advantages of open book test. The quality of question which are not readily extracted from sources and their ability to make students think are most important criteria for successful conduction of open book test.

Generally, the open book test can be of two type's namely traditional sit down/limited time test and take home type test where the questions are handed out and are returned in a specific amount of time.

**Courses and Implementation Strategy**

Each Department, based on the recommendation of HoD and other subject experts can decide a single theory course to be implemented for open book test. The course should be theoretical and numerical intensive for ease of conduction. On deciding the subject, HoD decides the subject handling faculties and course coordinator based on the expertise on the subject. HoD addressees the committee and lays out the important criteria for the smooth conduction of the course as listed below.

- Uniformity in the conduction of course across all batches.
- Complete course conduction plan by the course coordinator at least one month prior to the conduction of course. The plan should include the proposed lecture presentation for each topics listed in curriculum, books and materials, question paper pattern for each assessment, assignments.
- List of materials (book, e materials, notes) proposed for each internal assessment and final university exam (to begiven to students during the test)
- Summary of the feedback from the students after each assessment test.
- Following the selection of subject, the course coordinator conducts a meeting with other course handling faculties and decides the course action plan. The detailed course plan can be mapped to the format as given in Table 1.

Once the course plan and other materials are decided by the committee as listed above, the coordinator makes a detailed presentation to the HoD and expert members for their approval. The entire process till the final presentation should happen atleast 10days before the first class.

**Note: The course selected for the open book test should continue for atleast one regulation (or 3 years), assuming it is provided every odd/even semester, so that it could be refined to a better form based on the feedback.**

**Table.1Proposedpointfordiscussion**

| Points to be addressed | Action Plan |
|---|---|
| • Writeup/plan of execution of course for the information Of students. | |
| • Lecture content for each topic module wise | |
| • Books and materials required for the conduction Of course for each modules | |
| • Question paper pattern and questions for internal assessment (CT1, CT2andCT3) | |
| • Question paper pattern and questions for university Exam | |
| • Allowable reference materials for students for each assessment and university exam | |
| • Method to obtain feedback from students | |
| • Method to conduct mock test for the experience of students and understand various challenges in the conduction of university exam | |

## Study Notes

Study notes include the notes provided by the faculties (common across batches) and hand-written notes by the students, A notebook sealed by faculty in charge which contains only handwritten notes, only restricted sheets of paper which contain hand written notes (5-10 papers) sealed by the faculty in charge. Combination of notes provided by the faculties and restricted hand-written sheets of paper duly checked and sealed by faculty in charge.

## Online/e-materials

Thismaycontainpdfandotheronlinematerialsprovidedduringthecourse.Thiscanbe divided into two categories-Restricted Access -Each computer scan be provided with a folder that contains all relevant materials required for the test. Unrestricted Access -The students are not limited to any specific materials or internet sources. The students can use their laptops or phone to access any resources. Sharing of materials among students through email or any social media platform should be restricted. This can be allowed only when quality of questions are well maintained such that the solutions are not directly accessible and also the questions are time bound. These types of resources might be difficult for limited time test.

## Books

The course coordinator can request for sufficient number of reference books in dept. or central library prior to the start of course. Given the number of books might not be sufficient to cater the needs of all the students of class, they can maintain the photocopy of the parts of the books as reference and can bring the same to the exam hall.

## Exam pattern:

Exam pattern is an important factor for the smooth conduction of open book test. The pattern cannot be the general pattern followed for closed book test. The pattern should ensure quality of questions as well as the time. For a 3 hour Examination, the number of

questions can be reduced and instead of having single questions for each unit, questions can be combined in a wise manner with sub sections so that all the modules are covered.