

**CENTURION UNIVERSITY OF TECHNOLOGY & MANAGEMENT
ANDHRA PRADESH**

SCHOOL OF ENGINEERING AND TECHNOLOGY

ACADEMIC REGULATIONS-CBCS POLICY

B.TECH DEGREE PROGRAMMES



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2024

CENTURION UNIVERSITY OF TECHNOLOGY & MANAGEMENT
Tekkali Village, Nellimarla Mandal, Vizianagaram, Andhra Pradesh, INDIA-535003

Preface

The philosophy of B.Tech Curriculum design is to produce engineering graduates aiming for; **A. Higher studies B. Job, C. Entrepreneur.** The process involves input from Industry professional, Academician and Alumni. It is observed that a student chooses engineering discipline without proper information and exposure. The scope for change of discipline in a traditional curriculum is limited. In order to address the above issues University offers Choice Based Credit Systems curriculum w.e.f 2017.

1. Academic Regulations & Policies

This section gives an overview of the different Academic Rules and Regulation to be followed in the Centurion University of Technology and Management (CUTM) for the Bachelor of Technology Programs. Specifically, it contains information on Choice Based Credit System (CBCS), including Registration, Selection of Subjects, Time Table, Grading System, Examination Policy, Attendance Policy and Academic Rules applicable at CUTM.

1.1 Choice Based Credit System

The Choice Based Credit System (CBCS) is made available to all Engineering students.

1.11 A. Structure of Choice Based Credit System: BTech

Basket	Basket Category	Minimum Credits to be acquired	w.e.f 2024 batch
I	Foundation Courses in Sciences	17	17
II	Foundation Courses in Humanities & Management	12	12
III	Foundation Courses in Engineering	25	25
IV	Core Engineering Courses	58*	60*
V	Discipline/Domain Centric Courses	48	46
	Total Credits	160	160

* A Student needs to register all the subjects listed in Baskets IV for obtaining a BTech degree in that discipline/branch.

1.11 B. Structure of Choice Based Credit System: BTech with Honours

Basket	Basket Category	Minimum Credits to be acquired	w.e.f 2024 batch
I	Foundation Courses in Sciences	17	17
II	Foundation Courses in Humanities & Management	12	12
III	Foundation Courses in Engineering	25	25
IV	Core Engineering Courses	58*	60*
V	Discipline/Domain Centric Courses	48+20 **	46+20**
	Total Credits	180	180

* A Student needs to register all the subjects listed in Baskets IV for obtaining BTech degree in that discipline/branch.

** A student will be eligible to get Under Graduate degree (BTech) with Honours if he/she completes an additional 20 credits Domain courses from Basket V

1.11 C. Structure of Choice Based Credit System; BTech with additional Minor Engineering

Basket	Basket Category	Minimum Credits to be acquired	w.e.f 2024 batch
I	Foundation Courses in Sciences	17	17
II	Foundation Courses in Humanities & Management	12	12
III	Foundation Courses in Engineering	25	25
IV	Core Engineering Courses	58*+20#	60*+20#
V	Discipline/Domain Centric Courses	48	46
	Total Credits	180	180

* A Student needs to register all the subjects listed in Baskets IV for obtaining BTech degree in that discipline/branch.

A student will be eligible to get Under Graduate degree (BTech) with additional Minor Engineering, if he/she completes an additional 20 credits from Basket-IV of other branch/discipline.

1.11.1 Credit Weightages

Courses	Credits	Courses	Credits
Engineering Courses	3-5	Minor Project	2
Foundation Course in Sciences	3	Domain /Major Project	6
Humanities & Management	1/2	Internship–4weeks/8 weeks	2/4
Practice Course	2	CSR, NSS, NCC, SCOUT, etc.	0

1.12 Guidelines

- For CBCS “Programme” refers to “Engineering” study, “Course” refers to a discipline within programme say “Computer Science”, Completion of course will lead to award of degree in that course “Subject” refers to a unit of study under the course say “Refrigeration and Air-conditioning in Mechanical Engineering course. Subjects can have various credits viz; 2, 3, 4 etc.
- At the time of joining the University, the student need not be constrained by the engineering discipline she/he has chosen. The student has the flexibility to choose the required Credit from different baskets of Subjects, as she/he moves from one semester to next and graduate in her/his discipline(s) of interest.
- The student can choose her/his pace of Credit Acquisition based on a predetermined academic plan, with the support of faculty mentor.
- The entire syllabus is divided into Baskets of subjects comprising of Foundation Courses in Sciences (Basket I), Humanities & Management Sciences (Basket II), and Foundation Engineering Courses Sciences (Basket III); Core Engineering Courses Sciences (Basket IV); and Discipline/Domain Centric Courses Sciences (Basket V).
- From a portfolio of courses in each Basket, a student has the option of choosing any combination of Subjects, fulfilling minimum Credit requirement from that Basket.
- There is no limit on the number of Credits to be registered in any semester. However, while offering courses, all the subjects must be set in timetable without overlap and a subject must have minimum strength of students to offer. For the award of degree in a

particular discipline/branch, a student has to acquire 160 Credits and complete the requisite Credits from each basket.

- A student will be eligible to get Under Graduate degree with Honours if he/she completes an additional 20 credits Domain courses from Basket V or additional Minor Engineering, if he/she completes an additional 20 credits from Basket-IV of other branch (160+20).
- The student has the flexibility to decide the duration of his/her degree program completion period. However, the maximum duration that a student can take to graduate shall not be more than 8 years from the date of registration to the degree program.
- Subjects are divided in to different types, e.g. Theory, Practice, Project, Theory & Practice, Theory & Project, Practice & Project, and Theory & Practice & Project. A Student has no restriction on crediting any number of Subjects from any type. The student can obtain a certificate of acquisition of Skill for most of the Practice Subjects.
- Massive Open On-line Subjects (MOOCs) offered by any Premier Institute Globally can be credited by any student.
- Mini Project (2 credit) and Summer Internship (2 credit) are also part of Basket- V. Student can undertake mini project during any semesters and summer internship during each summer break of programme.
- A student must pass in all prerequisite subject(s), if any, before registering for a particular subject.
- While the student has the option of exercising her/his choice in crediting a subject, the same will not be offered by the University, if a minimum number of students do not register for the said subject. The concerned department/faculty will notify the minimum student requirements, based on their specific need.
- The CBCS is not for selecting a subject on the basis of how easy or difficult it is, but on the basis of student's goal of getting right employment/higher education/entrepreneurship. Accordingly, for every student, a dynamic course plan, aligned to his/her goal, needs to be in place.
- A student has the option of dropping a subject (midway/at the end of semester after failure) and register for a new subject of relevant basket in subsequent semester and fulfils the credit requirements.
- A student can take course from Basket-IV of other branch/discipline, which will be credited to Basket-V

1.13 Registration, Selection of Subjects & Time Table

This section gives the details of the University Registration Card, Registration to different Subjects and Time Table for Course work. Immediately after admission, the students' particulars are to be stored in ERP/MIS of the University. Any information related to the students required by any Department/Entity will be collected from the ERP/MIS only.

1.13.1 University Registration Card

A Student is issued University Registration Card after admission process. University Registration number continues to be his/her Registration Number for all examinations during his/her tenure of study. This card is also essential for attending classes in a college and appearing in examinations. This is an IMPORTANT document and the student must take care of it. Duplicate University Registration Card will be issued only after recommendation by the Dean of respective college on paying the prescribed fee.

1.13.2 Subject-wise Registration

All registered students of the University have to register for each of the subjects they are required to study before commencement of a semester. A student has to apply in a specified format for subject wise registration for each semester with prescribed fees to his/her college Dean. The same will be scrutinized and registration confirmation will be displayed on the notice board and in MIS. The following methodology is adopted for registration procedure.

- i. Head of the Departments to submit the titles of the subjects to be offered, for all the Baskets, to the Dean.
- ii. The MIS section has to upload all these subjects in the MIS/ERP.
- iii. One week slot will be provided to the students for counselling & registration in every semester.
- iv. Immediately after admission in the first year, each faculty mentor will be allotted 20 students for continuous guidance.
- v. It is the responsibility of faculty mentor and concerned HOD to counsel and make the students understand the CBCS and select the subjects of their choice (aligned to their goal). Student-wise tracker will be developed at the beginning of the first semester. It will consist of a portfolio of subjects keeping in mind student's goal (i.e. employment/higher education/entrepreneurship). Colleges will prepare slots for students and their faculty mentors for this purpose.

- vi. The Mentor concerned can make note of the subjects selected by his/her students from the tracker and then the students are guided to freeze these in MIS.
- vii. There is no restriction on the number of credits to be registered by any student, although expected normal credit load for a semester is 22 to 24 and 4 years is the minimum duration for award of degree.
 - A student can go at less than normal pace by registering fewer credits.
 - Further, a student can register for more than normal credits in a semester. He/she can judiciously credit Subjects in advanced topics, interdisciplinary areas and undertake skill Subjects and project works.
- viii. A Student is allowed to register for a subject only after clearing its pre requisites, if any.
- ix. After the choice lock, the time table will be finalised. Care will be taken to accommodate maximum number of students for the subject choices locked. Wherever it is not feasible, concerned student(s) will be guided to defer the subject chosen to future semesters and register another feasible subject.
- x. If any student does not register during the given slot or joins the college later, then he/she will have to exercise choice based on the time table.
- xi. Any student falling short of credits for graduation after the final semester examination, has the chance to complete the required shortfall by appearing the examination organised before the convocation of his/her batch.
- xii. MIS will show cumulative student credits under “My Credits”. A report on student wise credits can be obtained from MIS for documentation.

1.13.3 Time Table for Instructions

Each Department will provide the Time Table for the subjects being offered in a semester after the subject registration for that semester. The time table will indicate the name of the Subject facilitators.

1.13.4 Duration of Curriculum and Calendar

- Each year shall be divided into two Semesters – Autumn Semester (July to December) and Spring Semester (January to June). Students normally join in Autumn Semester. The number of teaching weeks in each semester will be 15 to 18 with a minimum of 90 teaching days, excluding the period of examination.

- Each year the University will draw out a calendar of academic and associated activities. Detailed curriculum and syllabi will be as decided by the Academic Council with provision for required modification.
- The duration of the programmes will take note of statutory provisions that come into effect from time to time. The minimum duration of the B. Tech degree programmes is four years/eight semesters. A student has the option to complete the B. Tech degree programme within eight (8) years.

1.14 Grading System & Degree Requirement

The University has a ten points grading system as below.

1.14.1 Categorization of Grades and Their Correlation

This section gives the details of the Grading system being followed by the University.

Qualification	Grade	Score on 100 Percentage Point	Point
Outstanding	‘O’	90 & above up to 100	10
Excellent	‘E’	80 & above but less than 90	9
Very Good	‘A’	70 & above but less than 80	8
Good	‘B’	60 & above but less than 70	7
Fair	‘C’	50 & above but less than 60	6
Pass	‘D’	40 & above but less than 50	5
Failed	‘F’	Below 40	2
Malpractice	‘M’	---	0
Absent	‘S’	---	0

N.B. Grade D shall be pass Grade for theory and Grade C shall be Pass Grade for Practical / Sessional / Project.

1.14.2 Definition of Terms

The terms used in the above table are defined as follows:

- Point – Integer equivalent of each letter grade
- Credit – Integer signifying the relative emphasis of individual Subject item(s) in a semester as indicated by the course structure and syllabus
- Credit Point – (b) multiplied by (a) for each Subject item
- Credit Index – Sum of Credit Points, [i.e. Sum of (c)] of Subject items in a semester

- e) Grade Point – (c) / (d)
- f) Grade Point Average – Represented by Grade Point Indices as per section 1.4.3.
 - Semester Grade Point Index (SGPI)
 - Cumulative Grade Point Index (CGPI)

1.14.3 Grade Point Index

The formulas for calculating the SGPI and CGPI are as follows:

$$SGPI = (\text{Credit Index}) / (\text{Sum of Credits for a Semester})$$

$$CGPI = (\text{Sum of Credit Index of all previous Semester}) / (\text{Credits of all previous Semesters}) \text{ up to a semester}$$

1.14.4 B. Tech Degree Requirements

There shall be no class / division awarded to a student either at semester or degree level. A candidate will be eligible for award of B. Tech degree if he/she satisfies all the following conditions:

- a) Has cleared all subjects with at least pass grade,
- b) Has obtained 160 Credits,
- c) Has obtained required Credits from each of the Baskets,
- d) Has obtained at least satisfactory grade in CSR activities (i.e. NCC/NSS/Games/Sports/Music/Debate/Quiz/Yoga) during the study period,
- e) Has no dues to the University, and
- f) Has no disciplinary action pending against him/her.

2. Examination Policy

The section on Examination Policy gives specific guidelines, rules of the Examination and expected Examination Code of Conduct.

2.1 Eligibility for Examinations

The eligibility criteria for appearing in the examinations of CUTM are as follows:

- A student has to maintain overall 75% attendance to be able to write all papers at end-semester examinations in a semester. The attendance is considered from the date of commencement of classes as per academic calendar of the university and is calculated based on the total number of working days available in a semester.
- The schedule of classes shall be notified through a time table before the beginning of the classes in the Semester. Attendance record will be compiled at the time of each class test and the students with poor attendance will be informed through notification. The guardian may be

informed through a letter/SMS. Letters will be issued to the student and the guardian before he/she is debarred for appearing at University examination due to shortage of attendance. Examination Section shall be informed about the list of eligible/ineligible students for the Examination. Dean will monitor students' attendance.

- Concessions: A student who has been absent for short periods on health ground or due to participation in cultural, sports and other academic/official assignments in the interest of students, with prior written permission of the Dean/Head of the Department shall be permitted a concession of 10% in attendance (i.e. will be eligible for appearing in examination with a minimum of 65% attendance).
- A student will be allowed to appear in the Semester Examination in those theory subjects where his/her attendance is not less than 75% in case he/she does not have 75% overall attendance.
- A candidate shall be allowed in a Semester Examination only after he/she is issued an Admit Card for the relevant examination by the University through the Examination Section of the College.
- Students who have been found to indulge in malpractice during examination will be awarded 'M' grade in that subject. The University will take appropriate disciplinary action, as per rule.
- A student who is absent in any subject(s) for which he/she has registered will be awarded 'S' grade. He/she is permitted to appear in those Subjects in subsequent semester examinations after compensating for the course work missed and obtaining due permission from the respective College and University.
- A student may register to appear in a semester examination which she/he has not passed, with appropriate fee.

2.2 Evaluation System

The University has a continuous evaluation system for each type of Subjects (Theory, Practice, Project, Theory + Practice, Theory + Project, Practice + Project, Theory + Practice + Project, workshop & internship). For this purpose the university holds the following examinations.

- End Semester Examinations at the end of the Odd and Even Semester course work.
- Examination on Demand (EOD) to be notified from time to time. In general, there will be two EOD's in each semester, in addition to a special EOD towards the end of Academic Year.

2.2.1. The Assessment Criteria of Internal and External Examinations for various types of subjects are as follows:

a. **Evaluation for Theory papers (T, TP & TPP)**

i. **End semester theory examinations (50% weightage):**

- a. Duration – 3 hrs
- b. Full Mark – 100. During result processing, it will be proportionately added.
- c. Distribution of marks (should cover all COs)
 - 10 short questions x 2 marks = 20 mark
 - 5 long questions x 12 marks = 60 marks
 - 4 short notes x 5 marks = 20 marks

ii. **Continuous assessments:** Details are as indicated in the table below:

SL No	Continuous Assessment	Score
1	Individual / Group Presentation <i>Rubric is as under:</i> <ul style="list-style-type: none"> • Content & creativity – 05 • Presentation & Discussion – 05 	10
2	Mid-semester (Written Examination) <i>Mark Distribution:</i> <ul style="list-style-type: none"> • 5 short questions x 1 marks = 5 marks • long questions x 5 marks = 10 marks • 2 short notes x 2.5 marks = 5 marks 	20
3	Assignment (2 assignments x 5 marks each)	10
4	Learning Record (<i>Based on the parameters indicated in the learning record format, course faculty to evaluate and award score</i>)	10
Total		50

Note: The evaluation pattern and external internal weightage for different programs under School of Pharmacy & Life Sciences as per PCI norms, School of Forensic Sciences as per NFSU, MSSSOA shall be as per ICAR regulations.

b. **Evaluation of Practice/ Laboratory Components**

The evaluation of the practice component will be carried out 50% by concerned faculty and 50% by the external examiner and will be conducted as per the present policy. Details are as under:

Internal

A	Concept	10
B	Planning & Execution/ Practical/ Simulation/ Programming	10
C	Result and Interpretation	10
D	Record/ Report	10
E	Viva	10
	Total	50

External

A	Execution & Result	20
B	Record of Applied and Action Learning	10
C	Viva	20
	Total	50

c. Evaluation of Project Component

The evaluation of the project component will be completed 50% by concerned faculty and 50% by the external examiner and will be conducted as per the present policy. Following guideline may be referred during evaluation of internal and external components:

Internal

A	Understanding the relevance, scope and dimension of the project	10
B	Methodology	10
C	Quality of Analysis and Results	10
D	Interpretations and Conclusions	10
E	Report	10
	Total	50

External

A	Understanding the relevance, scope, and dimension of the project	10
B	Report	20
C	Viva	20
	Total	50

d. **Evaluation of Internship**

The evaluation of the internship will be completed 50% by concerned faculty and 50% by the industry guide. Following guideline may be referred during evaluation of internal and external components:

Internal

A	Daily Diary & Log Report	20
B	Periodical (Weekly/Monthly) Report	10
C	Presentation & Viva	20
	Total	50

External

A	Completion of the task / project assigned	30
B	Feedback of the industry supervisor	20

e. **Evaluation of Workshop Component**

The evaluation of the workshop component will be completed 100% by concerned faculty as per the present policy. Following guideline may be referred during evaluation:

A	Critical Thinking/ Simulation/ Field work & Report	50
B	Presentation & Viva	50

- All Internal marks will be recorded in ERP and uploaded to EMS.
- Grading pattern to be followed as specified in the Subject Depository.

2.2.2 PASS CRITERIA

Student has to get Pass mark in all individual components of each subject.

- A. **Theory papers:** Students must secure a minimum of **30% in individual components** (both continuous assessment & end-semester theory) **along with 40% in aggregate**
- B. **Theory & practice papers:**
- a. Theory component: minimum of 30% in individual components (both continuous assessment & end-semester theory) along with 40% in aggregate
 - b. Practice component: minimum of 50% marks both in internal & external
- C. **Theory & project type papers:**
- a. Theory component: minimum of 30% in individual components (both continuous assessment & end-semester theory) along with 40% in aggregate

b. Project component: minimum of 50% marks both in internal & external

D. Theory, practice & project type papers:

a. Theory component: minimum of 30% in individual components (both continuous assessment & end-semester theory) along with 40% in aggregate

b. Practice component: minimum of 50% marks both in internal & external

c. Project component: minimum of 50% marks both in internal & external

E. Practice & project type papers:

a. Practice component: minimum of 50% marks both in internal & external

b. Project component: minimum of 50% marks both in internal & external

F. Workshop or Internship type papers: 50% in aggregate

Note: For further clarity, refer to the example given below table.

	Theory			Practice		Project		Full Mark	Result
	Full Mark								
	50	100	150	50	50	50	50		
	CA	ESTH	CA+ESTH	IPR	EPR	IPRO	EPRO		
Pass Criteria	30% (15)	30% (30)	40% (60)	50% (25)	50% (25)	50% (25)	50% (25)		
Subject Type									
Theory	15	30	45					150(×100)	Fail
Theory+Practice	15	30	45	25	25			250(×100)	Fail
TPP	15	30	45	25	25	25	25	350(×100)	Fail
Theory+Project	15	30	45			25	25	250(×100)	Fail
Theory	20	40	60					150(×100)	Pass
Theory+Practice	35	29	64	25	25			250(×100)	Fail
TPP	10	50	60	25	25	25	25	350(×100)	Fail
Theory+Project	15	45	60			25	25	250(×100)	Pass
Practice				25	25			100(×100)	Pass
Project						25	25	100(×100)	Pass
Workshop				50				100	Pass

- In case, a student gets” F” grade in theory course, he/ she will only appear for External component as the internal marks are locked. But, in case of combination courses, the student will have to appear for all the external components (theory + practice + project), even if the student has cleared in some/ failed in some of the components.
- Registration of a paper having pre-requisite condition indicates that, a student will only be allowed to register provided he/she has cleared the pre-requisite paper at the time of registration.
- A student may apply for rechecking and photocopy as per the norms.
- A student can appeal against the rechecking result(s) with a fee of Rs 5000/- per paper. The fee will be refunded to the student in case the revised result (marks) is 10% or more than the earlier rechecked marks.

2.2.2. Examination& evaluation systems for Back Papers

1. Back paper (Theory)

- a. Option 1: Students can re-register back paper subject during a semester (if it is offered in that semester), attend all class appear internal examination and end semester examination by paying requisite registration fee per subject. The previous internal/external marks will be invalid. The student will be evaluated and grades will be awarded as per the marks scored in the current session.
- b. Option 2: Student can appear EOD for external component only. This external mark along with previous internal marks scored by student will be considered for final grade. No scope for change in internal marks.

2. Back Paper (Lab/Practice/Workshop)

- a. Option 1: Student can re-register back paper during a semester (if it is offered in that semester) by paying requisite registration fee per subject. The previous internal/external marks will be invalid. The student will be evaluated and grades will be awarded as per the marks scored in the current session.
- b. Option 2: Student can re-register for summer course, conduct all Lab experiments and appear internal & external examination by paying requisite registration fee per subject. The previous internal/external marks will be invalid. The student will be evaluated and grades will be awarded as per the marks scored in the current session. Student has to pay exam fee as applicable.

3. Back Paper (T+P+P/T+P/P+P/Project)

- a. Option 1: Student can re-register during a semester (if it is offered in that semester) by paying requisite registration fee per subject. Student has to attend required theory class, conduct all Lab experiments/ does project, appear internal examination and end semester examination. The previous internal/external marks will be invalid. The student will be evaluated and grades will be awarded as per the marks scored in the current session.
- b. Option 2: Student can appear EOD for external components for Theory/Practice/Project only to clear back paper. The previous internal marks will be considered for final grade. No scope for change in internal marks.

2.2.3. Assessments of Projects, Internships & Seminars (In Domains & CBCS all)

a. Projects:

There will be Process and Output of the Project. Process will be dealt and marks will be given by Internal Faculty/ Guide. Output will be evaluated by External Examiner (External Examiner + Faculty committee of the Dept.). Internal Evaluation is 50% and External Evaluation is 50%.

Process will include Literature review, design/ techniques to be decided, Experiment/ testing/ simulation, Attendance, Observations/ viva.

Output will include Report, Product, Presentation etc.

Note: The project report can be of a new project/product development or working with continuing project/production. Students need to prepare a report based on the followings; new product development (if any): Product details, product feature, product design /drawing, scope, commercial production process, costing of product, use of product, equipment's used for production, safety and security measures, raw materials required, inventory management systems and quality standards & practice etc.

In case of operation & maintenance project student has to prepare report on O&M Role and Responsibilities, operation sequence and procedures, production control procedures, Input /Output procedures, Diagnostics and problem handling procedure, Maintenance procedures, Inventory Management, safety, testing, maintenance contracts, operation maintenance records, etc.

Internships:

- I. Student to maintain Log report/ daily report signed by company person in the field - 10% weightage
- II. Weekly Report submission (log report to be a part of the report) – 20% weightage
- III. Assessment Form will provide by university to be filled in by the company/ organisation where internship is done - 50% weightage
- IV. Presentation and Viva at Department level – 20% weightage.

b. Seminars:

- I. Report – 40% weightage
- II. Presentation --- 30% weightage
- III. Attendance & Participation in seminar talks given by other students for the course --- 30% weightage.

3. General

3.1 The academic regulations should be read as a whole for the purpose of interpretation.

3.2 In case of doubt or ambiguity in the interpretation of the above regulations, the decision of the Vice-Chancellor is final.

3.3 The University may change or amend the academic regulations at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the University.

BTECH CURRICULUM

Mission

To educate students in science and engineering, enabling them with necessary skill to contribute to the social, technological, and economic development of our state, nation, and global community, in an environment that fosters teamwork, cultural and intellectual diversity, a strong sense of public responsibility, and lifelong learning

Vision;

1. Provide the highest level of education in science and technology to produce competent, creative and imaginative engineers.
2. Create an intellectual reservoir to meet the various demands of the Industry/Society in facilitating employment, creating enterprise and to pursue higher studies/research.
3. Graduates will bring in to their careers the self-assurance, integrity, social values and technical strengths that drive innovation through communication ability and collaborative skills to inspire and guide the groups they work within, bringing their ideas to action.

POs: Engineering Graduates will be able to;

PO	Outcomes
PO1	Engineering knowledge: Apply knowledge of mathematics, science, Engineering fundamentals, and electronics engineering to the solution of engineering problems
PO2	Problem analysis: Identify, formulate, review literature and analyze electronics engineering problems to design, conduct experiments, analyze data and interpret data
PO3	Design /development of solutions: Design solution for electronics engineering problems and design system component of processes that meet the desired needs with appropriate consideration for the public health and safety, and the cultural, societal and the environmental considerations
PO4	Conduct investigations of complex problems: Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in electronics engineering
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to electronics engineering activities with an understanding of the limitations

PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to electronics engineering practice
PO7	Environment and sustainability: Understand the impact of the electronics engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the electronics engineering practice
PO9	Individual and team work: Function affectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings in electronics engineering
PO10	Communication: Communicate effectively on complex engineering activities with the engineering committee and with society at large, such as, being able to comprehend and write affective reports and design documentation, make effective presentations in electronics engineering
PO11	Project Management and finance: Demonstrate knowledge & understanding of the electronics engineering principles and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments in electronics engineering
PO12	Life- long learning: Recognize the need for, and the preparation and ability to engage in independent research and lifelong learning in the broadest contest of technological changes in electronics engineering

PSOs: Department of Mechanical Engineering

PSO1. Graduates will develop hands-on skills related to Manufacturing, Design, Welding and Automobile field

PSO2. Graduates will have competency to develop product using Software like CATIA, Pro-E, Solid works, ENOVIA, SIMULIA, ANSYS, Master CAM & Delcam for product design, simulation, analysis and manufacturing.

PSO3. Graduates will able to qualify GATE and other PSU examinations.

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	M	H	H	H	M	L	L	H	M	H	H
PSO2	H	H	H	M	H	M	M	M	M	L	M	H
PSO3	H	H	L	L	M	M	,M	H	L	M	L	H

PSOs: Department of Electrical and Electronics Engineering

PSO1. Graduates can use their skills gained in the domain to work in Industrial Automation/Transformer Manufacturing/Distribution of Power/Renewable Energy.

PSO2. Demonstrate proficiency in use of software & hardware to be required to practice Electrical Engineering profession.

PSO3. Graduates will able to qualify GATE and other PSU examinations.

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	M	H	H	H	M	L	L	H	M	H	H
PSO2	H	H	H	M	H	M	M	M	M	L	M	H
PSO3	H	H	L	L	M	M	,M	H	L	M	L	H

PSOs: Department of Computer Science & Engineering

PSO1. Graduate will be able work on high-end technology at IT Services industries.

PSO2. Graduate can acquire industry certified level of competency and work on real time IT application projects viz; Health/Agriculture/Security/Data Management etc.

PSO3. Graduate can start its own IT service company to provide technical solution

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	M	M	H	H	M	M	H	H	M	H	H
PSO2	H	H	H	H	H	H	M	H	M	H	H	H
PSO3	H	H	L	L	H	H	H	H	H	M	H	H

PSOs: Department of Electronics and Communication Engineering

PSO1. Graduates will apply their learning outcome of the programme creatively and productively in the fields Embedded Systems, VLSI and Communication Systems.

PSO2. Solving real life problems, design and develop novel products that are technically sound, economically feasible and socially acceptable.

PSO3. Add value to interdisciplinary area in providing solution in agriculture, manufacturing and security services

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	M	M	H	H	M	M	H	H	M	H	H
PSO2	H	H	H	H	H	H	M	H	M	H	H	H
PSO3	H	H	L	L	H	H	H	H	H	M	H	H

PSOs: Department of Civil Engineering

PSO1. Graduates will have the ability to plan, design and analyse building structural system and smart city planning.

PSO2. Graduates will have the ability to provide design solution to water supply, sewage system and land management.

PSO3. Graduates will have professional ethics and morals to formulate and solve civil engineering problems that serve the society.

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	M	M	H	H	M	M	H	H	M	H	H
PSO2	H	H	H	H	H	H	M	H	M	H	H	H
PSO3	H	H	L	L	H	H	H	H	H	M	H	H

PSOs: Department of Biotechnology

PSO1. Graduate will be able to develop Medicine, Pharmaceuticals, Agriculture, Plant based clothes, Shelter and also in household requirements

PSO2. Graduate can do production of synthetic drugs, hybrid vegetables, low cost fuels, advanced fertilizers, biopesticides, zero environmental pollution for an eco-friendly environment.

PSO3. Graduate will be able to do research, publication and patent.

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	H	H	H	H	M	H	H	M	M	M	H
PSO2	H	H	H	H	H	H	H	H	M	M	M	H
PSO3	H	H	H	H	H	M	M	M	M	M	M	H

PSOs: Department of Mining

PSO1. Graduate will be able to think critically and analyze effectively in all fields of opencast mining, underground both metal and nonmetal mines.

PSO2. Graduate will have ability to apply disciplinary knowledge and skills in solving critical problems in opencast mines, mineral extraction, blasting and environmental related issues.

PSO3. Graduate will be able to use software and technologies that can be effectively implemented to improve mine safety and productivity.

Mapping PSOs with POs (Scale of High, Medium and Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PSO1	H	H	M	M	H	H	H	M	M	M	M	H
PSO2	H	H	H	H	H	M	M	M	M	M	M	H
PSO3	H	M	H	H	H	M	M	M	M	M	M	H

Scale: H: High, M: Medium, L: Low,

Course Outcomes:

Course Outcomes (COs)	Competency/skill
CO1	Knowledge
CO2	Analytical and Creative Thinking
CO3	Problem Solving
CO4	Leadership & Management
CO5	Domain Skill/Competency
CO6	Product/Publication/Patent
CO7	Information Literacy
CO8	Employability skill/ Higher study/ Entrepreneurship

Designing the program curriculum

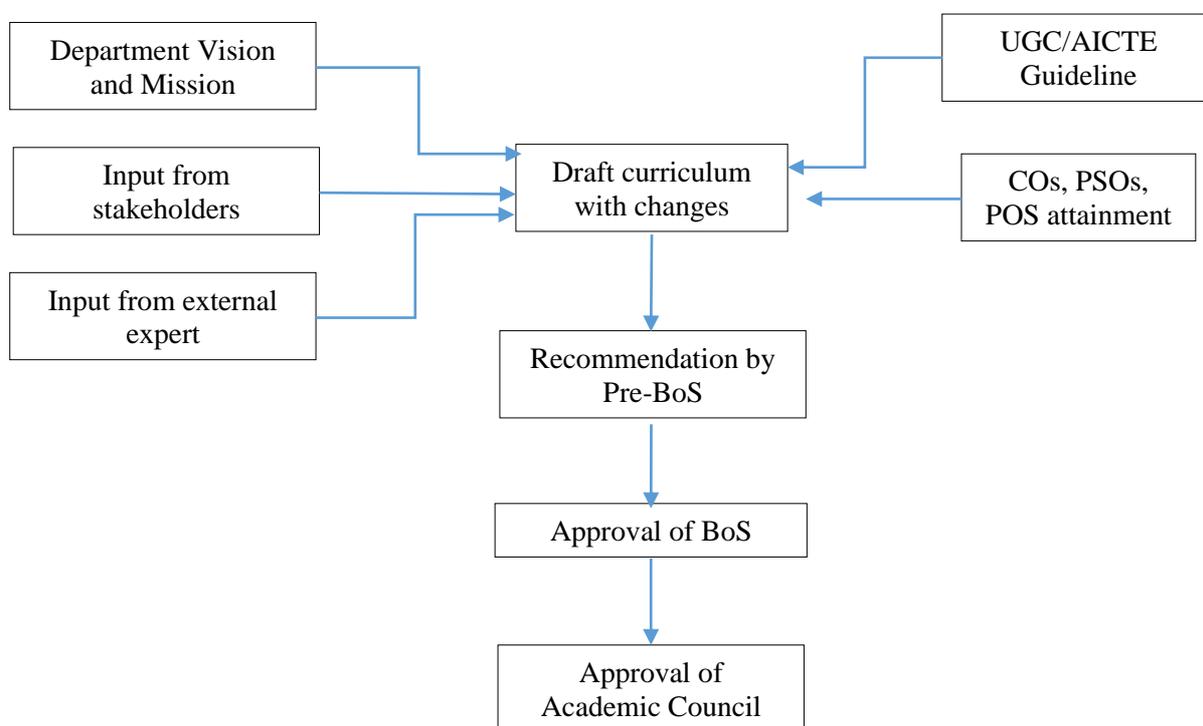
Step-1: Faculty Council prepares draft curriculum / curricular changes based on the following:

- Department Vision and Mission
- Program Educational Objectives
- Conclusions drawn from analysis of attainment of COs, PSOs, POs
- Input from Industry Professionals/Practitioners/Recruiters, Alumni, Students
- Guidelines of statutory bodies, such as, AICTE / UGC

Step-2: Conduct pre-Board of Studies (pre-BoS) meeting to discuss the draft curriculum and recommend necessary changes.

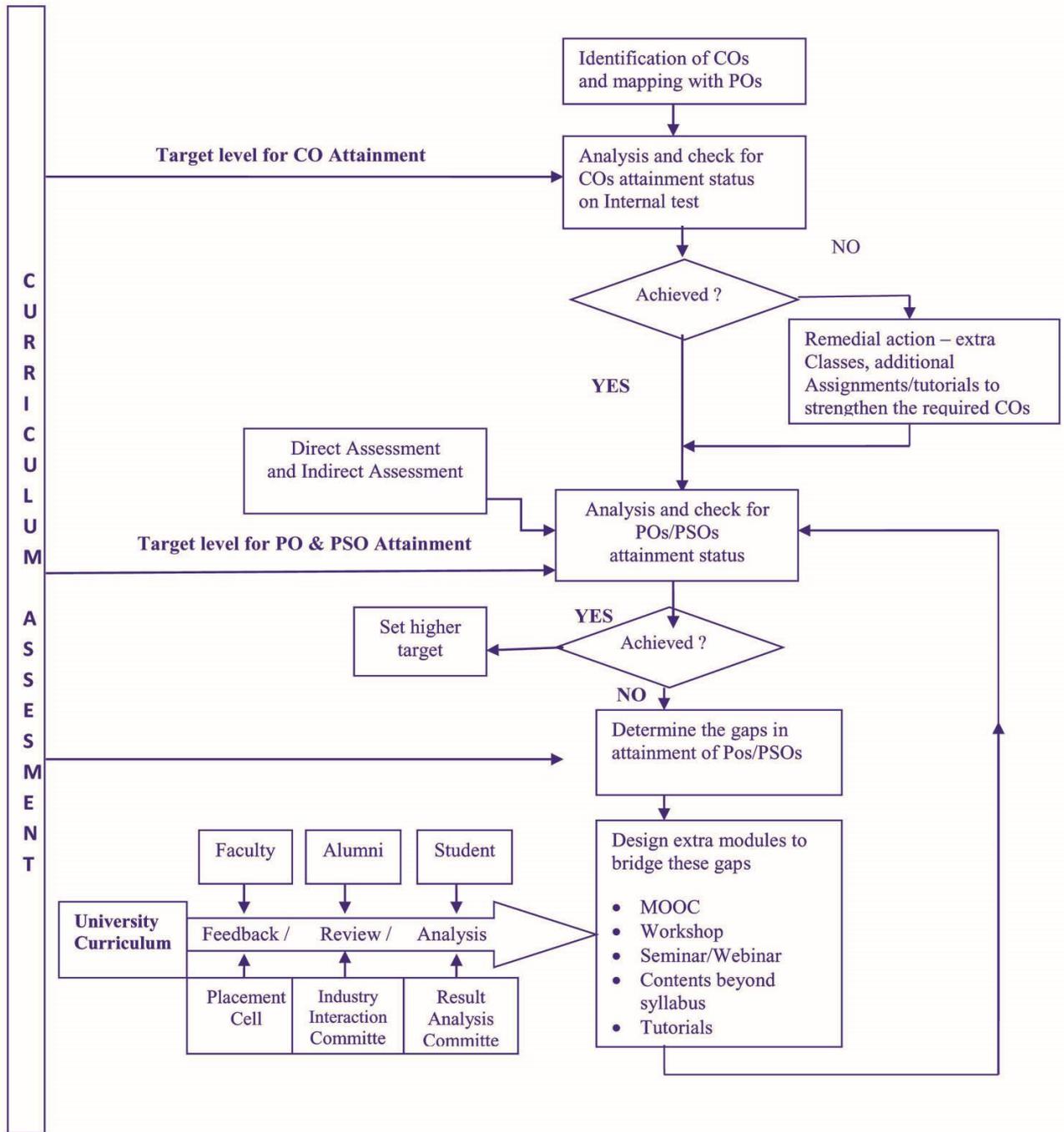
Step-3: Conduct Board of Studies (BoS) meeting to finalize the curriculum and syllabi.

Step-4: Submit the final curriculum for approval to Academic Council.



Flow chart for design/ revision of Program Curriculum and Syllabi

Process of measuring Programme outcome and design of curriculum



BTech Curriculum

Basket I

Course Code	Course Title	Credits	Course Type T+P+PJ
CUTM1001	Differential Equations and Linear Algebra	3	2+0+1
CUTM1002	Laplace & Fourier Transforms	3	2+0+1
CUTM1003	Complex Analysis & Numerical Methods	3	2+0+1
CUTM1004	Discrete Mathematics	3	2+0+1
CUTM1005	Probability & Statistics	3	2+0+1
CUTM1925	Calculus	3	2+0+1
CUTM1006	Mechanics for Engineers	3	2+1+0
CUTM1007	Optics and Optical Fibres	3	2+1+0
CUTM1008	Applied Analytical Chemistry	3	2+1+0
CUTM1009	Applied Engineering Materials	3	2+0+1
CUTM1010	Environmental Studies	2	0+0+2

Basket - II

Course Code	Course Title	Page No
CUTM1011	Optimisation Techniques	36
CUTM1012	Engineering Economics and Costing	38
CUTM1013	Project Management	40
CUTM1014	Gender, Human Rights and Ethics	42
CUTM1015	Climate Change, Sustainability and Organization	47
CUTM1016	Job Readiness	51

Basket - III

Course Code	Course Title	Page No
CUTM1017	Industrial IOT and Automation	58
CUTM1018	Data Analysis and Visualisation using Python	61
CUTM1019	Machine Learning using Python	63
CUTM1020	Robotic automation with ROS and C++	65
CUTM1021	Basics of Design Thinking	68
CUTM1022	System Integration with DYMOLA	70
CUTM1023	Smart Engineering Project (G2M)	75

Basket-IV:

This basket consists of core engineering courses and a student needs to complete the all credits as mentioned in the table 1.1 in the respective basket -IV to obtain the degree in that particular course.

A student can take course from Basket-IV of other branch/discipline, which will be credited to Basket-V

Basket-V:

This basket consists of Discipline/Domain centric courses, Skills for success (SFS) courses, internships, minor projects, major projects, summer internships etc.

All Basket-IV & Basket-V courses are available in the link given below:

[CUTM Course-Repository-2021_26.02-1.pdf](#)

Detailed syllabus of particular subject is available in the given link:

[Courseware :: Centurion University – Shaping Lives Empowering Communities \(cutm.ac.in\)](#)
