PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956

Approved by AICTE, New Delhi

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

School of Engineering

Bachelor of Technology Degree

Program Regulations and Curriculum 2019-2023

B. Tech. (Electronics and Communication Engineering)

2019-2023

Regulation No.: PU/AC-20.6/ECE16/ECE/2019-23

Resolution No. 6 of the 20th Meeting of the Academic Council held on 15th February, 2023, and ratified by the Board of Management in its 21st Meeting held on 22nd February, 2023.

February 2023

REGISTRAR

Registrar
PRESIDENCY UNIVERSITY
BANGALORE

Bachelor of Technology Degree
Program Regulations and Curriculum, 2019-2023

In exercise of the powers conferred by and in discharge of duties assigned under the relevant provision(s) of the Act, Statutes and Academic Regulations, 2019 of the University, the Academic Council hereby makes the following Regulations, namely;

Preliminary:

Short Title and Commencement

(a) These Regulations shall be called the **Bachelor of Technology Degree Program Regulations and Curriculum 2019-2023**.

(b) These Regulations are subject to, and, pursuant to the Academic Regulations, 2019

(c) These Regulations (with amendments) shall be applicable to the on going Bachelor of Technology Degree Programs of the 2019-2023 batch and to all other Bachelor of Technology Degree Programs which may be introduced in future.

(d) These Regulations (with amendments) shall supersede all the earlier Bachelor of Technology Degree Program Regulations and Curriculum, along with all the amendments thereto.

(e) These Regulations shall come into force with immediate effect

Definitions:

*In these Regulations, unless the context otherwise requires:*

a) *"Academic Council" means the Academic Council of the University;*

b) *"Academic Regulations" means the Academic Regulations, 2019 of the University;*

c) *"Academic Term" means a Semester or Summer Term;*

d) *"Act" means the Presidency University Act, 2013;*

e) *"Board of Examinations (BOE)" means the Board of Examinations of the University;*

f) *"Board of Management (BOM)" means the Board of Management of the University;*

g) *"CGPA" means Cumulative Grade Point Average as defined in the Academic Regulations, 2019;*

h) *"Clause" means the duly numbered Clause, with Sub-Clauses included, if any, of these Regulations;*

i) *"Course" means, a specific subject usually identified by its Course Code and Course Name, with specified Credit Structure and Credits, Course Description/Content/ Syllabus, a set of textbooks/references, taught by assigned Course Instructor(s) to a specific class (group of students) during a specific Academic Term;*

j) *"Course Instructor" means the faculty member who is the Teacher/Course Instructor for the concerned Course;*

k) *"DAC" means, the Departmental Academic Committee;*

l) *"Dean" means the Dean of the concerned School;*

m) *"HOD" means the Head of the Concerned Department;*

n) *"Parent Department" means the department that offers the Degree Program that a student undergoes;*

o) *"Program" means the Bachelor of Technology (B.Tech) Degree Program;*

p) *"Program Regulations" means the Bachelor of Technology Degree Program Regulations and Curriculum, 2019-2023;*

q) *"Registrar" means the Registrar of the University;*

r) *"SGPA" means the Semester Grade Point Average as defined in the Academic Regulations, 2019;*

s) *"School" means a constituent institution of the University established for monitoring, supervising and guiding, teaching, training and research activities in broadly related fields of studies;*

t) *"Section" means the duly numbered Section, with Clauses included in that Section, of these Program Regulations;*

u) *"Statutes" means the Statutes of Presidency University;*

v) *"Sub-Clause" means the duly numbered Sub-Clause of these Program Regulations;*

w) *"Summer Term" means an additional Academic Term conducted during the summer break (typically in June-July) for a duration of about eight (08) calendar weeks, with a minimum of thirty (30) University teaching days, and,*

x) *"University" means Presidency University, Bengaluru;*

1.0   INTRODUCTION:

1.1   The **Academic Regulations, 2019** are applicable to all existing Degree Programs of the University. The Academic Regulations, and any amendments made therein, shall also be applicable to new Degree and Diploma Programs that may be offered by the University in future.

1.2   The **Bachelor of Technology Degree Program Regulations and Curriculum, 2019-2023** are subject to, and, pursuant to the Academic Regulations, 2019.

1.3   These Program Regulations shall be applicable to the following on going **Bachelor of Technology (B.Tech) Degree Programs of 2019-2023:**

1.3.1   Bachelor of Technology in Civil Engineering, abbreviated as B.Tech (Civil Engineering);

1.3.2   Bachelor of Technology in Computer Science and Engineering, abbreviated as B.Tech (Computer Science and Engineering);

1.3.3   Bachelor of Technology in Electronics and Communication Engineering, abbreviated as B.Tech (Electronics and Communication Engineering);

1.3.4   Bachelor of Technology in Electrical and Electronics Engineering, abbreviated as B.Tech (Electrical and Electronics Engineering);

1.3.5   Bachelor of Technology in Mechanical Engineering, abbreviated as B.Tech (Mechanical Engineering);

1.3.6   Bachelor of Technology in Petroleum Engineering, abbreviated as B.Tech (Petroleum Engineering);

1.3.7   Bachelor of Technology in Computer Engineering, abbreviated as B.Tech. (Computer Engineering);
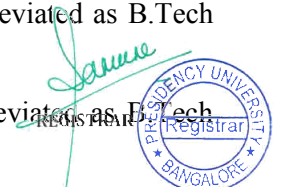
1.3.8   Bachelor of Technology in Computer and Communication Engineering, abbreviated as B.Tech. (Computer and Communication Engineering);

1.3.9   Bachelor of Technology in Information Science and Engineering, abbreviated as B.Tech. (Information Science and Engineering); and

1.3.10   Bachelor of Technology in Information Science and Technology, abbreviated as B.Tech. (Information Science and Technology).

1.3.11   Bachelor of Technology in Electronics and Computer Engineering, abbreviated as B.Tech. (Electronics and Computer Engineering).

1.4   These Program Regulations shall be applicable to other similar programs, which may be introduced in future.

1.5   These Program Regulations may evolve and get amended or modified or changed through appropriate approvals from the Academic Council, from time to time, and shall be binding on all concerned.

1.6   The effect of periodic amendments or changes in the Program Regulations, on the students admitted in earlier years, shall be dealt with appropriately and carefully, so as to ensure that those students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised Program Regulations, without any undue favour or considerations.

1.7   These Program Regulations are structured as follows:

1.7.1   **Part A:** Specific regulations relevant to the Bachelor of Technology (B.Tech) Degree Programs in pursuant of the provisions in Section 6.0 of the Academic Regulations, 2019 of the University.

1.7.2   **Part B:** Program Curriculum for the specific on going Bachelor of Technology (B.Tech) Degree Program of study as enumerated and named in Clause 1.3.

2.0   PART A: PROGRAM SPECIFIC REGULATIONS

2.1   Program Description and Duration

B.Tech. Degree Programs are offered in the following branches/disciplines by the respective parent Departments as indicated in Table 1 below:

Table 1

B. Tech. Degree Programs and Respective Parent Departments

S. No.	B. Tech. Program (Branch/Discipline)	Parent Department
1	B. Tech. (Civil Engineering)	Department of Civil Engineering
2	B. Tech. (Computer Engineering)	Department of Computer Science

3	B. Tech. (Computer and Communication Engineering)	and Engineering
4	B. Tech. (Computer Science and Engineering)	
5	B. Tech. (Information Science and Engineering)	
6	B. Tech. (Information Science and Technology)	
7	B. Tech. (Electronics and Communication Engineering)	Department of Electronics and Communication Engineering
8	B. Tech. (Electronics and Computer Engineering)	
9	B. Tech. (Electrical and Electronics Engineering)	Department of Electrical and Electronics Engineering
10	B. Tech. (Mechanical Engineering)	Department of Mechanical Engineering
11	B. Tech. (Petroleum Engineering)	Department of Petroleum Engineering

Bachelor of Technology Degree Program is a Four-Year, Full-Time Semester based program. The minimum duration of the B.Tech Program is four (04) years and each year comprises of two academic Semesters (Odd and Even Semesters) and hence the duration of the B.Tech program is eight (08) Semesters.

2.2 **Admission Criteria to the Four-Year Bachelor of Technology (B.Tech) Degree Programs**
The University admissions shall be open to all persons irrespective of caste, class, creed, gender or nation. All admissions shall be made on the basis of merit in the qualifying examinations; Provided that forty percent of the admissions in all Programs of the University shall be reserved for the students of Karnataka State and admissions shall be made through a Common Entrance Examination conducted by the State Government or its agency and seats shall be allotted as per the merit and reservation policy of the State Government from time to time**.**

The admission criteria to the B.Tech Program are listed in the following Sub-Clauses.

2.2.1 An applicant who has successfully completed Pre-University course or Senior Secondary School Course (+2) or equivalent such as (11+1), 'A' level in Senior School Leaving Certificate Course from a recognized University of India or outside or from Senior Secondary Board or equivalent, constituted or recognized by the Union or by the State Government of that Country for the

purpose of issue of qualifying certificate on successful completion of the course, may apply for and be admitted into the Program.

2.2.2   Provided further, the applicant must have taken Physics and Mathematics as compulsory subjects in the Pre-University/Higher Secondary / (10+2) / (11+1) examination, along with either Chemistry/ Biology/ Electronics/ Computer Science/ Biotechnology subject, and, the applicant must have obtained a minimum of 45% of the total marks (40% in case of candidates belonging to the Reserved Category as classified by the Government of Karnataka) in these subjects taken together.

2.2.3   The applicant must have appeared for Joint Entrance Examinations (JEE) Main / JEE (Advanced) / Karnataka CET / COMED-K, or any other State-level Engineering Entrance Examinations.

2.2.4   Reservation for the SC/ST and other backward classes shall be made in accordance with the directives issued by the Government of Karnataka from time to time.

2.2.5   Admissions are offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission, issued from time to time, by the Government of India.

2.2.6   Candidates must fulfil the medical standards required for admission as prescribed by the University.

2.2.7   If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation and any other falsification, the Registrar shall report the matter to the Board of Management (BOM), recommending revoking the admission of the candidate.

2.2.8   The decision of the BOM regarding the admissions is final and binding.

2.3   Lateral Entry

The University admits students directly to the second year (3rd Semester) of the B.Tech Degree Program as per the provisions and/or regulations of the Government of Karnataka pertaining to the "Lateral Entry" scheme announced by the Government from time to time.

Further, the general conditions and rules governing the provision of Lateral Entry to the B.Tech Program of the University are listed in the following Sub-Clauses:

2.3.1   Admission to 2nd year (3rd Semester) of the B.Tech Degree program shall be open to the candidates who are holders of a 3-year Diploma in Engineering (or equivalent qualification as recognized by the University), who have secured not less than forty five percentage (45%) marks in the final year examination (fifth and sixth Semesters of the Diploma Program) in the appropriate branch of Engineering. Provided that, in case of SC/ST and OBC candidates from Karnataka the minimum marks for eligibility shall be forty percent (40%).

2.3.2   Provided further that, candidates seeking Lateral Entry may be required to complete specified bridge Courses as prescribed by the University. Such bridge Courses, if any, shall not be included in the CGPA computations.

2.3.3   All the existing Regulations and Policies of the University shall be binding on all the students admitted to the Program through the provision of Lateral Entry.

2.3.4   The Course requirements prescribed for the 1st Year of the B.Tech Program shall be waived for the student(s) admitted through Lateral Entry and the

duration of the B.Tech Program for such students is three (03) years, commencing from the 3rd Semester (commencement of the 2nd Year) of the B.Tech Program and culminating with the 8th Semester (end of the 4th Year) of the B.Tech Program.

2.3.5   The existing Program Regulations of the concerned Program to which the student is admitted through the provision of Lateral Entry shall be binding on the student with effect from the 3rd Semester of the Program. i.e., the Program Structure and Curriculum from the 3rd to 8th Semesters of the Program concerned shall be binding on the student admitted through Lateral Entry. Further, any revisions/amendments made to the Program Regulations thereafter, shall be binding on all the students of the concerned Program.

2.3.6   All the Courses (and the corresponding number of Credits) prescribed for the 1st Year of the concerned B.Tech Program shall be waived for the student(s) admitted to the concerned B.Tech Program through Lateral Entry. Further, the *Minimum Credit Requirements* for the award of the B.Tech Degree in the concerned Program shall be prescribed/calculated as follows:

The *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree prescribed by the concerned Bachelor of Technology Degree Program Regulations and Curriculum, 2019-2023, minus the number of Credits prescribed for the 1st Year (total number of Credits prescribed for the 1st and 2nd Semesters) of the B.Tech Program.

For instance, if the *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree as prescribed by the Regulations for B.Tech (Computer Science and Engineering) is "N" Credits, and, if the total credits prescribed in the 1st Year (total credits of the 1st and 2nd Semesters) of the Program concerned is "M" Credits, then the *Minimum Credit Requirements* for the award of the B.Tech in Computer Science and Engineering for a student who joins the Program through the provision of the Lateral Entry, shall be "N – M" Credits.

2.3.7   Further, no other waiver except the Courses prescribed for the 1st year of the B.Tech Program of the University shall be permissible for students joining the B.Tech Program through the provision of Lateral Entry.

2.4   Transfer of student(s) from another recognized University to the 2nd year (3rd Semester) of the B.Tech Program of the University

A student who has completed the 1st Year (i.e., passed in all the Courses/Subjects prescribed for the 1st Year) of the B.Tech / B.E. /B.S., Four-Year Degree Program from another recognized University, may be permitted to transfer to the 2nd Year (3rd Semester) of the B.Tech Program of the University as per the rules and guidelines prescribed in the following Sub-Clauses:

2.4.1   The concerned student fulfils the criteria specified in Sub-Clauses 2.3.1, 2.3.2 and 2.3.3.

2.4.2   The student shall submit the Application for Transfer along with a non-refundable Application Fee (as prescribed by the University from time to time) to the University no later than July 10 of the concerned year for admission to

the 2nd Year (3rd Semester) B.Tech Program commencing on August 1 on the year concerned.

2.4.3   The student shall submit copies of the respective Marks Cards/ Grade Sheets/ Certificates along with the Application for Transfer.

2.4.4   The transfer may be provided on the condition that the Courses and Credits completed by the concerned student in the 1st Year of the B.Tech/B.E./B.S. Four Degree Program from the concerned University, are declared equivalent and acceptable by a Committee constituted by the Vice Chancellor for this purpose. Further, the Committee may also prescribe the Courses and Credits the concerned students shall have to mandatorily complete, if admitted to the 2nd Year of the B.Tech Program of the University.

2.4.5   The Branch/Discipline allotted to the student concerned shall be the decision of the University and binding on the student.

2.5   Change of Branch/ Discipline

A student admitted to a particular Branch of the B.Tech Program will normally continue studying in that Branch till the completion of the program. However, the University reserves the right to provide the option for a change of Branch, or not to provide the option for a change of Branch, at the end of 1st Year of the B.Tech Program to eligible students in accordance with the following rules and guidelines: framed by the University from time to time.

2.5.1   Normally, only those students, who have passed all the Courses prescribed for the 1st Year of the B.Tech Program and obtained a CGPA of not less than 6.00 at the end of the 2nd Semester, shall be eligible for consideration for a change of Branch.

2.5.2   Change of Branch, if provided, shall be made effective from the commencement of the 3rd Semester of the B.Tech Program. There shall be no provision for change of Branch thereafter under any circumstances whatsoever.

2.5.3   The student(s) provided with the change of Branch shall fully adhere to and comply with the Program Regulations of the concerned Branch of the B.Tech Program, the Fee Policy pertaining to that Branch of the B.Tech Program, and, all other rules pertaining to the changed Branch existing at the time.

2.5.4   Change of Branch once made shall be final and binding on the student. No student shall be permitted, under any circumstances, to refuse the change of Branch offered.

2.5.5   The eligible student may be allowed a change in Branch, strictly in order of *inter se* merit, subject to the conditions given below:

2.5.5.1   The actual number of students in the third Semester in any particular Branch to which the transfer is to be made, should not exceed the intake fixed by the University for the concerned Branch; and,

2.5.5.2   The actual number of students in any Branch from which transfer is being sought does not fall below 75% of the total intake fixed by the University for the concerned Branch.

2.5.6 The process of change of Branch shall be completed within the first five days of Registration for the 3rd Semester of the B.Tech Program.

2.6 Professional Practice Courses

Professional Practice Courses (Professional Practice – I and Professional Practice – II) are practice based Courses with the objective to equip students with the skills of problem identification, root cause analysis and problem solving, innovation and design thinking through industry exposure and project based learning. The expected outcomes are first level proficiency in problem solving and design thinking skills to better equip B.Tech graduates for their professional careers.

The method of evaluation and grading for the Professional Practice Courses shall be prescribed and approved by the concerned Departmental Academic Committee (refer Annexure A of the Academic Regulations, 2019). The same shall be prescribed in the Course Handout.

2.7 Professional Practice – I

Professional Practice – I is a 5 - Credit Course. This first level practice based course is conducted after the 4th Semester of the B.Tech Program, during the summer break (usually June – July), in accordance with the following options and guidelines:

2.7.1 ***Internship Program in an Industry/ Company:***
A student may undergo an Internship Program for a period of 6 – 8 weeks in an Industry/ Company, subject to the following conditions:

2.7.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

2.7.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, and any other qualifying criteria) as applicable/ stipulated by the concerned Industry/ Company for award of the Internship to a student;

2.7.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of internships shall be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.8.1.2 above.

2.7.1.4 A student may opt for Internship in an Industry/Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

2.7.1.5 A student selected for an Internship in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

2.7.2 **Project Work:**

A student may opt to do a Project Work in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

2.7.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

2.7.2.2 The student may do the project work in an Industry/ Company/ Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.8.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the project work will be conducted in accordance with the Program Regulations and requirements of the University.

2.8 *Professional* **Practice – II**

Professional Practice - II is an intensive practice based course with 15 Credits offered during the final (4th) year of the B.Tech Program. Students may register for Professional Practice – II in either the 7th Semester or the 8th Semester of the B.Tech Program, in accordance with the following guidelines:

2.8.1 *Internship Program in an Industry/Company:*

A student may undergo an Internship Program for a period of about 15 weeks in an Industry/ Company, subject to the following conditions:

2.8.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

2.8.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, any other qualifying criteria) as applicable/stipulated by the concerned Industry/ Company for award of Internship to a student;

2.8.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of Internships will be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.9.1.2 above.

2.8.1.4 A student may opt for Internship in an Industry/Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

2.8.1.5 A student selected/ awarded an Internship Program in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

2.8.2 *Project Work and Dissertation:*
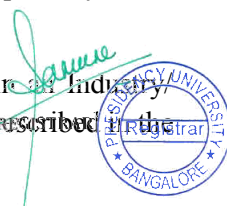
A student may do an extensive Project Work (with a Dissertation) in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

2.8.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

2.8.2.2 The student may do the Project Work in an Industry/ Company/ Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.9.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the Project Work will be conducted in accordance with the Program Regulations and requirements of the University.

2.9 **Social Immersion Courses**

The objective of a Social Immersion Course (SIC) is to sensitize and inculcate commitment to social and environmental issues and make a contribution through service and experiential learning. The outcome is to produce graduates who are sensitized and committed to serving the social and environmental needs of society.

The SIC is a 1- Credit Course coordinated by the parent Department or a group of Departments and the student is required to complete this course ideally during any of the Semesters of the 2nd or 3rd Year of the B.Tech Program. The nature and details of the SIC shall be approved by the concerned Departmental Academic Committee (DAC). As per the Academic Regulations, the 'S' grade is awarded for "satisfactory completion" of the Course and 'NC' grade is awarded for "non-completion" of the Course. The student who receives the "NC" grade shall repeat the SIC (it may be another type of SIC as approved by the concerned DAC) until the concerned student secures the "S" grade in the SIC. The "S" and "NC" grades do not carry grade points and hence not included in the SGPA, CGPA computations.

2.10 **Open Electives**

Open Electives are Courses offered by any Department/School of the University. The primary objective of offering Open Electives is to provide interdisciplinary/ transdisciplinary learning experiences. The outcome is a graduate with a fair exposure to disciplines beyond the chosen Branch in the B.Tech Program.

Open Electives offered by any Department/School of the University are listed in the Course Structure under the Open Elective category and offered to students of any Department including the parent Department/ School.

The Course details and method of evaluation shall be clearly prescribed in the concerned Course Handout.

2.11 **Specific Regulations regarding Assessment and Evaluation (Refer clause 8.5 to 8.8 of the Academic Regulations, 2019)**

The components of continuous assessments, weightage for each component and the method of evaluation shall be assigned considering the nature of the Courses in terms of the pedagogy and outcomes.

2.11.1 Normally, for the Courses that have only the Lecture and Tutorial or Lecture Credit Structure (L – T – 0) or (L – 0 – 0), with no Practical component, the components of Continuous Assessment and the distribution of weightage among the components of continuous assessment and duration of the
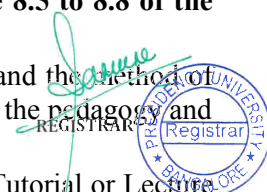
examination/assessment shall be as detailed in Table 2 below:

	Table 2. Method of Assessment for Courses with Credit Structures L–T–0 and L–0–0		
S. No.	**Components of Continuous Assessment**	**Weightage (% of Total Marks)**	**Duration of Assessment**
1	Mid Term*	30%	90 Minutes
2	Continuous Assessment 3: This component of Continuous Assessment shall consist of at least two (02) of the following: (1) Assignment(s), (2) Quiz, (3) Technical Seminar/Report, (4) Attendance/Class participation, (5) Assessment on the self-learning topic(s), or, (6) Any other type of assessment as prescribed in the concerned Course Handout.	20%	NA
3	End Term Final Examination	50%	3 hours
	Total	**100%**	
	Note: *Applicable from the Academic Year 2022-2023 onwards		

2.11.2   Normally, for Laboratory/Practice Based Courses with a Credit Structure of (0 – 0 – P), or (L – 0 – P), the components of Continuous Assessment and the distribution of weightage among the components of Continuous Assessment and duration of the examination/assessment shall be as detailed in Table 3 below:

	Table 3. Method of Assessment for Practical Courses with Credit Structures 0–0–P and L–0–P		
S. No.	**Components of Continuous Assessments**	**Weightage (% of Total Marks)**	**Duration of Assessment**
1	Continuous Assessment 1: Laboratory Work/Practical exercises, conducted in every Laboratory/Practice session/activity, including Laboratory records, practice/project reports, attendance/class participation as	30%	NA

	applicable, and as prescribed by the Course Handout.		
2	Continuous Assessment 2: Practical Test/Viva-Voce/Quiz/Practice Assignments/Presentations and other assessments as prescribed in the Course Handout.	20%	NA
3	End Term Practical Examination: Practical Experiment/Practice Test(s) with Viva-Voce, Jury or any other type of assessment as prescribed in the Course Handout.	50%	2 or 3 hours
Total		**100%**	

2.11.3 Normally, for Practice/Skill based Courses, without a defined credit structure (L – T – P), but with assigned Credits, (as defined in Clause 5.2 of the Academic Regulations, 2019), the method of evaluation shall be based only on Continuous Assessments. The various components of Continuous Assessments, the distribution of weightage among such components, and the method of evaluation/assessment, shall be prescribed in the concerned Course Handout. There shall be no component of End Term Final Examinations for such Courses.

2.11.4 In case any exception is required for a particular Course, where the methods of assessment prescribed in the specific regulations mentioned above in Sub-Clauses 2.11.1, 2.11.2 and 2.11.3 are not suitable/ relevant for the assessing the performance in the concerned Course, the BOS shall recommend the appropriate method of assessment for approval of the Academic Council.

2.12 **Course Handout**

The Course Handout (Refer Clause 6.2 of the Academic Regulations, 2019) is a comprehensive document describing the Objectives/Outcomes of the Course, the detailed syllabus (with the prescribed Textbook(s) and Reference Material), the Lesson/Session-wise Plan, and all the relevant and necessary details regarding the pedagogy, expectation from the students regarding preparation, participation and self-learning, components of continuous assessment and respective weightage (in percentage (%) of the total marks of all components of assessment) given to the components, and the method of evaluation. The guidelines for preparation of the Course Handout, its approval and delivery are listed in the following Sub-Clauses:

2.12.1. The Course Handout will be prepared as per the Outcome Based Education Guidelines of the University.

2.12.2. Normally, the Course Handout is prepared by the Course Instructor(s) assigned to teach the Course. In cases of multiple sections of students registered for the same Course, an Instructor In-Charge, assigned by the DAC,

shall prepare the Course Handout in consultation with the other Course Instructors assigned to the concerned Course.

2.12.3. The DAC shall examine each Course Handout and arrange for necessary deliberations as required. On acceptance of the completeness and quality of the Course Handout, the DAC shall approve the Course Handout.

2.12.4. A consolidated printed/soft copy of the Booklet of all Course Handouts corresponding to the concerned Semester of a particular Program of Study shall be provided to every student concerned on the first day/Registration day of the concerned Semester.

2.12.5. The Course Handout Booklet is a very important guide for the students registered in the concerned course. The students are expected to use the Course Handout Booklet to prepare regularly and benefit from each session (Lecture/Tutorial/Practical) of the Course(s) and perform well in the Continuous Assessments and End Term Final Examinations, as applicable. Every student shall read and adhere to all the guidelines prescribed in the Course Handout Booklet.

2.13. Rules and Guidelines for Transfer of Credits from SWAYAM-NPTEL Courses

(Refer Section 18.0 of the Academic Regulations, 2019)

The provisions and rules pertaining to the transfer of credits through Massive Open Online Courses are outlined in Section 18.0 of the Academic Regulations, 2019.

With reference to Clause 18.2 of the Academic Regulations, the rules and guidelines for transfer of credits specifically from Study Webs of Active-Learning for Young Aspiring Minds-National Program on Technology Enhanced Learning (SWAYAM-NPTEL) are as stated in the following Sub-Clauses:

2.13.1. A student may complete SWAYAM-NPTEL courses and transfer equivalent credits to partially or fully complete the mandatory credit requirements of Discipline Elective Courses and/or the mandatory credit requirements of Open Elective Courses and/or the mandatory credit requirements of Management Sciences Courses as prescribed in the concerned B. Tech. Program Regulations and Curriculum. However, it is the sole responsibility of the student to complete the mandatory credit requirements of the Discipline Elective Courses, the Open Elective Courses and the Management Sciences Courses as prescribed by the Program Regulations and Curriculum of the concerned B. Tech. Program.

2.13.2. Approved SWAYAM-NPTEL Courses shall be included as annexes to the Program Regulations and Curriculum for the concerned B. Tech. Program and shall be announced through University Notifications to the students from time to time. A student shall only request for transfer of credits from such approved/notified SWAYAM-NPTEL Courses as published by the concerned Departments.

2.13.3. SWAYAM-NPTEL Courses are considered for transfer of credits only if the concerned student has successfully completed the SWAYAM-NPTEL Course(s) and obtained the SWAYAM-NPTEL Certificate to this effect.

2.13.4. A student cannot transfer credits from SWAYAM-NPTEL Courses to earn the mandatory credits assigned for any other type of Courses (other than Discipline, Open Elective Courses and Management Sciences Courses) as
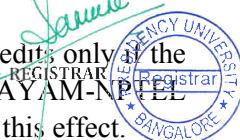
prescribed in the concerned Program Regulations and Curriculum. However, a student may complete SWAYAM-NPTEL Courses and transfer equivalent credits in excess of the required mandatory Credits (and Courses). In the case of such transfers beyond the mandatory Credits the transferred Credits will be included in the calculations of SGPA and CGPA.

2.13.5. Before the commencement of each Semester or during Pre-Registration schedule as per the Academic Calendar, Parent Departments may release a list of SWAYAM-NPTEL courses approved as Discipline Elective courses for each B. Tech. Program offered by them. In addition, Departments may also release a list of Open Elective courses offered for all B. Tech. Programs.

2.13.6. Students may Pre-Register for the approved SWAYAM-NPTEL Courses in the respective Departments and register for the SWAYAM-NPTEL Courses as per the schedule announced by SWAYAM-NPTEL.

2.13.7. The credit equivalence of the SWAYAM-NPTEL Courses are based on course durations and/or as recommended by SWAYAM-NPTEL. The Credit Equivalence mapped to SWAYAM-NPTEL course durations for transfer of credits is summarised in Table 4 below.

Table 4. SWAYAM-NPTEL Course Durations and Credit Equivalence		
S. No.	Course Duration	Credit Equivalence for Transfer of Credits
1	4 Weeks	1 Credit
2	8 Weeks	2 Credits
3	12 Weeks	3 Credits

2.13.8. A student who has successfully completed the approved SWAYAM-NPTEL Course(s) and wants to avail the provision of transfer of equivalent credits to fulfil (partially or fully) the mandatory credit requirements of the Discipline Electives and/or Open Electives and/or Management Sciences Courses as prescribed in the concerned Program Regulations and Curriculum, must submit the original SWAYAM-NPTEL Course Certificates to the Head of the Parent Department concerned, with a written request for the transfer of the equivalent credits. On verification of the SWAYAM-NPTEL Course Certificates and approval by the Head of the Department concerned, the SWAYAM-NPTEL Course(s) and equivalent Credits will be included in Course (with associated Credits) Registration of the concerned student in the Semester immediately following the completion of the SWAYAM-NPTEL Course(s).

2.13.9. The grading system for such SWAYAM-NPTEL Courses with transfer of credits is specified in Table 5 below.

Table 5. Grading System for SWAYAM-NPTEL Courses		
S. No.	Final Score on the SWAYAM-NPTEL Certificate	Grade Awarded
1	90% and above	O
2	From 80% to 89%	A+
3	From 70% to 79%	A
4	From 60% to 69%	B+
5	From 50% to 59%	B
6	From 40% to 49%	C

2.13.10. A student may submit a request for credit transfer from SWAYAM-NPTEL Courses before the last instruction day of the seventh (7th) Semester of the B. Tech. program as specified in the Academic Calendar. Requests for credit transfers shall not be permissible in the eighth (8th) semester.

2.13.11. The maximum permissible number of credits that a student may request for transfer in a Semester is ten (10) credits.

2.13.12. The University shall not reimburse any fees/expense, a student may incur for the SWAYAM-NPTEL Courses.

3.0   PART B: PROGRAM CURRICULUM

BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN ELECTRONICS AND COMMUNICATION ENGINEERING
B.Tech (Electronics and Communication Engineering), 2019-2023

The B.Tech (ECE) curriculum of Presidency University aims to impart high quality technical education by offering undergraduate, graduate and research programs in the domain of Electronics and Communication Engineering with exotic foundation in theory along with strong hands-on experience on software tools along with necessary skills for the students to become successful major contributors to society.

The curriculum of ECE is tailored to achieve the global and socio economical needs. Hence the degree focuses on creating suitable academic environment for students to get employment, or to

promote a good research attitude along with a strong entrepreneurial motivation. The degree also provides an engineer who can better understand the requirements of the society and which makes him\her to set some realistic goals to solve the problems which are existing.

Being in this decade of industrial revolution where technology is a key aspect for every role to be played, it demands a strong engineer who is equipped with all such capabilities to provide engineering solutions at the global level one should target at different areas of technological melioration. To achieve this the course like Mobile Communication, Embedded Systems, Wireless Communication, Information Theory and Coding, Antennas and Wave Propagation, VLSI design, Digital Communication, Digital Signal Processing, Microcontroller and Applications with core subjects of Electronics & Communication Engineering (ECE) are offered.

The courses offered provides a strong researcher, an ethical teacher, a valued professional who can relate and involve the ideas to up lift the society. It also promotes a life-long learning ability of the students.

Courses like Signals and Systems, MATLAB, Digital Signal Processing, Digital Image Processing is also being offered to let them know the realistic view of industrial environment promoting them employability readiness.

At this stage everyone targets at miniaturization, one should be equipped with the knowledge of basic concepts of chip design, hence PCB design, VLSI design, embedded system design, Microcontroller or a microprocessor requiring programming, a field programmable gate array (FPGA) coded in a hardware description language such Verilog or VHDL, software in C, assembly language, or other languages. So the B.Tech ECE curriculum of Presidency University caters the above mentioned courses.

Signal analysis is required in the field of healthcare hence the subjects like embedded systems, Image processing, control systems, biomedical Engineering is offered. Coming to defence part, the professional of this university should be equipped with the basic knowledge of communication systems. Hence courses like radar, speech processing, Digital communication, analog communication, control systems, image processing, mobile communication is being offered. The above mentioned courses are variegated across different fields. One such field to quote is entertainment.

Program Educational Objectives (PEOs)

The Electronics and Communication Engineering Graduates from Presidency University after 4 years of completion of the program shall:

PEO-1: Demonstrate as a successful ECE Professional with innovative skills and with a moral and ethical values.

PEO-2: Engage in life-long Learning through Research and Professional Development.

PEO-3: Serve as a leader in the profession through Consultancy and Entrepreneurship.

Program Outcomes (PO)
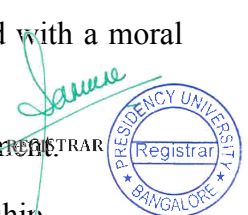
Graduates of the B. Tech. Program in Electronica and Communication Engineering will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.

PO2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and 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.

PO5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex 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 the professional engineering practice.

PO7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering 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.

PO12. Life-long learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

After the successful completion of the program, the graduate shall have:

PSO1: An ability to be a successful engineer by applying the knowledge of signal processing, embedded systems and antenna design.

PSO2: An ability to be a successful entrepreneur by understanding the impact of wireless communication, networking and provide solutions to real world problems related to global, environmental and socio-economic context.

PSO3: An ability to be a successful researcher by identifying, formulating and solving the security, Defence and VLSI Design related problems.

PSO4: An ability to identify, formulate and solve the communication engineering problems from knowledge gained during the course to work in a team as well as to lead a team.

Learning Objectives (LOs)

LO1. To develop problem solving skills and understanding of electronic circuits

LO2. To introduce students to the various processors available and program them to develop simple applications.

LO3. To impart understanding of the principles of communication systems, and develop requisite mathematical background through the knowledge of signal processing.

LO4. To impart understanding of the principles of electromagnetics theory and related fields.

LO5. To develop an expertise in the domain of electronics fabrication and manufacturing domains using VLSI and Microelectronics techniques.

LO6. To introduce the student community to the tasks involved in network security in data communication domains

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3.1 PROGRAM CURRICULUM

3.1.1 Mandatory Courses and Credits

The B.Tech (Electronics and Communication Engineering) program structure (2019-2023) consists of 61 courses totaling 180 credits.

Table 6 summarizes the type of Courses, number of Courses under each type and the associated credits that are mandatorily required for the completion of the Degree.

S. No	TYPE OF COURSES	NO. OF COURSES	CREDITS
	TABLE 6		
	B.Tech (Electronics and Communication Engineering) 2019-2023: Mandatory Courses and Credits		
1	Humanities (HS)	2	5
2	Management Sciences (MS)	2	6
3	Basic Sciences (BS)	9	29
4	Engineering Sciences (ES)	7	21
5	Core (Professional) Course (CC)	28	76
6	Discipline(Professional) Elective (DE)	6	16
7	Open Elective (OE)	3	9
8	Professional Practice (PP)	2	13
9	Personal and Professional Skills (PPS)	4	4
10	Social Immersion Course (SIC)	1	1
	TOTAL		**180**
	The mandatory minimum credits required for the award of the B.Tech (Electronics and Communication Engineering) Degree is 180 Credits		

The Table-3.1.1 is indicative of various components such as Foundation Courses (Basic Sciences, Engineering Sciences, Humanities, Social Sciences and Management Sciences), Professional Core, Discipline and Open Elective Courses. The unique feature of this Program is Professional Practice - I of 6-8 weeks during the end of 4th Semester and before the commencement of 5th Semester for the student to have industry exposure. The Professional Practice - II will be during their 7th / 8th Semester for about 15 weeks. Social Immersion Course, which is mandatory, is introduced in the curriculum for the student to give value of social service such as community service, clean and green, NSS, Protection of environment and health hazards, etc.

Table 6 lists the mandatory courses, type of courses, number of type of courses and the associated credits required for the completion of the B.Tech (Electronics and Communication Engineering) Program

B.Tech. (Electronics and Communication Engineering) Program Year Wise Structure

First Year			Second Year			Third Year			Fourth Year	
Sem. 1	Sem. 2		Sem.3	Sem. 4		Sem. 5	Sem. 6		Sem. 7	Sem. 8
BS-3	BS-4	Summer Term	BS-1	BS-1	Summer Term/PP –I-1	CC-5	CC-5	Summer Term	CC-4	PP-II-1
ES-4	ES-3		CC-7	CC-7		MS-1	MS-1		DE-1	
HS-1	HS-1		PPS-1	PPS-1		DE-2	DE-1		OE-1	
PPS-1	PPS-1					SIC-1	OE-1			

Mandatory Minimum Credits required for the award of the
B.Tech (Electronics and Communication Engineering)
Degree: 180

Nomenclature:

BS - Basic Sciences

ES - Engineering Sciences

HS – Humanities, Social Sciences and Management Sciences

CC - Core Course

DE - Discipline/Professional Electives

OE - Open Electives

PP-I/PP-II - Professional Practice

PPS-Personal and Professional Skills

SIC- Social Immersion Course

In the entire program, the practical and skill based course component contribute to an extent of approximately 30% out of the total credits of 180 for B.Tech (Electronics and Communication Engineering) program of four years duration.

3.1 PROGRAM STRUCTURE

			CREDIT STRUCTURE						
I SEM - PHYSICS CYCLE (Aug-Dec) *									
S. NO.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**TYPE OF SKILL**	**COURSE ADDRESSES TO**
			L	**T**	**P**	**CREDITS**			
1	MAT 105	Calculus and Linear Algebra	3	1	0	4	4	F[1]	-
2	PHY 101	Engineering Physics	4	0	0	4	4	F	-
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3	P[2]	-
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3	P	Env[4]
5	MEC 152	Engineering Graphics	2	0	4	4	6	P	-
6	ENG 1XX	Humanities-I	2	1	0	3	3	F/E[3]	-
7	PHY 151	Engineering Physics Lab	0	0	2	1	2	F	-
8	MEC 151	Workshop Practice	0	0	2	1	2	P	-
9	PPS 105	Building Self Confidence	0	0	2	1	2	E	-
		TOTAL	**17**	**2**	**10**	**24**	**29**		

[1] Foundation Course

[2] Professional Skills

[3] Employability Skills

[4] Environmental Issues

			CREDIT STRUCTURE						
I SEM - CHEMISTRY CYCLE (Aug-Dec)#									
S. NO.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**TYPE OF SKILL**	**COURSE ADDRESSES TO**
			L	**T**	**P**	**CREDITS**			
1	MAT 105	Calculus and Linear Algebra	3	1	0	4	4	F	-
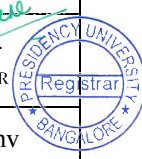
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			L	T	P				
2	CHE 101	Engineering Chemistry	4	0	0	4	4	F	-
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3	P	-
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3	P	-
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3	F	Env
6	ENG 1XX	Humanities-I	1	0	2	2	3	E	-
7	CSE 151	Computer Programming	2	0	4	4	6	E	-
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2	F	-
9	PPS 105	Building Self Confidence	0	0	2	1	2	F	PE[5]/S[6]
		TOTAL	**19**	**1**	**10**	**25**	**30**		

[5] Professional Ethics
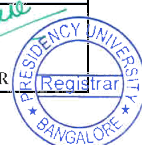
[6] Sustainability Issues

II SEM - CHEMISTRY CYCLE (Jan-May)*									
S. NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL	COURSE ADDRESSES TO
			L	T	P	CREDITS			
1	MAT 106	Calculus, Differential Equations and Complex Variables	3	1	0	4	4	F	-
2	CHE 101	Engineering Chemistry	4	0	0	4	4	F	-
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3	P	-
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3	P	-
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3	F	Env

6	ENG 1XX	Humanities-II	1	0	2	2	3	E	-
7	CSE 151	Computer Programming	2	0	4	4	6	E	-
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2	F	-
9	PPS 106	Effective Communication	0	0	2	1	2	F	PE/S
		TOTAL	**19**	**1**	**10**	**25**	**30**		

		II SEM - PHYSICS CYCLE (Jan-May)#							
S. NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS	TYPE OF SKILL	COURSE ADDRESSES TO
			L	T	P	CREDITS			
1	MAT 106	Calculus, Differential Equations and Complex Variables	3	1	0	4	4	F	-
2	PHY 101	Engineering Physics	4	0	0	4	4	F	-
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3	P	-
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3	P	Env
5	MEC 152	Engineering Graphics	2	0	4	4	6	P	-
6	ENG 1XX	Humanities-II	2	1	0	3	3	F/E	-
7	PHY 151	Engineering Physics Lab	0	0	2	1	2	F	-
8	MEC 151	Workshop Practice	0	0	2	1	2	P	-
9	PPS 106	Effective Communication	0	0	2	1	2	E	-
		TOTAL	**17**	**2**	**10**	**24**	**29**		

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Note: At the end of the 1st year (Common to all B. Tech. Programs) the total credits offered is 49.
The 1st year B.Tech Program structure is executed in two cycles.
* The students undergoing the "Physics" cycle shall take the Courses as indicated.

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS	Types of Skills	Course Addresses to
III SEMESTER									
1	MAT 107	Transform Techniques, Partial Differential Equations and Probability	3	1	0	4	4	F[5]	-
2	ECE 201	Analog Electronics	4	0	0	4	4	F[5]	-
3	ECE 202	Signals and Systems	3	1	0	4	4	F[5]	-
4	ECE 220	Digital Electronics	4	0	0	4	4	F[5]	-
5	EEE 219	Network Theory	3	0	0	3	3	F[5]	-
6	ECE 251	Analog Electronics Lab	0	0	2	1	2	F[5]	-
7	ECE 264	Digital Electronics Lab	0	0	2	1	2	F[5]	-
8	ECE 253	Signals and Systems Lab	0	0	2	1	2	F[5]	-
9	PPS 107	Design Thinking and Team Building	0	0	2	1	2	E[1]	-
		TOTAL	**17**	**2**	**8**	**23**	**27**		

Skills: E[1]: Employability skills, P[2]: Professional skills, E[3]: Entrepreneurship skills, R[4]:Research skills, F[5]: Fundamentals, K[6]:Knowledge Enhancement, S[7]: Social Responsibility

Course Addresses to G[1]:Gender Equality, S[2]:Sustainability, E[3]:Environmental Needs, E[4]:Ethics.

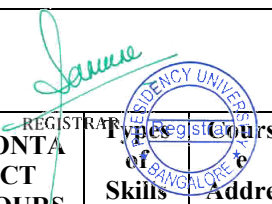| S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS	Types of Skills	Course Addresses to
IV SEMESTER									
1	MAT 108	Numerical Methods, Probability Distributions and Sampling Techniques	3	1	0	4	4	F[5]	-
2	EEE 204	Electromagnetic Theory	4	0	0	4	4		-
3	ECE 206	Linear Integrated Circuits	4	0	0	4	4	F	-
4	ECE 207	Microprocessor Programming and Interfacing	4	0	0	4	4	P[2]	
5	ECE 213	Digital Signal Processing	3	1	0	4	4	P[2]	-

6	ECE 254	Linear Integrated Circuits Lab	0	0	2	1	2	F^5	-
7	ECE 260	Digital Signal Processing Lab	0	0	2	1	2	P^2	-
8	ECE 256	Microprocessor Programming and Interfacing Lab	0	0	2	1	2	P^2	-
9	PPS 108	Being Corporate Ready	0	0	2	1	2	E^1	-
		TOTAL	**18**	**2**	**8**	**24**	**28**		

**NOTE: Students will undergo Professional Practice – I during the Summer Break between the fourth and the fifth semesters and the credits earned will be accounted for in the fifth semester.

V SEMESTER									
			CREDIT STRUCTURE				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
S. No	**COURSE CODE**	**COURSE NAME**	**L**	**T**	**P**	**CREDITS**			
1	EEE 205	Control Systems	3	1	0	4	4	P^2	-
2	ECE 210	Analog Communication	4	0	0	4	4	P^2	-
3	ECE 211	Transmission Lines and Waveguides	3	0	0	3	3	P^2	-
4	ECE 3XX	Discipline Elective – I	3	0	0	3	3	K^6	-
5	ECE 3XX	Discipline Elective – II	3	0	0	3	3	K^6	-
6	MGT 1XX	Management Sciences-I	3	0	0	3	3	E^3	-
7	ECE 265	Computer Aided Electronics Design Lab	0	0	2	1	2	P^2	-
8	ECE 258	Analog Communication Lab	0	0	2	1	2	P^2	-
9	SIC 501	Social Immersion Course*	0	0	0	1		S^7	E^4, G^1, E^3
10	PIP 101	Professional Practice – I **				5		P^2, E^1	
		TOTAL	**19**	**1**	**4**	**27/28**	**24**		

* Student has to register for Social Immersion Courses in any one semester 5 / 6 to earn the mandatory credits.

VI SEMESTER									
			CREDIT STRUCTURE				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
S.NO.	**COURSE CODE**	**COURSE NAME**	**L**	**T**	**P**	**CREDITS**			
1	ECE 212	Digital Communication	3	1	0	4	4	P^2	-

S.No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS	Types of Skills	Course Addresses to
2	ECE 215	VLSI Design	4	0	0	4	4	E^1, R^4	-
3	ECE 214	Antenna And Microwave Engineering	3	1	0	4	4	P^2	-
4	MGT 1XX	Management Sciences-II	3	0	0	3	3	E^3	-
5	ECE 3XX	Discipline Elective – III	3	0	0	3	3	K^6	-
6	ECE 259	Digital Communication Lab	0	0	2	1	2	P^2	-
7	ECE 262	VLSI Design Lab	0	0	2	1	2	E^1, R^4	-
8	SIC 501	Social Immersion Course*	0	0	0	1	-	S^7	E^4, G^1, E^3
9	XXX XXX	Open Elective I	3	0	0	3	3		-
		TOTAL	**19**	**2**	**4**	**23/24**	**25**		

	VII SEMESTER								
S. No	**COURSE CODE**	**COURSE NAME**	**L**	**T**	**P**	**CR EDI TS**	**CONT ACT HOUR S**	**Types of Skills**	**Cour se Addr esses to**
1	ECE 216	Information Theory and Coding	4	0	0	4	4	P^2	-
2	ECE 218	Micro Controller Applications	3	0	0	3	3	P^2, E^1	-
3	ECE 221	Data Communication and Networking	4	0	0	4	4	P^2, E^1	-
4	ECE 3XX	Discipline Elective – IV	3	0	0	3	3	K^6	-
5	XXX XXX	Open Elective-II	3	0	0	3	3	K^6	-
6	ECE 263	Micro Controller Applications Lab	0	0	2	1	2	P^2, E^1	-
		TOTAL	**17**	**0**	**2**	**18**	**19**		

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VIII SEMESTER

Table 1 is applicable to the the students who are pursuing various programs under various MOUs that the university has entered into, with foreign universities. Table 2 is applicable for other students and their credits are shown.

Sl. No.	Course Code	Course Name	Semester (to be offered)	Credits	L-T-P-C
Table 1: Applicable to students who have gone abroad under various MOUs					
1	PIP 102	Professional Practice - II	VIII	15	-

Sl. No.	Course Code	Course Name	Semester (to be offered)	Credits	L-T-P-C
Table 2: Applicable for other students					
1	XXX XXX	Open Elective – III	VIII	3	0-0-6-3
2	ECE XXX	Discipline Elective - V	VIII	2	2-0-0-2
3	ECE XXX	Discipline Elective - VI	VIII	2	2-0-0-2
4	PIP 103	Professional Practice – II	VIII	8	-
			Total	**15**	

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School of Engineering

Bachelor of Technology Degree

Program Regulations and Curriculum 2018-2022

B. Tech. (Electronics and Communication Engineering)

2018-2022

Regulation No.: PU/AC-11/8/06_2019

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Registrar

June 2019

Bachelor of Technology Degree
Program Regulations and Curriculum, 2018-2022

In exercise of the powers conferred by and in discharge of duties assigned under the relevant provision(s) of the Act, Statutes and Academic Regulations, 2017 of the University, the Academic Council hereby makes the following Regulations, namely;

Preliminary:

Short Title and Commencement

(f) These Regulations shall be called the **Bachelor of Technology Degree Program Regulations and Curriculum 2018-2022**.

(g) These Regulations are subject to, and, pursuant to the Academic Regulations, 2017

(h) These Regulations (with amendments) shall be applicable to the on going Bachelor of Technology Degree Programs of the 2018-2022 batch and to all other Bachelor of Technology Degree Programs which may be introduced in future.

(i) These Regulations (with amendments) shall supersede all the earlier Bachelor of Technology Degree Program Regulations and Curriculum, along with all the amendments thereto.

(j) These Regulations shall come into force with immediate effect

Definitions:

In these Regulations, unless the context otherwise requires:

y) *"Academic Council" means the Academic Council of the University;*

z) *"Academic Regulations" means the Academic Regulations, 2017 of the University;*

aa) *"Academic Term" means a Semester or Summer Term;*

bb) *"Act" means the Presidency University Act, 2013;*

cc) *"Board of Examinations (BOE)" means the Board of Examinations of the University;*

dd) *"Board of Management (BOM)" means the Board of Management of the University;*

ee) *"CGPA" means Cumulative Grade Point Average as defined in the Academic Regulations, 2017;*

ff) *"Clause" means the duly numbered Clause, with Sub-Clauses included, if any, of these Regulations;*

gg) *"Course" means, a specific subject usually identified by its Course Code and Course Name, with specified Credit Structure and Credits, Course Description/Content/ Syllabus, a set of textbooks/references, taught by assigned Course Instructor(s) to a specific class (group of students) during a specific Academic Term;*

hh) *"Course Instructor" means the faculty member who is the Teacher/Course Instructor for the concerned Course;*

ii) *"DAC" means, the Departmental Academic Committee;*

jj) *"Dean" means the Dean of the concerned School;*

kk) *"HOD" means the Head of the Concerned Department;*

ll) *"Parent Department" means the department that offers the Degree Program that a student undergoes;*

mm) *"Program" means the Bachelor of Technology (B.Tech) Degree Program;*

nn) *"Program Regulations" means the Bachelor of Technology Degree Program*

Regulations and Curriculum, 2018-2022;

oo) *"Registrar" means the Registrar of the University;*

pp) *"SGPA" means the Semester Grade Point Average as defined in the Academic Regulations, 2017;*

qq) *"School" means a constituent institution of the University established for monitoring, supervising and guiding, teaching, training and research activities in broadly related fields of studies;*

rr) *"Section" means the duly numbered Section, with Clauses included in that Section, of these Program Regulations;*

ss) *"Statutes" means the Statutes of Presidency University;*

tt) *"Sub-Clause" means the duly numbered Sub-Clause of these Program Regulations;*

uu) *"Summer Term" means an additional Academic Term conducted during the summer break (typically in June-July) for a duration of about eight (08) calendar weeks, with a minimum of thirty (30) University teaching days, and,*

vv) *"University" means Presidency University, Bengaluru;*

4.0 INTRODUCTION:

4.1 The **Academic Regulations, 2017** are applicable to all existing Degree Programs of the University. The Academic Regulations, and any amendments made therein, shall also be applicable to new Degree and Diploma Programs that may be offered by the University in future.

4.2 The **Bachelor of Technology Degree Program Regulations and Curriculum, 2018-2022** are subject to, and, pursuant to the Academic Regulations, 2017.

4.3 These Program Regulations shall be applicable to the following on going **Bachelor of Technology (B.Tech) Degree Programs of 2018-2022:**

4.3.1 Bachelor of Technology in Civil Engineering, abbreviated as B.Tech (Civil Engineering);

4.3.2 Bachelor of Technology in Computer Science and Engineering, abbreviated as B.Tech (Computer Science and Engineering);

4.3.3 Bachelor of Technology in Electronics and Communication Engineering, abbreviated as B.Tech (Electronics and Communication Engineering);

4.3.4 Bachelor of Technology in Electrical and Electronics Engineering, abbreviated as B.Tech (Electrical and Electronics Engineering);

4.3.5 Bachelor of Technology in Mechanical Engineering, abbreviated as B.Tech (Mechanical Engineering);

4.3.6 Bachelor of Technology in Petroleum Engineering, abbreviated as B.Tech (Petroleum Engineering);

4.3.7 Bachelor of Technology in Computer Engineering, abbreviated as B.Tech (Computer Engineering);

4.3.8 Bachelor of Technology in Computer and Communication Engineering, abbreviated as B.Tech. (Computer and Communication Engineering);
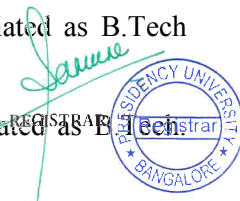
4.3.9   Bachelor of Technology in Information Science and Engineering, abbreviated as B.Tech. (Information Science and Engineering); and

4.3.10   Bachelor of Technology in Information Science and Technology, abbreviated as B.Tech. (Information Science and Technology).

4.4   These Program Regulations shall be applicable to other similar programs, which may be introduced in future.

4.5   These Program Regulations may evolve and get amended or modified or changed through appropriate approvals from the Academic Council, from time to time, and shall be binding on all concerned.

4.6   The effect of periodic amendments or changes in the Program Regulations, on the students admitted in earlier years, shall be dealt with appropriately and carefully, so as to ensure that those students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised Program Regulations, without any undue favour or considerations.

4.7   These Program Regulations are structured as follows:

4.7.1   **Part A:** Specific regulations relevant to the Bachelor of Technology (B.Tech) Degree Programs in pursuant of the provisions in Section 6.0 of the Academic Regulations, 2017 of the University.
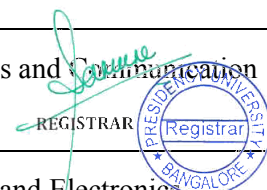
4.7.2   **Part B:** Program Curriculum for the specific on going Bachelor of Technology (B.Tech) Degree Program of study as enumerated and named in Clause 1.3.

5.0   PART A: PROGRAM SPECIFIC REGULATIONS

5.1   Program Description and Duration

B.Tech. Degree Programs are offered in the following branches/disciplines by the respective parent Departments as indicated in Table 2.1 below:

Table 2.1	
B. Tech Degree Programs and Respective Parent Departments	
B.Tech Program (Branch/Discipline)	***Parent Department***
B.Tech (Civil Engineering)	Department of Civil Engineering
B.Tech (Computer Science and Engineering)	Department of Computer Science and Engineering
B.Tech (Electronics and Communication Engineering)	Department of Electronics and Communication Engineering
B.Tech (Electrical and Electronics Engineering)	Department of Electrical and Electronics Engineering

| B.Tech (Mechanical Engineering)	Department of Mechanical Engineering
B.Tech (Petroleum Engineering)	Department of Petroleum Engineering
B.Tech (Computer Engineering)	Department of Computer Science and Engineering
B.Tech (Computer and Communication Engineering)	Department of Computer Science and Engineering
B.Tech (Information Science and Engineering)	Department of Computer Science and Engineering
B.Tech (Information Science and Technology)	Department of Computer Science and Engineering

5.2 Bachelor of Technology Degree Program is a Four-Year, Full-Time Semester based program. The minimum duration of the B.Tech Program is four (04) years and each year comprises of two academic Semesters (Odd and Even Semesters) and hence the duration of the B.Tech program is eight (08) Semesters.

5.3 **Admission Criteria to the Four-Year Bachelor of Technology (B.Tech) Degree Programs**
The University admissions shall be open to all persons irrespective of caste, class, creed, gender or nation. All admissions shall be made on the basis of merit in the qualifying examinations; Provided that forty percent of the admissions in all Programs of the University shall be reserved for the students of Karnataka State and admissions shall be made through a Common Entrance Examination conducted by the State Government or its agency and seats shall be allotted as per the merit and reservation policy of the State Government from time to time**.**

The admission criteria to the B.Tech Program are listed in the following Sub-Clauses:

5.3.1 An applicant who has successfully completed Pre-University course or Senior Secondary School Course (+2) or equivalent such as (11+1), 'A' level in Senior School Leaving Certificate Course from a recognized University of India or outside or from Senior Secondary Board or equivalent, constituted or recognized by the Union or by the State Government of that Country for the purpose of issue of qualifying certificate on successful completion of the course, may apply for and be admitted into the Program.

5.3.2 Provided further, the applicant must have taken Physics and Mathematics as compulsory subjects in the Pre-University/Higher Secondary / (10+2) / (11+1) examination, along with either Chemistry/ Biology/ Electronics/ Computer Science/ Biotechnology subject, and, the applicant must have obtained a minimum of 45% of the total marks (40% in case of candidates belonging to the Reserved Category as classified by the Government of Karnataka) in these subjects taken together.

5.3.3 The applicant must have appeared for Joint Entrance Examinations (JEE) Main / JEE (Advanced) / Karnataka CET / COMED-K, or any other State-level Engineering Entrance Examinations.

5.3.4 Reservation for the SC/ST and other backward classes shall be made in
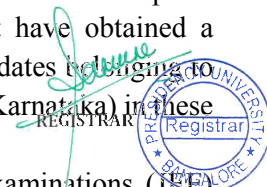
accordance with the directives issued by the Government of Karnataka from time to time.

5.3.5   Admissions are offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission, issued from time to time, by the Government of India.

5.3.6   Candidates must fulfil the medical standards required for admission as prescribed by the University.

5.3.7   If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation and any other falsification, the Registrar shall report the matter to the Board of Management (BOM), recommending revoking the admission of the candidate.

5.3.8   The decision of the BOM regarding the admissions is final and binding.

5.4   Lateral Entry

The University admits students directly to the second year (3rd Semester) of the B.Tech Degree Program as per the provisions and/or regulations of the Government of Karnataka pertaining to the "Lateral Entry" scheme announced by the Government from time to time.

Further, the general conditions and rules governing the provision of Lateral Entry to the B.Tech Program of the University are listed in the following Sub-Clauses:

5.4.1   Admission to 2nd year (3rd Semester) of the B.Tech Degree program shall be open to the candidates who are holders of a 3-year Diploma in Engineering (or equivalent qualification as recognized by the University), who have secured not less than forty five percentage (45%) marks in the final year examination (fifth and sixth Semesters of the Diploma Program) in the appropriate branch of Engineering. Provided that, in case of SC/ST and OBC candidates from Karnataka the minimum marks for eligibility shall be forty percent (40%).

5.4.2   Provided further that, candidates seeking Lateral Entry may be required to complete specified bridge Courses as prescribed by the University. Such bridge Courses, if any, shall not be included in the CGPA computations.

5.4.3   All the existing Regulations and Policies of the University shall be binding on all the students admitted to the Program through the provision of Lateral Entry.

5.4.4   The Course requirements prescribed for the 1st Year of the B.Tech Program shall be waived for the student(s) admitted through Lateral Entry and the duration of the B.Tech Program for such students is three (03) years, commencing from the 3rd Semester (commencement of the 2nd Year) of the B.Tech Program and culminating with the 8th Semester (end of the 4th Year) of the B.Tech Program.

5.4.5   The existing Program Regulations of the concerned Program to which the student is admitted through the provision of Lateral Entry shall be binding on the student with effect from the 3rd Semester of the Program. i.e. the Program Structure and Curriculum from the 3rd to 8th Semesters of the Program concerned shall be binding on the student admitted through Lateral Entry. Further, any revisions/amendments made to the Program Regulations thereafter, shall be binding on all the students of the concerned Program.

5.4.6   All the Courses (and the corresponding number of Credits) prescribed for the 1st Year of the concerned B.Tech Program shall be waived for the student(s) admitted to the concerned B.Tech Program through Lateral Entry. Further, the *Minimum Credit Requirements* for the award of the B.Tech Degree in the concerned Program shall be prescribed/calculated as follows:

The *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree prescribed by the concerned Bachelor of Technology Degree Program Regulations and Curriculum, 2018-2022, minus the number of Credits prescribed for the 1st Year (total number of Credits prescribed for the 1st and 2nd Semesters) of the B.Tech Program.

For instance, if the *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree as prescribed by the Regulations for B.Tech (Computer Science and Engineering) is "N" Credits, and, if the total credits prescribed in the 1st Year (total credits of the 1st and 2nd Semesters) of the Program concerned is "M" Credits, then the *Minimum Credit Requirements* for the award of the B.Tech in Computer Science and Engineering for a student who joins the Program through the provision of the Lateral Entry, shall be "N – M" Credits.

5.4.7   Further, no other waiver except the Courses prescribed for the 1st year of the B.Tech Program of the University shall be permissible for students joining the B.Tech Program through the provision of Lateral Entry.

5.5   **Transfer of student(s) from another recognized University to the 2nd year (3rd Semester) of the B.Tech Program of the University**

A student who has completed the 1st Year (i.e., passed in all the Courses/Subjects prescribed for the 1st Year) of the B.Tech / B.E. /B.S., Four-Year Degree Program from another recognized University, may be permitted to transfer to the 2nd Year (3rd Semester) of the B.Tech Program of the University as per the rules and guidelines prescribed in the following Sub-Clauses:

5.5.1   The concerned student fulfils the criteria specified in Sub-Clauses 2.3.1, 2.3.2 and 2.3.3.

5.5.2   The student shall submit the Application for Transfer along with a non-refundable Application Fee (as prescribed by the University from time to time) to the University no later than July 10 of the concerned year for admission to the 2nd Year (3rd Semester) B.Tech Program commencing on August 1 on the year concerned.

5.5.3   The student shall submit copies of the respective Marks Cards/ Grade Sheets/ Certificates along with the Application for Transfer.

5.5.4   The transfer may be provided on the condition that the Courses and Credits completed by the concerned student in the 1st Year of the B.Tech/B.E./B.S. Four Degree Program from the concerned University, are declared equivalent and acceptable by a Committee constituted by the Vice Chancellor for this purpose. Further, the Committee may also prescribe the Courses and Credits the concerned students shall have to mandatorily complete, if admitted to the 2nd Year of the B.Tech Program of the University.
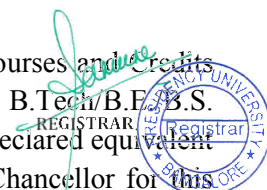
5.5.5 The Branch/Discipline allotted to the student concerned shall be the decision of the University and binding on the student.
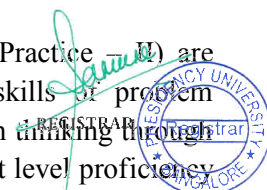
5.6 **Change of Branch/ Discipline**

A student admitted to a particular Branch of the B.Tech Program will normally continue studying in that Branch till the completion of the program. However, the University reserves the right to provide the option for a change of Branch, or not to provide the option for a change of Branch, at the end of 1st Year of the B.Tech Program to eligible students in accordance with the following rules and guidelines: framed by the University from time to time.

5.6.1 Normally, only those students, who have passed all the Courses prescribed for the 1st Year of the B.Tech Program and obtained a CGPA of not less than 6.00 at the end of the 2nd Semester, shall be eligible for consideration for a change of Branch.

5.6.2 Change of Branch, if provided, shall be made effective from the commencement of the 3rd Semester of the B.Tech Program. There shall be no provision for change of Branch thereafter under any circumstances whatsoever.

5.6.3 The student(s) provided with the change of Branch shall fully adhere to and comply with the Program Regulations of the concerned Branch of the B.Tech Program, the Fee Policy pertaining to that Branch of the B.Tech Program, and, all other rules pertaining to the changed Branch existing at the time.

5.6.4 Change of Branch once made shall be final and binding on the student. No student shall be permitted, under any circumstances, to refuse the change of Branch offered.

5.6.5 The eligible student may be allowed a change in Branch, strictly in order of *inter se* merit, subject to the conditions given below:

5.6.5.1 The actual number of students in the third Semester in any particular Branch to which the transfer is to be made, should not exceed the intake fixed by the University for the concerned Branch; and,

5.6.5.2 The actual number of students in any Branch from which transfer is being sought does not fall below 75% of the total intake fixed by the University for the concerned Branch.

5.6.6 The process of change of Branch shall be completed within the first five days of Registration for the 3rd Semester of the B.Tech Program.

5.7 **Professional Practice Courses**

Professional Practice Courses (Professional Practice – I and Professional Practice – II) are practice based Courses with the objective to equip students with the skills of problem identification, root cause analysis and problem solving, innovation and design thinking through industry exposure and project based learning. The expected outcomes are first level proficiency in problem solving and design thinking skills to better equip B.Tech graduates for their professional careers.

The method of evaluation and grading for the Professional Practice Courses shall be prescribed and approved by the concerned Departmental Academic Committee (refer Annexure A of the Academic Regulations, 2017). The same shall be prescribed in the Course Handout.

5.8 **Professional Practice – I**

Professional Practice – I is a 5 - Credit Course. This first level practice based course is conducted after the 4th Semester of the B.Tech Program, during the summer break (usually June – July), in accordance with the following options and guidelines:

5.8.1 *Internship Program in an Industry/ Company:*
A student may undergo an Internship Program for a period of 6 – 8 weeks in an Industry/ Company, subject to the following conditions:

5.8.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

5.8.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, and any other qualifying criteria) as applicable/ stipulated by the concerned Industry/ Company for award of the Internship to a student;

5.8.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of internships shall be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.8.1.2 above.

5.8.1.4 A student may opt for Internship in an Industry/Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

5.8.1.5 A student selected for an Internship in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

5.8.2 *Project Work:*
A student may opt to do a Project Work in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

5.8.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

5.8.2.2 The student may do the project work in an Industry/ Company/ Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.8.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the project work will be conducted in accordance with the Program Regulations and requirements of the University.
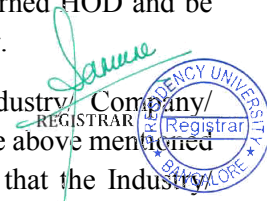
5.9   *Professional* **Practice – II**

Professional Practice - II is an intensive practice based course with 15 Credits offered during the final (4th) year of the B.Tech Program. Students may register for Professional Practice – II in either the 7th Semester or the 8th Semester of the B.Tech Program, in accordance with the following guidelines:

5.9.1   *Internship Program in an Industry/Company:*

A student may undergo an Internship Program for a period of about 15 weeks in an Industry/ Company, subject to the following conditions:

5.9.1.1   The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

5.9.1.2   The selection criteria (minimum CGPA, pass in all Courses as on date, any other qualifying criteria) as applicable/stipulated by the concerned Industry/ Company for award of Internship to a student;

5.9.1.3   The number of Internships available for the concerned Academic Term. Further, the available number of Internships will be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.9.1.2 above.

5.9.1.4   A student may opt for Internship in an Industry/Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

5.9.1.5   A student selected/ awarded an Internship Program in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

5.9.2   *Project Work and Dissertation:*

A student may do an extensive Project Work (with a Dissertation) in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

5.9.2.1   The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

5.9.2.2   The student may do the Project Work in an Industry/ Company/ Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.9.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the Project Work will be conducted in accordance with the Program Regulations and requirements of the University.

5.10   **University Learning Courses**

The objective of a University Learning Course (ULC) is to sensitize and inculcate commitment to social and environmental issues and make a contribution through service and experiential learning. The outcome is to produce graduates who are sensitized and committed to serving the social and environmental needs of society.

The ULC is a 1- Credit Course coordinated by the parent Department or a group of Departments and the student is required to complete this course ideally during any of the Semesters of the 2ⁿᵈ or 3ʳᵈ Year of the B.Tech Program. The nature and details of the ULC shall be approved by the concerned Departmental Academic Committee (DAC). As per the Academic Regulations, the 'S' grade is awarded for "satisfactory completion" of the Course and 'NC' grade is awarded for "non-completion" of the Course. The student who receives the "NC" grade shall repeat the ULC (it may be another type of ULC as approved by the concerned DAC) until the concerned student secures the "S" grade in the ULC. The "S" and "NC" grades do not carry grade points and hence not included in the SGPA, CGPA computations.

5.11 **Open Electives**

Open Electives are Courses offered by any Department/School of the University. The primary objective of offering Open Electives is to provide interdisciplinary/ transdisciplinary learning experiences. The outcome is a graduate with a fair exposure to disciplines beyond the chosen Branch in the B.Tech Program.

Open Electives offered by any Department/School of the University are listed in the Course Structure under the Open Elective category and offered to students of any Department including the parent Department/ School.

The Course details and method of evaluation shall be clearly prescribed in the concerned Course Handout.

5.12 **Specific Regulations regarding Assessment and Evaluation (Refer clause 8.5 to 8.8 of the Academic Regulations, 2017)**

The components of continuous assessments, weightage for each component and the method of evaluation shall be assigned considering the nature of the Courses in terms of the pedagogy and outcomes.

5.12.1 Normally, for the Courses that have only the Lecture and Tutorial or Lecture Credit Structure $(L – T – 0)$ or $(L – 0 – 0)$, with no Practical component, the components of Continuous Assessment and the distribution of weightage among the components of continuous assessment and duration of the examination/assessment shall be as detailed in Table 2.12.1 below:

Table 2.12.1 Method of Assessment for Courses with Credit Structure L –T – 0 and L –0 –0		
Components of Continuous Assessments	**Weightage (% of Total Marks)**	**Duration of Assessment**
1. Test 1	20%	1 hour
2. Test 2	20%	1 hour
3. This component of continuous assessment shall consist of at least TWO (02) of the following: (1) Assignment(s) (2) Quiz (3) Technical Seminar / Report (4) Attendance / Class participation (5) Assessment on self-learning topic(s),	20%	NA

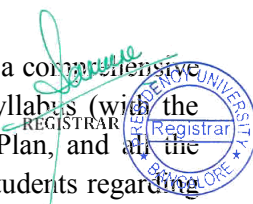|			
	or (6) Any other type of assessment as prescribed in the concerned Course Handout.		
4.	End Term Final Examinations	40%	2 or 3 hours
	Total	**100%**	
Note: An additional Test 3 may be conducted as an optional test to allow for improvement. If a Test 3 is provided, then the higher marks obtained in any two tests shall be considered for evaluation			

5.12.2 Normally, for Laboratory/Practice Based Courses with a Credit Structure of (0 – 0 – P), or (L – 0 – P), the components of Continuous Assessment and the distribution of weightage among the components of Continuous Assessment and duration of the examination/assessment shall be as detailed in Table 2.12.2 below:

Table 2.12.2 Method of Assessment for Practical Courses with Credit Structure 0 – 0 – P and L – 0 – P

Components of Continuous Assessments		Weightage (% of Total Marks)	Duration of Assessment
1.	Laboratory / Practical exercises, conducted in every Practical Class and Laboratory Records, Practical / Project Reports as prescribed by the Course Handout.	50%	NA
2.	Practical Test / Viva/ Quiz /Assignments as prescribed in the Course Handout.	20%	NA
3.	End Term Practical Examinations	30%	2 or 3 hours
	Total	**100%**	

5.12.3 Normally, for Practice/Skill based Courses, without a defined credit structure (L – T – P), but with assigned Credits, (as defined in Clause 5.2 of the Academic Regulations, 2017), the method of evaluation shall be based only on Continuous Assessments. The various components of Continuous Assessments, the distribution of weightage among such components, and the method of evaluation/assessment, shall be prescribed in the concerned Course Handout. There shall be no component of End Term Final Examinations for such Courses.

5.12.4 In case any exception is required for a particular Course, where the methods of assessment prescribed in the specific regulations mentioned above in Sub-Clauses 2.12.1, 2.12.2 and 2.12.3 are not suitable/ relevant for the assessing the performance in the concerned Course, the BOS shall recommend the appropriate method of assessment for approval of the Academic Council.

5.13 **Course Handout**

The Course Handout (Refer Clause 6.2 of the Academic Regulations, 2017) is a comprehensive document describing the Objectives/Outcomes of the Course, the detailed syllabus (with the prescribed Text Book(s) and Reference Material), the Lesson/Session-wise Plan, and all the relevant and necessary details regarding the pedagogy, expectation from the students regarding preparation, participation and self-learning, components of continuous assessment and respective weightage (in percentage (%) of the total marks of all components of assessment) given to the

components, and the method of evaluation. The guidelines for preparation of the Course Handout, its approval and delivery is listed in the following Sub-Clauses:

5.13.1 Normally the Course Handout is prepared by the Course Instructor(s) assigned to teach the Course. In cases of multiple sections of students registered for the same Course, an Instructor In-Charge, assigned by the DAC, shall prepare the Course Handout in consultation with the other Course Instructors assigned to the concerned Course.

5.13.2 The DAC shall examine each Course Handout and arrange for necessary deliberations as required. On acceptance of the completeness and quality of the Course Handout, the DAC shall approve the Course Handout.

5.13.3 A consolidated printed/soft copy of the Booklet of all Course Handouts corresponding to the concerned Semester of a particular Program of Study shall be provided to every student concerned on the first day/Registration day of the concerned Semester.

5.13.4 The Course Handout Booklet is a very important guide for the students registered in the concerned course. The students are expected to use the Course Handout Booklet to prepare regularly and benefit from each session (lecture/ tutorial/ practical) of the Course(s) and perform well in the continuous assessments and End Term Final Examination, as applicable. Every student shall read and adhere to all the guidelines prescribed in the Course Handout Booklet.

4.14. Rules and Guidelines for Transfer of Credits from SWAYAM-NPTEL Courses

(Refer Section 18.0 of the Academic Regulations.)

The provisions and rules pertaining to the transfer of credits are outlined in Section 18.0 of the Academic Regulations. The Rules and Guidelines for the transfer of credits specifically from the On-line Courses conducted by the Study Webs of Active-Learning for Young Aspiring Minds-National Program on Technology Enhanced Learning (SWAYAM-NPTEL) (Refer Sub-Clause 18.2 of the Academic Regulations) are as stated in the following Sub-Clauses:

4.14.1. A student may complete SWAYAM-NPTEL courses and transfer equivalent credits to partially or fully complete the mandatory credit requirements of Discipline Elective Courses and/or the mandatory credit requirements of Open Elective Courses as prescribed in the concerned B.Tech Program Regulations and Curriculum. However, it is the sole responsibility of the student to complete the mandatory credit requirements of the Discipline Elective Courses and the Open Elective Courses as prescribed by the Program Regulations and Curriculum of the concerned B.Tech Program.

4.14.2. Approved SWAYAM-NPTEL Courses shall be included as annexes to the Program Regulations and Curriculum for the concerned B.Tech Program and shall be announced through University Notifications to the students from time to time. A student shall only request for transfer of credits from such approved/notified SWAYAM-NPTEL Courses as published by the concerned
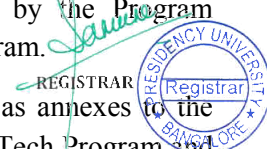
Departments.

4.14.3. SWAYAM-NPTEL Courses are considered for transfer of credits only if the concerned student has successfully completed the SWAYAM-NPTEL Course(s) and obtained the SWAYAM-NPTEL Certificate to this effect.

4.14.4. A student cannot transfer credits from SWAYAM-NPTEL Courses to earn the mandatory credits assigned for any other type of Courses (other than Discipline and Open Elective Courses) as prescribed in the concerned Program Regulations and Curriculum. However, a student may complete SWAYAM-NPTEL Courses and transfer equivalent credits in excess of the required mandatory credits (and Courses).

4.14.5. Before the commencement of each Semester or during Pre-Registration schedule as per the Academic Calendar, Parent Departments may release a list of SWAYAM-NPTEL courses approved as Discipline Elective courses for each B.Tech Program offered by them. In addition, Departments may also release a list of Open Elective courses for all B.Tech Programs.

4.14.6. Students may Pre-Register for the approved SWAYAM-NPTEL Courses in the respective Departments and register for the SWAYAM-NPTEL Courses as per the schedule announced by SWAYAM-NPTEL.

4.14.7. The credit equivalence of the SWAYAM-NPTEL Courses are based on course durations and/or as recommended by SWAYAM-NPTEL. The Credit Equivalence mapped to SWAYAM-NPTEL course durations for transfer of credits is summarised in Table 2.14.1.

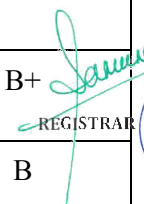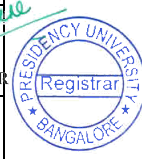| Table 2.14.1 SWAYAM-NPTEL Course Durations and Credit Equivalence		
Sl. No.	Course Duration	Credit Equivalence for Transfer of Credits
1	4 Weeks	1 Credit
2	8 Weeks	2 Credits
3	12 Weeks	3 Credits

4.14.8. A student who has successfully completed the approved SWAYAM-NPTEL Course(s) and wants to avail the provision of transfer of equivalent credits to

fulfill (partially or fully) the mandatory credit requirements of the Discipline Electives and/or Open Electives as prescribed in the concerned Program Regulations and Curriculum, must submit the original SWAYAM-NPTEL Course Certificates to the Head of the Parent Department concerned, with a written request for the transfer of the equivalent credits. On verification of the SWAYAM-NPTEL Course Certificates and approval by the Head of the Department concerned, the SWAYAM-NPTEL Course(s) and equivalent Credits will be included in Course (with associated Credits) Registration of the concerned student in the Semester immediately following the completion of the SWAYAM-NPTEL Course(s).

4.14.9. The grading system for such SWAYAM-NPTEL Courses with transfer of credits is specified in Table 2.14.2.

Table 2.14.2 Grading System for SWAYAM-NPTEL Courses		
Sl. No.	**Final Score on the SWAYAM-NPTEL Certificate**	**Grade Awarded**
1	90% and above	O
2	From 80% to 89%	A+
3	From 70% to 79%	A
4	From 60% to 69%	B+
5	From 50% to 59%	B
6	From 40% to 49%	C

4.14.10. A students may submit a request for credit transfer from SWAYAM-NPTEL Courses before the last instruction day of the seventh (7th) Semester of the B. Tech. program as specified in the Academic Calendar. Requests for credit transfers shall not be permissible in the eighth (8th) semester.

4.14.11. The maximum permissible number of credits that a student may request for transfer in a Semester is ten (10) credits.

4.14.12. The University shall not reimburse any fees/expense, a student may incur for the SWAYAM-NPTEL Courses.

REGISTRAR
Registrar
PRESIDENCY UNIVERSITY
BANGALORE

6.0   PART B:

BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN
ELECTRONICS AND COMMUNICATION ENGINEERING
B.Tech (Electronics and Communication Engineering), 2018-2022
PROGRAM CURRICULUM

6.1.1   Mandatory Courses and Credits

The B.Tech (Electronics and Communication Engineering) program structure (2018-2022) consists of 61 courses totaling 180 credits.

Table 3.1.1 summarizes the type of Courses, number of Courses under each type and the associated credits that are mandatorily required for the completion of the Degree.

TABLE 3.1.1 B.Tech (Electronics and Communication Engineering) 2018-2022: Mandatory Courses and Credits			
S. No	**TYPE OF COURSES**	**NO. OF COURSES**	**CREDITS**
1	Humanities, Social Sciences and Management Sciences(HS)	4	11
2	Basic Sciences (BS)	9	29
3	Engineering Sciences (ES)	7	21
4	Core (Professional) Course (CC)	28	76
5	Discipline(Professional) Elective (DE)	4	12
6	Open Elective (OE)	2	6
7	Professional Practice (PP) I and II	2	20
8	Personal and Professional Skills (PPS)	4	4
9	University Learning Courses (ULC)	1	1
TOTAL		**61**	**180**
The mandatory minimum credits required for the award of the B.Tech (Electronics and Communication Engineering) Degree is 180 Credits			

The Table-1 is indicative of various components such as Foundation Courses (Basic Sciences, Engineering Sciences, Humanities, Social Sciences and Management Sciences), Professional Core, Discipline and Open Elective Courses. The unique feature of this Program is Professional Practice - I of 6-8 weeks during the end of 4th Semester and before the commencement of 5th Semester for the student to have industry exposure. The Professional Practice - II will be during their 7th / 8th Semester for about 15 weeks. University Learning Course, which is mandatory, is introduced in the curriculum for the student to give value of social service such as community service, clean and green, NSS, Protection of environment and health hazards, etc.

Table-1 lists the mandatory courses, type of courses, number of type of courses and the associated credits required for the completion of the B.Tech (Electronics and Communication Engineering) Program

6.1.2 B.Tech. (Electronics and Communication Engineering) Program Year Wise Structure

First Year			Second Year			Third Year			Fourth Year	
Sem. 1	Sem. 2	Summer Term	Sem.3	Sem. 4	Summer Term/PP –I-1	Sem. 5	Sem. 6	Summer Term	Sem. 7	Sem. 8
BS-3	BS-4					CC-5	CC-5		CC-4	
ES-4	ES-3		BS-1	BS-1		HS-1	HS-1		DE-1	PP-II-1
HS-1	HS-1		CC-7	CC-7		DE-2	DE-1		OE-1	
PPS-1	PPS-1		PPS-1	PPS-1		ULC-1	OE-1			

Mandatory Minimum Credits required for the award of the
B.Tech (Electronics and Communication Engineering)
Degree: 180

Nomenclature:

BS - Basic Sciences

ES - Engineering Sciences

HS – Humanities, Social Sciences and Management Sciences

CC - Core Course

DE - Discipline/Professional Electives

OE - Open Electives

PP-I/PP-II - Professional Practice

PPS-Personal and Professional Skills

ULC - University Learning Course

In the entire program, the practical and skill based course component contribute to an extent of approximately 30% out of the total credits of 180 for B.Tech (Electronics and Communication Engineering) program of four years duration.

REGISTRAR

Preamble of the Department

The B.Tech (ECE) curriculum of Presidency University aims to impart high quality technical education by offering undergraduate, graduate and research programs in the domain of Electronics and Communication Engineering with exotic foundation in theory along with strong hands-on experience on software tools along with necessary skills for the students to become successful major contributors to society.

The curriculum of ECE is tailored to achieve the global and socio economical needs. Hence the degree focuses on creating suitable academic environment for students to get employment, or to promote a good research attitude along with a strong entrepreneurial motivation. The degree also provides an engineer who can better understand the requirements of the society and which makes him\her to set some realistic goals to solve the problems which are existing.

Being in this decade of industrial revolution where technology is a key aspect for every role to be played, it demands a strong engineer who is equipped with all such capabilities to provide engineering solutions at the global level one should target at different areas of technological melioration. To achieve this the course like Mobile Communication, Embedded Systems, Wireless Communication, Information Theory and Coding, Antennas and Wave Propagation, VLSI design, Digital Communication, Digital Signal Processing, Microcontroller and Applications with core subjects of Electronics & Communication Engineering (ECE) are offered.

The courses offered provides a strong researcher, an ethical teacher, a valued professional who can relate and involve the ideas to up lift the society. It also promotes a life-long learning ability of the students.

Courses like Signals and Systems, MATLAB, Digital Signal Processing, Digital Image Processing is also being offered to let them know the realistic view of industrial environment promoting them employability readiness.

At this stage everyone targets at miniaturization, one should be equipped with the knowledge of basic concepts of chip design, hence PCB design, VLSI design, embedded system design, Microcontroller or a microprocessor requiring programming, a field programmable gate array (FPGA) coded in a hardware description language such Verilog or VHDL, software in C, assembly language, or other languages. So the B.Tech ECE curriculum of Presidency University caters the above mentioned courses.

Signal analysis is required in the field of healthcare hence the subjects like embedded systems, Image processing, control systems, biomedical Engineering is offered. Coming to defence part, the professional of this university should be equipped with the basic knowledge of communication systems. Hence courses like radar, speech processing, Digital communication, analog communication, control systems, image processing, mobile communication is being offered. The above mentioned courses are variegated across different fields. One such field to quote is entertainment.

Learning Objectives of ECE Branch:

LO1. To develop problem solving skills and understanding of electronic circuits

LO2. To introduce students to the various processors available and program them to develop simple applications.

LO3. To impart understanding of the principles of communication systems, and develop requisite mathematical background through the knowledge of signal processing.

LO4. To impart understanding of the principles of electromagnetics theory and related fields.

LO5. To develop an expertise in the domain of electronics fabrication and manufacturing domains using VLSI and Microelectronics techniques.

LO6. To introduce the student community to the tasks involved in network security in data communication domains

Program Educational Objectives (PEOs)

The Electronics and Communication Engineering Graduates from Presidency University after 4 years of completion of the program shall:

PEO-1: Demonstrate as a successful ECE Professional with innovative skills and with a moral and ethical values.

PEO-2: Engage in life-long Learning through Research and Professional Development.

PEO-3: Serve as a leader in the profession through Consultancy and Entrepreneurship.

Program outcomes (POs)

Engineering Graduates should have:

a. An ability to apply knowledge of mathematics, science, and engineering

b. An ability to design and conduct experiments, as well as to analyze and interpret data

c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d. An ability to function on multidisciplinary teams

e. An ability to identify, formulate, and solve engineering problems

f. An understanding of professional and ethical responsibility

g. An ability to communicate effectively

h. An ability to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i. An ability to recognize the need for, and an ability to engage in life-long learning

j. An ability to acquire the knowledge of contemporary issues

k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

l. An ability to demonstrate management principles to manage projects and in multidisciplinary environments

m. An ability to engage in independent and lifelong learning in the broadest context of technological change

Program Specific Outcomes (PSOs)

After the successful completion of the program, the graduate shall have:

PSO1: An ability to be a successful engineer by applying the knowledge of signal processing, embedded systems and antenna design.

PSO2: An ability to be a successful entrepreneur by understanding the impact of wireless communication, networking and provide solutions to real world problems related to global, environmental and socio-economic context.

PSO3: An ability to be a successful researcher by identifying, formulating and solving the security, Defence and VLSI Design related problems.

PSO4: An ability to identify, formulate and solve the communication engineering problems from knowledge gained during the course to work in a team as well as to lead a team.

Value Added Courses:

We provide Value added courses for our students:

a. External Aptitude Training for Placements (Fully Paid by University)
b. Yoga Classes (Yoga Sessions held daily in campus and Yoga classes once a week)
c. Physiotherapy Sessions
d. Orientation to Basic Computer Based Office Softwares like Excel.

REGISTRAR
Registrar

6.2 PROGRAM STRUCTURE

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
		I Sem- PHYSICS CYCLE (Aug-Dec)*					
			CREDIT STRUCTURE				**CONTACT HOURS**
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	ENG 103	Technical Written Communication	2	1	0	3	3
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	MEC 151	Workshop Practice	0	0	2	1	2
9	PPS 105	Building Self Confidence	0	0	2	1	2
		TOTAL	**17**	**2**	**10**	**24**	**29**

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
		I Sem - CHEMISTRY CYCLE (Aug-Dec)#					
			CREDIT STRUCTURE				**CONTACT HOURS**
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
6	ENG 104	Technical Spoken Communication	1	0	2	2	3
7	CSE 151	Computer Programming	2	0	4	4	6
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
9	PPS 105	Building Self Confidence	0	0	2	1	2
		TOTAL	**19**	**1**	**10**	**25**	**30**

REGISTRAR

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
1	MAT 102	Engineering Mathematics – II	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
4	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
5	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
6	ENG 104	Technical Spoken Communication	1	0	2	2	3
7	CSE 151	Computer Programming	2	0	4	4	6
8	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
9	PPS 106	Effective Communication	0	0	2	1	2
		TOTAL	**19**	**1**	**10**	**25**	**30**

II Sem -PHYSICS CYCLE (Jan-May) [#]

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
1	MAT 102	Engineering Mathematics – II	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
4	CIV 101	Elements of Civil Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	ENG 103	Technical Written Communication	2	1	0	3	3
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	MEC 151	Workshop Practice	0	0	2	1	2
9	PPS 106	Effective Communication	0	0	2	1	2
		TOTAL	**17**	**2**	**10**	**24**	**29**

Note: At the end of the 1st year (Common to all B.Tech. Program) the total credits offered is 49.

The 1st year B.Tech. Program structure is executed in two cycles.

* The students undergoing the "Physics" cycle shall take the courses as indicated.

[#] The students undergoing the "Chemistry" cycle shall take the courses as indicated.

III SEMESTER

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS	Types of Skills	Course Addresses to
1	MAT 103	Engineering Mathematics– III	3	1	0	4	4	F[5]	-

2	ECE 201	Analog Electronics	4	0	0	4	4	F[5]	-
3	ECE 202	Signals and Systems	3	1	0	4	4	F[5]	-
4	ECE 220	Digital Electronics	4	0	0	4	4	F[5]	-
5	EEE 219	Network Theory	3	0	0	3	3	F[5]	-
6	ECE 251	Analog Electronics Lab	0	0	2	1	2	F[5]	-
7	ECE 264	Digital Electronics Lab	0	0	2	1	2	F[5]	-
8	ECE 253	Signals and Systems Lab with MATLAB	0	0	2	1	2	F[5]	-
9	PPS 107	Design Thinking and Team Building	0	0	2	1	2	E[1]	-
		TOTAL	17	2	8	23	27		

Skills: E[1]: Employability skills, P[2]: Professional skills, E[3]: Entrepreneurship skills, R[4]:Research skills, F[5]: Fundamentals, K[6]:Knowledge Enhancement, S[7]: Social Responsibility

Course Addresses to G[1]:Gender Equality, S[2]:Sustainability, E[3]:Environmental Needs, E[4]:Ethics.

IV SEMESTER									
S. No	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
			L	**T**	**P**	**CREDITS**			
1	MAT 104	Engineering Mathematics – IV	3	1	0	4	4	F[5]	-
2	EEE 204	Electromagnetic Theory	4	0	0	4	4	F[5]	-
3	ECE 206	Linear Integrated Circuits	4	0	0	4	4	F[5]	-
4	ECE 207	Microprocessor Programming and Interfacing	4	0	0	4	4	P[2]	-
5	ECE 213	Digital Signal Processing	3	1	0	4	4	P[2]	-
6	ECE 254	Linear Integrated Circuits Lab	0	0	2	1	2	F[5]	-
7	ECE 260	Digital Signal Processing Lab	0	0	2	1	2	P[2]	-
8	ECE 256	Microprocessor Programming and Interfacing Lab	0	0	2	1	2	P[2]	-
9	PPS 108	Being Corporate Ready	0	0	2	1	2	E[1]	-
		TOTAL	18	2	8	24	28		

**NOTE: Students will undergo Professional Practice – I during the Summer Break between the fourth and the fifth semesters and the credits earned will be accounted for in the fifth semester.

		V SEMESTER							
S. No	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
			L	**T**	**P**	**CREDITS**			
1	EEE 205	Control Systems	3	1	0	4	4	P^2	-
2	ECE 210	Analog Communication	4	0	0	4	4	P^2	-
3	ECE 211	Transmission Lines and Waveguides	3	0	0	3	3	P^2	-
4	ECE 3XX	Discipline Elective – I	3	0	0	3	3	K^6	-
5	ECE 3XX	Discipline Elective – II	3	0	0	3	3	K^6	-
6	MGT 112/ MGT 113	Engineering Economics/ Digital Entrepreneurship	3	0	0	3	3	E^3	-
7	ECE 265	Computer Aided Electronics Design Lab	0	0	2	1	2	P^2	-
8	ECE 258	Analog Communication Lab	0	0	2	1	2	P^2	-
9	SIC 501	Social Immersion Course*	0	0	0	1		S^7	E^4, G^1, E^3
10	PIP 101	Professional Practice – I **				5		P^2, E^1	
		TOTAL	19	1	4	27/28	24		

* Student has to register for Social Immersion Courses in any one semester 5 / 6 to earn the mandatory credits.

		VI SEMESTER							
S.NO.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
			L	**T**	**P**	**CREDITS**			
1	ECE 212	Digital Communication	3	1	0	4	4	P^2	-
2	ECE 215	VLSI Design	4	0	0	4	4	E^1, R^4	-
3	ECE 214	Antenna And Microwave Engineering	3	1	0	4	4	P^2	-
4	MGT 113/ MGT 112	Digital Entrepreneurship / Engineering Economics	3	0	0	3	3	E^3	-
5	ECE 3XX	Discipline Elective – III	3	0	0	3	3	K^6	-
6	ECE 259	Digital Communication Lab	0	0	2	1	2	P^2	-
7	ECE 262	VLSI Design Lab	0	0	2	1	2	E^1, R^4	-

8	SIC 501	Social Immersion Course*	0	0	0	1	-	S^7	E^4, G^1, E^3
9	XXX XXX	Open Elective I	3	0	0	3	3		-
		TOTAL	19	2	4	23/24	25		

		VII SEMESTER							
S. No	**COURSE CODE**	**COURSE NAME**	CREDIT STRUCTURE				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
			L	**T**	**P**	**CREDITS**			
1	ECE 216	Information Theory and Coding	4	0	0	4	4	P^2	-
2	ECE 218	Micro Controller Applications	3	0	0	3	3	P^2, E^1	-
3	ECE 221	Data Communication and Networking	4	0	0	4	4	P^2, E^1	-
4	ECE 3XX	Discipline Elective – IV	3	0	0	3	3	K^6	-
5	XXX XXX	Open Elective-II	3	0	0	3	3	K^6	-
6	ECE 263	Micro Controller Applications Lab	0	0	2	1	2	P^2, E^1	-
		TOTAL	17	0	2	18	19		

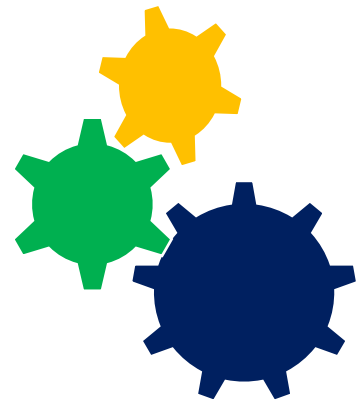|		**VIII SEMESTER**							
S. No	**COURSE CODE**	**COURSE NAME**	CREDIT STRUCTURE				**CONTACT HOURS**	**Types of Skills**	**Course Addresses to**
			L	**T**	**P**	**CREDITS**			
1	PIP 102	Professional Practice – II	-	-	-	15		P^2, E^1	-
		TOTAL	0	0	0	15	0		

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

School of Engineering

Bachelor of Technology Degree
Program Regulations and Curriculum, 2017-2021
B.Tech. (Electronics and Communication Engineering)
2017-2021

(As amended up to the 11th Meeting of the Academic Council held on June, 2019)

Regulations No.:

June, 2019

Bachelor of Technology Degree
Program Regulations and Curriculum, 2017-2021
((As amended up to the 11th Meeting of the Academic Council held on June, 2019)

In exercise of the powers conferred by and in discharge of duties assigned under the relevant provision(s) of the Act, Statutes and Academic Regulations, 2017 of the University, the Academic Council hereby makes the following Regulations, namely;

Preliminary:

Short Title and Commencement

(a) These Regulations shall be called the **Bachelor of Technology Degree Program Regulations and Curriculum, 2017-2021**.

(b) These Regulations are subject to, and, pursuant to the Academic Regulations, 2017.

(c) These Regulations (with amendments) shall be applicable to all on going Bachelor of Technology Degree Programs of the 2017-2021 Batch.

(d) These Regulations (with amendments) shall supersede all the earlier Bachelor of Technology Degree Program Regulations and Curriculum**,** along with all the amendments thereto.

(e) These Regulations shall come into force with immediate effect

Definitions:

In these Regulations, unless the context otherwise requires:

ww) *"Academic Council" means the Academic Council of the University;*

xx) *"Academic Regulations" means the Academic Regulations, 2017 of the University;*

yy) *"Academic Term" means a Semester or Summer Term;*

zz) *"Act" means the Presidency University Act, 2013;*

aaa) *"Board of Examinations (BOE)" means the Board of Examinations of the University;*

bbb) *"Board of Management (BOM)" means the Board of Management of the University;*

ccc) *"CGPA" means Cumulative Grade Point Average as defined in the Academic Regulations, 2017;*

ddd) *"Clause" means the duly numbered Clause, with Sub-Clauses included, if any, of these Regulations;*

eee) *"Course" means, a specific subject usually identified by its Course Code and Course Name, with specified Credit Structure and Credits, Course Description/Content/ Syllabus, a set of textbooks/references, taught by assigned Course Instructor(s) to a specific class (group of students) during a specific Academic Term;*

fff) *"Course Instructor" means the faculty member who is the Teacher/Course Instructor for the concerned Course;*

ggg) *"DAC" means, the Departmental Academic Committee;*

hhh) *"Dean" means the Dean of the concerned School;*

iii) *"HOD" means the Head of the Concerned Department;*

jjj) *"Parent Department" means the department that offers the Degree Program that a student undergoes;*

kkk)   "Program" means the Bachelor of Technology (B.Tech) Degree Program;

lll) "Program Regulations" means the Bachelor of Technology Degree Program Regulations and Curriculum, 2017-2021;

mmm)   "Registrar" means the Registrar of the University;

nnn)   "SGPA" means the Semester Grade Point Average as defined in the Academic Regulations, 2017;

ooo)   "School" means a constituent institution of the University established for monitoring, supervising and guiding, teaching, training and research activities in broadly related fields of studies;

ppp)   "Section" means the duly numbered Section, with Clauses included in that Section, of these Program Regulations;

qqq)   "Statutes" means the Statutes of Presidency University;

rrr) "Sub-Clause" means the duly numbered Sub-Clause of these Program Regulations;

sss) "Summer Term" means an additional Academic Term conducted during the summer break (typically in June-July) for a duration of about eight (08) calendar weeks, with a minimum of thirty (30) University teaching days, and,

ttt) "University" means Presidency University, Bengaluru;

7.0   INTRODUCTION:

7.1   The **Academic Regulations, 2017** are applicable to all existing Degree Programs of the University. The Academic Regulations, and any amendments made therein, shall also be applicable to new Degree and Diploma Programs that may be offered by the University in future.

7.2   The **Bachelor of Technology Degree Program Regulations and Curriculum, 2017-2021** are subject to, and, pursuant to the Academic Regulations, 2017.

7.3   These Program Regulations shall be applicable to the following on going **Bachelor of Technology (B.Tech) Degree Programs of 2017-2021:**

      7.3.1   Bachelor of Technology in Civil Engineering, abbreviated as B.Tech (Civil Engineering);

      7.3.2   Bachelor of Technology in Computer Science and Engineering, abbreviated as B.Tech (Computer Science and Engineering);

      7.3.3   Bachelor of Technology in Electronics and Communication Engineering, abbreviated as B.Tech (Electronics and Communication Engineering);

      7.3.4   Bachelor of Technology in Electrical and Electronics Engineering, abbreviated as B.Tech (Electrical and Electronics Engineering);

      7.3.5   Bachelor of Technology in Mechanical Engineering, abbreviated as B.Tech (Mechanical Engineering);

      7.3.6   Bachelor of Technology in Petroleum Engineering, abbreviated as B.Tech (Petroleum Engineering);

7.4   These Program Regulations shall be applicable to other similar programs, which may be introduced in future.

7.5   These Program Regulations may evolve and get amended or modified or changed through

appropriate approvals from the Academic Council, from time to time, and shall be binding on all concerned.

7.6   The effect of periodic amendments or changes in the Program Regulations, on the students admitted in earlier years, shall be dealt with appropriately and carefully, so as to ensure that those students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised Program Regulations, without any undue favour or considerations.

7.7   These Program Regulations are structured as follows:

7.7.1   **Part A:** Specific regulations relevant to the Bachelor of Technology (B.Tech) Degree Programs in pursuant of the provisions in Section 6.0 of the Academic Regulations, 2017 of the University.

7.7.2   **Part B:** Program Curriculum for the specific on going Bachelor of Technology (B.Tech) Degree Program of study as enumerated and named in Clause 1.3.

8.0   PART A: PROGRAM SPECIFIC REGULATIONS

8.1   **Program Description and Duration**
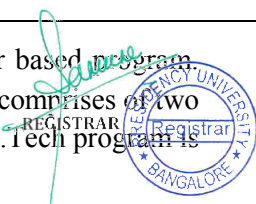B.Tech. Degree Programs are offered in the following branches/ disciplines by the respective parent Departments as indicated in Table 2.1 below:

<table>
<tr><td colspan="2" align="center">**Table 2.1**
B. Tech Degree Programs and Respective Parent Departments</td></tr>
<tr><td align="center">*B.Tech Program (Branch/Discipline)*</td><td align="center">*Parent Department*</td></tr>
<tr><td>B.Tech (Civil Engineering)</td><td>Department of Civil Engineering</td></tr>
<tr><td>B.Tech (Computer Science and Engineering)</td><td>Department of Computer Science and Engineering</td></tr>
<tr><td>B.Tech (Electronics and Communication Engineering)</td><td>Department of Electronics and Communication Engineering</td></tr>
<tr><td>B.Tech (Electrical and Electronics Engineering)</td><td>Department of Electrical and Electronics Engineering</td></tr>
<tr><td>B.Tech (Mechanical Engineering)</td><td>Department of Mechanical Engineering</td></tr>
<tr><td>B.Tech (Petroleum Engineering)</td><td>Department of Petroleum Engineering</td></tr>
</table>

8.2   Bachelor of Technology Degree Program is a Four-Year, Full-Time Semester based program. The minimum duration of the B.Tech Program is four (04) years and each year comprises of two academic Semesters (Odd and Even Semesters) and hence the duration of the B.Tech program is eight (08) Semesters.

8.3   **Admission Criteria to the Four-Year Bachelor of Technology (B.Tech) Degree Programs**
The University admissions shall be open to all persons irrespective of caste, class, creed, gender

or nation. All admissions shall be made on the basis of merit in the qualifying examinations; Provided that forty percent of the admissions in all Programs of the University shall be reserved for the students of Karnataka State and admissions shall be made through a Common Entrance Examination conducted by the State Government or its agency and seats shall be allotted as per the merit and reservation policy of the State Government from time to time.

The admission criteria to the B.Tech Program is listed in the following Sub-Clauses:

8.3.1 An applicant who has successfully completed Pre-University course or Senior Secondary School Course (+2) or equivalent such as (11+1), 'A' level in Senior School Leaving Certificate Course from a recognized University of India or outside or from Senior Secondary Board or equivalent, constituted or recognized by the Union or by the State Government of that Country for the purpose of issue of qualifying certificate on successful completion of the course, may apply for and be admitted into the Program.

8.3.2 Provided further, the applicant must have taken Physics and Mathematics as compulsory subjects in the Pre-University/ Higher Secondary / (10+2) / (11+1) examination, along with either Chemistry/ Biology/ Electronics/ Computer Science/ Biotechnology subject, and, the applicant must have obtained a minimum of 45% of the total marks (40% in case of candidates belonging to the Reserved Category as classified by the Government of Karnataka) in these subjects taken together.

8.3.3 The applicant must have appeared for Joint Entrance Examinations (JEE) Main / JEE (Advanced) / Karnataka CET / COMED-K, or any other State-level Engineering Entrance Examinations.

8.3.4 Reservation for the SC/ ST and other backward classes shall be made in accordance with the directives issued by the Government of Karnataka from time to time.

8.3.5 Admissions are offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission, issued from time to time, by the Government of India.

8.3.6 Candidates must fulfil the medical standards required for admission as prescribed by the University.

8.3.7 If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation and any other falsification, the Registrar shall report the matter to the Board of Management (BOM), recommending revoking the admission of the candidate.

8.3.8 The decision of the BOM regarding the admissions is final and binding.

8.4 **Lateral Entry**

The University admits students directly to the second year (3rd Semester) of the B.Tech Degree Program as per the provisions and/ or regulations of the Government of Karnataka pertaining to the "Lateral Entry" scheme announced by the Government from time to time.

Further, the general conditions and rules governing the provision of Lateral Entry to the B.Tech Program of the University are listed in the following Sub-Clauses:

8.4.1 Admission to 2nd year (3rd Semester) of the B.Tech Degree program shall be open to the candidates who are holders of a 3-year Diploma in Engineering (or equivalent qualification as recognized by the University), who have secured not less than forty five percentage (45%) marks in the final year examination
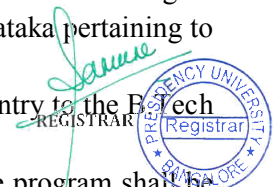
(fifth and sixth Semesters of the Diploma Program) in the appropriate branch of Engineering. Provided that, in case of SC/ ST and OBC candidates from Karnataka the minimum marks for eligibility shall be forty percent (40%).

8.4.2 Provided further that, candidates seeking Lateral Entry may be required to complete specified bridge Courses as prescribed by the University. Such bridge Courses, if any, shall not be included in the CGPA computations.

8.4.3 All the existing Regulations and Policies of the University shall be binding on all the students admitted to the Program through the provision of Lateral Entry.

8.4.4 The Course requirements prescribed for the 1st Year of the B.Tech Program shall be waived for the student(s) admitted through Lateral Entry and the duration of the B.Tech Program for such students is three (03) years, commencing from the 3rd Semester (commencement of the 2nd Year) of the B.Tech Program and culminating with the 8th Semester (end of the 4th Year) of the B.Tech Program.

8.4.5 The existing Program Regulations of the concerned Program to which the student is admitted through the provision of Lateral Entry shall be binding on the student with effect from the 3rd Semester of the Program. i.e., the Program Structure and Curriculum from the 3rd to 8th Semesters of the Program concerned shall be binding on the student admitted through Lateral Entry. Further, any revisions/ amendments made to the Program Regulations thereafter, shall be binding on all the students of the concerned Program.

8.4.6 All the Courses (and the corresponding number of Credits) prescribed for the 1st Year of the concerned B.Tech Program shall be waived for the student(s) admitted to the concerned B.Tech Program through Lateral Entry. Further, the *Minimum Credit Requirements* for the award of the B.Tech Degree in the concerned Program shall be prescribed/calculated as follows:

The *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree prescribed by the concerned Bachelor of Technology Degree Program Regulations and Curriculum, 2017-2021, minus the number of Credits prescribed for the 1st Year (total number of Credits prescribed for the 1st and 2nd Semesters) of the B.Tech Program.

For instance, if the *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree as prescribed by the Regulations for B.Tech (Computer Science and Engineering) is "N" Credits, and, if the total credits prescribed in the 1st Year (total credits of the 1st and 2nd Semesters) of the Program concerned is "M" Credits, then the *Minimum Credit Requirements* for the award of the B.Tech in Computer Science and Engineering for a student who joins the Program through the provision of the Lateral Entry, shall be "N – M" Credits.

8.4.7 Further, no other waiver except the Courses prescribed for the 1st year of the B.Tech Program of the University shall be permissible for students joining the B.Tech Program through the provision of Lateral Entry.

8.5 **Transfer of student(s) from another recognized University to the 2ⁿᵈ year (3ʳᵈ Semester) of the B.Tech Program of the University**

A student who has completed the 1ˢᵗ Year (i.e., passed in all the Courses/ Subjects prescribed for the 1ˢᵗ Year) of the B.Tech / B.E. / B.S., Four-Year Degree Program from another recognized University, may be permitted to transfer to the 2ⁿᵈ Year (3ʳᵈ Semester) of the B.Tech Program of the University as per the rules and guidelines prescribed in the following Sub-Clauses:

8.5.1 The concerned student fulfils the criteria specified in Sub-Clauses 2.3.1, 2.3.2 and 2.3.3.

8.5.2 The student shall submit the Application for Transfer along with a non-refundable Application Fee (as prescribed by the University from time to time) to the University no later than July 10 of the concerned year for admission to the 2ⁿᵈ Year (3ʳᵈ Semester) B.Tech Program commencing on August 1 on the year concerned.

8.5.3 The student shall submit copies of the respective Marks Cards/ Grade Sheets/ Certificates along with the Application for Transfer.

8.5.4 The transfer may be provided on the condition that the Courses and Credits completed by the concerned student in the 1ˢᵗ Year of the B.Tech/B.E./B.S. Four Degree Program from the concerned University, are declared equivalent and acceptable by a Committee constituted by the Vice Chancellor for this purpose. Further, the Committee may also prescribe the Courses and Credits the concerned students shall have to mandatorily complete, if admitted to the 2ⁿᵈ Year of the B.Tech Program of the University.

8.5.5 The Branch/ Discipline allotted to the student concerned shall be the decision of the University and binding on the student.

8.6 **Change of Branch/ Discipline**

A student admitted to a particular Branch of the B.Tech Program will normally continue studying in that Branch till the completion of the program. However, the University reserves the right to provide the option for a change of Branch, or not to provide the option for a change of Branch, at the end of 1ˢᵗ Year of the B.Tech Program to eligible students in accordance with the following rules and guidelines: framed by the University from time to time.

8.6.1 Normally, only those students, who have passed all the Courses prescribed for the 1ˢᵗ Year of the B.Tech Program and obtained a CGPA of not less than 6.00 at the end of the 2ⁿᵈ Semester, shall be eligible for consideration for a change of Branch.

8.6.2 Change of Branch, if provided, shall be made effective from the commencement of the 3ʳᵈ Semester of the B.Tech Program. There shall be no provision for change of Branch thereafter under any circumstances whatsoever.

8.6.3 The student(s) provided with the change of Branch shall fully adhere to and comply with the Program Regulations of the concerned Branch of the B.Tech Program, the Fee Policy pertaining to that Branch of the B.Tech Program, and all other rules pertaining to the changed Branch existing at the time.

8.6.4 Change of Branch once made shall be final and binding on the student. No student shall be permitted, under any circumstances, to refuse the change of Branch offered.

8.6.5 The eligible student may be allowed a change in Branch, strictly in order of *inter se* merit, subject to the conditions given below:

8.6.5.1 The actual number of students in the third Semester in any particular Branch to which the transfer is to be made, should not exceed the intake fixed by the University for the concerned Branch; and,

8.6.5.2 The actual number of students in any Branch from which transfer is being sought does not fall below 75% of the total intake fixed by the University for the concerned Branch.

8.6.6 The process of change of Branch shall be completed within the first five days of Registration for the 3rd Semester of the B.Tech Program.

8.7 Professional Practice Courses

Professional Practice Courses (Professional Practice – I and Professional Practice – II) are practice based Courses with the objective to equip students with the skills of problem identification, root cause analysis and problem solving, innovation and design thinking through industry exposure and project based learning. The expected outcomes are first level proficiency in problem solving and design thinking skills to better equip B.Tech graduates for their professional careers.

The method of evaluation and grading for the Professional Practice Courses shall be prescribed and approved by the concerned Departmental Academic Committee (refer Annexure A of the Academic Regulations, 2017). The same shall be prescribed in the Course Handout.

8.8 Professional Practice – I

Professional Practice – I is a 5-Credit Course. This first level practice based course is conducted after the 4th Semester of the B.Tech Program, during the summer break (usually June – July), in accordance with the following options and guidelines:

8.8.1 *Internship Program in an Industry/ Company:*
A student may undergo an Internship Program for a period of 6 – 8 weeks in an industry/ company, subject to the following conditions:

8.8.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

8.8.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, and any other qualifying criteria) as applicable/ stipulated by the concerned Industry/ Company for award of the Internship to a student;

8.8.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of internships shall be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.8.1.2 above.

8.8.1.4 A student may opt for Internship in an Industry/ Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/ Company offering such Internship conforms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.
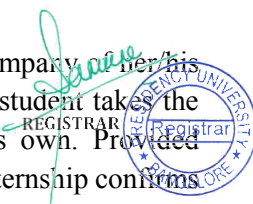
8.8.1.5 A student selected for an Internship in an industry/ company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

8.8.2 *Project Work:*
A student may opt to do a Project Work in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

8.8.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

8.8.2.2 The student may do the project work in an Industry/ Company/ Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.8.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the project work will be conducted in accordance with the Program Regulations and requirements of the University.

8.9 *Professional* **Practice – II**
Professional Practice - II is an intensive practice based course with 15 Credits offered during the final (4th) year of the B.Tech Program. Students may register for Professional Practice – II in either the 7th Semester or the 8th Semester of the B.Tech Program, in accordance with the following guidelines:

8.9.1 *Internship Program in an Industry/ Company:*
A student may undergo an Internship Program for a period of about 15 weeks in an Industry/ Company, subject to the following conditions:

8.9.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

8.9.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, any other qualifying criteria) as applicable/ stipulated by the concerned Industry/ Company for award of Internship to a student;

8.9.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of Internships will be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.9.1.2 above.

8.9.1.4 A student may opt for Internship in an Industry/ Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/ his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

8.9.1.5 A student selected/ awarded an Internship Program in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

8.9.2 *Project Work and Dissertation:*

A student may do an extensive Project Work (with a Dissertation) in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

8.9.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

8.9.2.2 The student may do the Project Work in an Industry/ Company/ Research Laboratory of her/ his choice subject to the above mentioned condition (Sub-Clause 2.9.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the Project Work will be conducted in accordance with the Program Regulations and requirements of the University.

8.10 University Learning Courses

The objective of a University Learning Course (ULC) is to sensitize and inculcate commitment to social and environmental issues and make a contribution through service and experiential learning. The outcome is to produce graduates who are sensitized and committed to serving the social and environmental needs of society.

The ULC is a 1- Credit Course coordinated by the parent Department or a group of Departments and the student is required to complete this course ideally during any of the Semesters of the 2nd or 3rd Year of the B.Tech Program. The nature and details of the ULC shall be approved by the concerned Departmental Academic Committee (DAC). As per the Academic Regulations, the 'S' grade is awarded for "satisfactory completion" of the Course and 'NC' grade is awarded for "non-completion" of the Course. The student who receives the "NC" grade shall repeat the ULC (it may be another type of ULC as approved by the concerned DAC) until the concerned student secures the "S" grade in the ULC. The "S" and "NC" grades do not carry grade points and hence not included in the SGPA, CGPA computations.

8.11 Open Electives

Open Electives are Courses offered by any Department/ School of the University. The primary objective of offering Open Electives is to provide interdisciplinary/ transdisciplinary learning experiences. The outcome is a graduate with a fair exposure to disciplines beyond the chosen Branch in the B.Tech Program.

Open Electives offered by any Department/ School of the University are listed in the Course Structure under the Open Elective category and offered to students of any Department including the parent Department/ School.

The Course details and method of evaluation shall be clearly prescribed in the concerned Course Handout.

8.12 Specific Regulations regarding Assessment and Evaluation (Refer clause 8.5 to 8.8 of the Academic Regulations, 2017)

The components of continuous assessments, weightage for each component and the method of evaluation shall be assigned considering the nature of the Courses in terms of the pedagogy and outcomes.

8.12.1 Normally, for the Courses that have only the Lecture and Tutorial or Lecture Credit Structure (L – T – 0)/ (L – 0 – 0) , with no Practical component, the components of Continuous Assessment and the distribution of weightage among the components of continuous assessment and duration of the examination/assessment shall be as detailed in Table 2.12.1 below:

<table>
<tr><td colspan="4" align="center">Table 2.12.1 Method of Assessment
for Courses with Credit Structure L –T – 0 and L –0 –0</td></tr>
<tr><td colspan="2" align="center">Components of Continuous Assessments</td><td align="center">Weightage (% of Total Marks)</td><td align="center">Duration of Assessment</td></tr>
<tr><td>1.</td><td>Test 1</td><td>20%</td><td>1 hour</td></tr>
<tr><td>2.</td><td>Test 2</td><td>20%</td><td>1 hour</td></tr>
<tr><td>3.</td><td>This component of continuous assessment shall consist of at least TWO (02) of the following:
(1) Assignment(s)
(2) Quiz
(3) Technical Seminar / Report
(4) Attendance / Class participation
(5) Assessment on self-learning topic(s), or
(6) Any other type of assessment as prescribed in the concerned Course Handout.</td><td>20%</td><td>NA</td></tr>
<tr><td>4.</td><td>End Term Final Examinations</td><td>40%</td><td>2 or 3 hours</td></tr>
<tr><td colspan="4">Note: An additional Test 3 may be conducted as an optional test to allow for improvement. If a Test 3 is provided, then the higher marks obtained in any two tests shall be considered for evaluation.</td></tr>
</table>

8.12.2 Normally, for Laboratory/Practice Based Courses with a Credit Structure of (0 – 0 – P), or (L – 0 – P), the components of Continuous Assessment and the distribution of weightage among the components of Continuous Assessment and duration of the examination/assessment shall be as detailed in Table 2.12.2 below:

<table>
<tr><td colspan="4" align="center">Table 2.12.2 Method of Assessment
for Practical Courses with Credit Structure
0 –0 – P and L – 0 – P</td></tr>
<tr><td colspan="2" align="center">Components of Continuous Assessments</td><td align="center">Weightage (% of Total Marks)</td><td align="center">Duration of Assessment</td></tr>
<tr><td>1.</td><td>Laboratory / Practical exercises, conducted in every Practical Class and Laboratory Records, Practical / Project Reports as prescribed by the Course Handout.</td><td>50%</td><td>NA</td></tr>
<tr><td>2.</td><td>Practical Test / Viva/ Quiz /Assignments as prescribed in the Course Handout.</td><td>20%</td><td>NA</td></tr>
<tr><td>3.</td><td>End Term Practical Examinations</td><td>30%</td><td>2 or 3 hours</td></tr>
<tr><td colspan="2" align="right">Total</td><td>100%</td><td></td></tr>
</table>

8.12.3 Normally, for Practice/Skill based Courses, without a defined credit structure (L – T – P), but with assigned Credits, (as defined in Clause 5.2 of the Academic Regulations, 2017), the method of evaluation shall be based only on Continuous Assessments. The various components of Continuous Assessments, the distribution of weightage among such components, and the method of evaluation/assessment, shall be prescribed in the concerned Course Handout. There shall be no component of End Term Final Examinations for such Courses.

8.12.4 In case any exception is required for a particular Course, where the methods of assessment prescribed in the specific regulations mentioned above in Sub-Clauses 2.12.1, 2.12.2 and 2.12.3 are not suitable/ relevant for the assessing the performance in the concerned Course, the BOS shall recommend the appropriate method of assessment for approval of the Academic Council.

8.13 Course Handout

The Course Handout (Refer Clause 6.2 of the Academic Regulations, 2017) is a comprehensive document describing the Objectives/ Outcomes of the Course, the detailed syllabus (with the prescribed Text Book(s) and Reference Material), the Lesson/Session-wise Plan, and all the relevant and necessary details regarding the pedagogy, expectation from the students regarding preparation, participation and self-learning, components of continuous assessment and respective weightage (in percentage (%) of the total marks of all components of assessment) given to the components, and the method of evaluation. The guidelines for preparation of the Course Handout, its approval and delivery is listed in the following Sub-Clauses:

8.13.1 Normally the Course Handout is prepared by the Course Instructor(s) assigned to teach the Course. In cases of multiple sections of students registered for the same Course, an Instructor In-Charge, assigned by the DAC, shall prepare the Course Handout in consultation with the other Course Instructors assigned to the concerned Course.

8.13.2 The DAC shall examine each Course Handout and arrange for necessary deliberations as required. On acceptance of the completeness and quality of the Course Handout, the DAC shall approve the Course Handout.

8.13.3 A consolidated printed/soft copy of the Booklet of all Course Handouts corresponding to the concerned Semester of a particular Program of Study shall be provided to every student concerned on the first day/ Registration day of the concerned Semester.

8.13.4 The Course Handout Booklet is a very important guide for the students registered in the concerned course. The students are expected to use the Course Handout Booklet to prepare regularly and benefit from each session (lecture/ tutorial/ practical) of the Course(s) and perform well in the continuous assessments and End Term Final Examination, as applicable. Every student shall read and adhere to all the guidelines prescribed in the Course Handout Booklet.

6.14. Rules and Guidelines for Transfer of Credits from SWAYAM-NPTEL Courses

(Refer Section 18.0 of the Academic Regulations.)

The provisions and rules pertaining to the transfer of credits are outlined in Section 18.0 of the Academic Regulations. The Rules and Guidelines for the transfer of credits specifically from the On-line Courses conducted by the Study Webs of Active-Learning for Young Aspiring Minds-National Program on Technology Enhanced Learning (SWAYAM-NPTEL) (Refer Sub-Clause 18.2 of the Academic Regulations) are as stated in the following Sub-Clauses:

6.14.1. A student may complete SWAYAM-NPTEL courses and transfer equivalent credits to partially or fully complete the mandatory credit requirements of Discipline Elective Courses and/or the mandatory credit requirements of Open Elective Courses as prescribed in the concerned B.Tech Program Regulations and Curriculum. However, it is the sole responsibility of the student to complete the mandatory credit requirements of the Discipline Elective Courses and the Open Elective Courses as prescribed by the Program Regulations and Curriculum of the concerned B.Tech Program.

6.14.2. Approved SWAYAM-NPTEL Courses shall be included as annexes to the Program Regulations and Curriculum for the concerned B.Tech Program and shall be announced through University Notifications to the students from time to time. A student shall only request for transfer of credits from such approved/notified SWAYAM-NPTEL Courses as published by the concerned Departments.

6.14.3. SWAYAM-NPTEL Courses are considered for transfer of credits only if the concerned student has successfully completed the SWAYAM-NPTEL Course(s) and obtained the SWAYAM-NPTEL Certificate to this effect.

6.14.4. A student cannot transfer credits from SWAYAM-NPTEL Courses to earn the mandatory credits assigned for any other type of Courses (other than Discipline and Open Elective Courses) as prescribed in the concerned Program Regulations and Curriculum. However, a student may complete SWAYAM-NPTEL Courses and transfer equivalent credits in excess of the required mandatory credits (and Courses).

6.14.5. Before the commencement of each Semester or during Pre-Registration schedule as per the Academic Calendar, Parent Departments may release a list of SWAYAM-NPTEL courses approved as Discipline Elective courses for each B.Tech Program offered by them. In addition, Departments may also release a list of Open Elective courses for all B.Tech Programs.

6.14.6. Students may Pre-Register for the approved SWAYAM-NPTEL Courses in the respective Departments and register for the SWAYAM-NPTEL Courses as per the schedule announced by SWAYAM-NPTEL.

6.14.7. The credit equivalence of the SWAYAM-NPTEL Courses are based on course durations and/or as recommended by SWAYAM-NPTEL. The Credit Equivalence mapped to SWAYAM-NPTEL course durations for transfer of credits is summarised in Table 2.14.1.

REGISTRAR

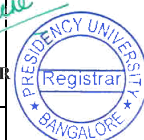| Table 2.14.1 SWAYAM-NPTEL Course Durations and Credit Equivalence		
Sl. No.	**Course Duration**	**Credit Equivalence for Transfer of Credits**
1	4 Weeks	1 Credit
2	8 Weeks	2 Credits
3	12 Weeks	3 Credits

6.14.8.   A student who has successfully completed the approved SWAYAM-NPTEL Course(s) and wants to avail the provision of transfer of equivalent credits to fulfill (partially or fully) the mandatory credit requirements of the Discipline Electives and/or Open Electives as prescribed in the concerned Program Regulations and Curriculum, must submit the original SWAYAM-NPTEL Course Certificates to the Head of the Parent Department concerned, with a written request for the transfer of the equivalent credits. On verification of the SWAYAM-NPTEL Course Certificates and approval by the Head of the Department concerned, the SWAYAM-NPTEL Course(s) and equivalent Credits will be included in Course (with associated Credits) Registration of the concerned student in the Semester immediately following the completion of the SWAYAM-NPTEL Course(s).

6.14.9.   The grading system for such SWAYAM-NPTEL Courses with transfer of credits is specified in Table 2.14.2.

Table 2.14.2 Grading System for SWAYAM-NPTEL Courses		
Sl. No.	**Final Score on the SWAYAM-NPTEL Certificate**	**Grade Awarded**
1	90% and above	O

	Table 2.14.2 Grading System for SWAYAM-NPTEL Courses	
Sl. No.	Final Score on the SWAYAM-NPTEL Certificate	Grade Awarded
2	From 80% to 89%	A+
3	From 70% to 79%	A
4	From 60% to 69%	B+
5	From 50% to 59%	B
6	From 40% to 49%	C

6.14.10. A students may submit a request for credit transfer from SWAYAM-NPTEL Courses before the last instruction day of the seventh (7th) Semester of the B. Tech. program as specified in the Academic Calendar. Requests for credit transfers shall not be permissible in the eighth (8th) semester.

6.14.11. The maximum permissible number of credits that a student may request for transfer in a Semester is ten (10) credits.

6.14.12. The University shall not reimburse any fees/expense, a student may incur for the SWAYAM-NPTEL Courses.

9.0 PART B:

BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN ELECTRONICS AND COMMUNICATION ENGINEERING
B.Tech (Electronics and Communication Engineering) Program, 2017-2021

9.1 PROGRAM CURRICULUM

9.1.1 Mandatory Courses and Credits

The B.Tech (Electronics and Communication Engineering) program structure (2017-2021) consists of 61 courses totaling 180 credits.

Table 3.1.1 summarizes the type of Courses, number of Courses under each type and the associated credits that are mandatorily required for the completion of the Degree.

TABLE 3.1.1			
B.Tech (Electronics and Communication Engineering) 2017-2021: Mandatory Courses and Credits			
S. No	**TYPE OF COURSES**	**NO. OF COURSES**	**CREDITS**
1	Humanities, Social Sciences and Management Sciences(HS)	4	11
2	Basic Sciences (BS)	9	29
3	Engineering Sciences (ES)	7	21
4	Core (Professional) Course (CC)	28	76
5	Discipline(Professional) Elective (DE)	4	12
6	Open Elective (OE)	2	6
7	Professional Practice (PP) I and II	2	20
8	Personal and Professional Skills (PPS)	4	4
9	University Learning Courses (ULC)	1	1
TOTAL		**61**	**180**
The mandatory minimum credits required for the award of the B.Tech (Electronics and Communication Engineering) Degree is 180 Credits			

The Table-1 is indicative of various components such as Foundation Courses (Basic Sciences, Engineering Sciences, Humanities, Social Sciences and Management Sciences), Professional Core, Discipline and Open Elective Courses. The unique feature of this Program is Professional Practice - I of 6-8 weeks during the end of 4th Semester and before the commencement of 5th Semester for the student to have industry exposure. The Professional Practice - II will be during their 7th / 8th Semester for about 15 weeks. University Learning Course, which is mandatory, is introduced in the curriculum for the student to give value of social service such as community service, clean and green, NSS, Protection of environment and health hazards, etc.

Table-1 lists the mandatory courses, type of courses, number of type of courses and the associated credits required for the completion of the B.Tech (Electronics and Communication Engineering) Program

REGISTRAR

9.1.2   B.Tech. (Electronics and Communication Engineering) Program Year Wise Structure

First Year		Summer Term	Second Year		Summer Term/PP –I-1	Third Year		Summer Term	Fourth Year	
Sem. 1	Sem. 2		Sem.3	Sem. 4		Sem. 5	Sem. 6		Sem. 7	Sem. 8
BS-3	BS-4					CC-5	CC-5			
ES-4	ES-3		BS-1	BS-1		HS-1	HS-1		CC-4	
HS-1	HS-1		CC-7	CC-7		DE-2	DE-1		DE-1	PP-II-1
PPS-1	PPS-1		PPS-1	PPS-1		ULC-1	OE-1		OE-1	

Mandatory Minimum Credits required for the award of the B.Tech (Electronics and Communication Engineering) Degree: 180

Nomenclature:

BS - Basic Sciences

ES - Engineering Sciences

HS – Humanities, Social Sciences and Management Sciences

CC - Core Course

DE - Discipline/ Professional Electives

OE - Open Electives

PP-I/ PP-II - Professional Practice

PPS-Personal and Professional Skills

ULC - University Learning Course

In the entire program, the practical and skill based course component contribute to an extent of approximately 30% out of the total credits of 180 for B.Tech (Electronics and Communication Engineering) program of four years duration.

9.2 PROGRAM STRUCTURE

I SEMESTER (PHYSICS CYCLE)*

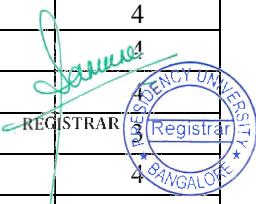| S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
			CREDIT STRUCTURE				
1	MAT 101	Engineering Mathematics - I	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
4	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
5	CSE 151	Computer Programming	2	0	4	4	6
6	MEC 151	Workshop Practice	0	0	2	1	2
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	ENG 101	English Communication: Written	3	0	0	3	3
9	PPS 101	Personal and Professional Skills-I	0	0	2	1	2
		TOTAL	**18**	**1**	**10**	**24**	**29**

I SEMESTER (CHEMISTRY CYCLE)#

S. No	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
			CREDIT STRUCTURE				
1	MAT 101	Engineering Mathematics – I	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	CIV 101	Elements of Civil Engineering	3	0	0	3	3
4	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
7	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
8	ENG 101	English Communication: Written	3	0	0	3	3
9	PPS 101	Personal and Professional Skills-I	0	0	2	1	2
		TOTAL	**21**	**1**	**8**	**26**	**30**

II SEMESTER (CHEMISTRY CYCLE)#

S. No		COURSE NAME	CREDIT STRUCTURE	

	COURSE CODE		L	T	P	CREDITS	CONTACT HOURS
1	MAT 102	Engineering Mathematics - II	3	1	0	4	4
2	CHE 101	Engineering Chemistry	4	0	0	4	4
3	CIV 101	Elements of Civil Engineering	3	0	0	3	3
4	ECE 101	Elements of Electronics Engineering	3	0	0	3	3
5	MEC 152	Engineering Graphics	2	0	4	4	6
6	CIV 102	Environmental Science and Disaster Management	3	0	0	3	3
7	CHE 151	Engineering Chemistry Lab	0	0	2	1	2
8	ENG 102	English Communication: Oral	1	0	2	2	3
9	PPS 102	Personal and Professional Skills-II	0	0	2	1	2
		TOTAL	19	1	10	25	30

II SEMESTER (PHYSICS CYCLE)*

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 102	Engineering Mathematics - II	3	1	0	4	4
2	PHY 101	Engineering Physics	4	0	0	4	4
3	MEC 101	Elements of Mechanical Engineering	3	0	0	3	3
4	EEE 101	Elements of Electrical Engineering	3	0	0	3	3
5	CSE 151	Computer Programming	2	0	4	4	6
6	MEC 151	Workshop Practice	0	0	2	1	2
7	PHY 151	Engineering Physics Lab	0	0	2	1	2
8	ENG 102	English Communication: Oral	1	0	2	2	3
9	PPS 102	Personal and Professional Skills-II	0	0	2	1	2
		TOTAL	16	1	12	23	29

III SEMESTER

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 103	Engineering Mathematics– III	3	1	0	4	4
2	ECE 201	Analog Electronics	4	0	0	4	4
3	ECE 202	Signals and Systems	3	1	0	4	4
4	CSE 202	Digital Design	3	0	0	3	3
5	EEE 204	Electromagnetic Theory	4	0	0	4	4
6	ECE 251	Analog Electronics Lab	0	0	2	1	2
7	CSE 252	Digital Design Lab	0	0	2	1	2

8	ECE 253	Signals and Systems Lab with MATLAB	0	0	2	1	2
9	PPS 107	Design Thinking and Team Building	0	0	2	1	2
		TOTAL	17	2	8	23	27

		IV SEMESTER					

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 104	Engineering Mathematics-IV	3	1	0	4	4
2	EEE 205	Control Systems	3	1	0	4	4
3	ECE 206	Linear Integrated Circuits	4	0	0	4	4
4	ECE 207	Microprocessor Programming and Interfacing	4	0	0	4	4
5	ECE 213	Digital Signal Processing	3	1	0	4	4
6	ECE 254	Linear Integrated Circuits Lab	0	0	2	1	2
7	ECE 260	Digital Signal Processing Lab	0	0	2	1	2
8	ECE 256	Microprocessor Programming and Interfacing Lab	0	0	2	1	2
9	PPS 108	Being Corporate Ready	0	0	2	1	2
		TOTAL	17	3	8	24	28

**NOTE: Students will undergo Professional Practice – I during the Summer Break between the fourth and the fifth semesters and the credits earned will be accounted for in the fifth semester.

		V SEMESTER					

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	EEE 209	Electrical and Electronic Measurements and Instrumentation	4	0	0	4	4
2	ECE 210	Analog Communication	4	0	0	4	4
3	ECE 211	Transmission Lines and Waveguides	3	0	0	3	3
4	ECE 3XX	Discipline Elective – I	3	0	0	3	3
5	ECE 3XX	Discipline Elective – II	3	0	0	3	3
6	MGT 112/ MGT 113	Engineering Economics/ Digital Entrepreneurship	3	0	0	3	3
7	EEE 257	Electrical and Electronic Measurements and Instrumentation Lab	0	0	2	1	2
8	ECE 258	Analog Communication Lab	0	0	2	1	2
9	ULC 101	University Learning Course*	0	0	0	1	
10	PIP 101	Professional Practice – I **				5	
		TOTAL	20	0	4	27/28	24

* Student has to register for university learning courses in any one semester 5 / 6 to earn the mandatory credits.

VI SEMESTER

S.NO.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	ECE 212	Digital Communication	3	1	0	4	4
2	ECE 215	VLSI Design	4	0	0	4	4
3	ECE 214	Antenna And Microwave Engineering	3	1	0	4	4
4	MGT 113/ MGT 112	Digital Entrepreneurship / Engineering Economics	3	0	0	3	3
5	ECE 3XX	Discipline Elective – III	3	0	0	3	3
6	ECE 3XX	Open Elective – I	3	0	0	3	3
7	ECE 259	Digital Communication Lab	0	0	2	1	2
8	ECE 262	VLSI Design Lab	0	0	2	1	2
9	ULC 101	University Learning Course*	0	0	0	1	-
		TOTAL	19	2	4	23/24	25

VII SEMESTER

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	ECE 218	Micro Controller Applications	3	0	0	3	3
2	ECE 221	Data Communication and Networking	4	0	0	4	4
3	ECE 216	Information Theory and Coding	4	0	0	4	4
4	ECE 3XX	Discipline Elective – IV	3	0	0	3	3
5	XXX 4XX	Open Elective-II	3	0	0	3	3
6	ECE 263	Micro Controller Applications Lab	0	0	2	1	2
		TOTAL	17	0	2	18	19

VIII SEMESTER

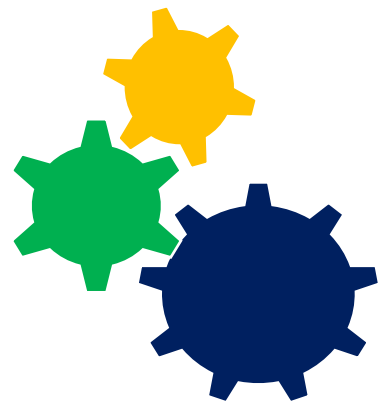| S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	PIP 102	Professional Practice – II				15	
		TOTAL	0	0	0	15	

REGISTRAR

Registrar

PRESIDENCY UNIVERSITY

School of Engineering

Bachelor of Technology Degree
Program Regulations and Curriculum, 2016-2020
B. Tech. (Electronics and Communication Engineering)
2016-2020

((As amended up to the 11th Meeting of the Academic Council held on June, 2019)

Regulations No.:

June, 2019

Bachelor of Technology Degree
Program Regulations and Curriculum, 2016-2020
((As amended up to the 11th Meeting of the Academic Council held on June, 2019)

In exercise of the powers conferred by and in discharge of duties assigned under the relevant provision(s) of the Act, Statutes and Academic Regulations, 2017 of the University, the Academic Council hereby makes the following Regulations, namely;

Preliminary:

Short Title and Commencement

   (a)   These Regulations shall be called the **Bachelor of Technology Degree Program Regulations and Curriculum, 2016-2020**.

   (b)   These Regulations are subject to, and, pursuant to the Academic Regulations, 2017.

   (c)   These Regulations (with amendments) shall be applicable to all on going Bachelor of Technology Degree Programs of the 2016-2020 Batch.

   (d)   These Regulations (with amendments) shall supersede all the earlier Bachelor of Technology Degree Program Regulations and Curriculum**,** along with all the amendments thereto.

   (e)   These Regulations shall come into force with immediate effect.

Definitions:

In these Regulations, unless the context otherwise requires:

   uuu) "Academic Council" means the Academic Council of the University;

   vvv) "Academic Regulations" means the Academic Regulations, 2017 of the University;

   www)   "Academic Term" means a Semester or Summer Term;

   xxx) "Act" means the Presidency University Act, 2013;

   yyy) "Board of Examinations (BOE)" means the Board of Examinations of the University;

   zzz) "Board of Management (BOM)" means the Board of Management of the University;

   aaaa)   "CGPA" means Cumulative Grade Point Average as defined in the Academic Regulations, 2017;

   bbbb)   "Clause" means the duly numbered Clause, with Sub-Clauses included, if any, of these Regulations;

   cccc)   "Course" means, a specific subject usually identified by its Course Code and Course Name, with specified Credit Structure and Credits, Course Description/ Content/ Syllabus, a set of textbooks/ references, taught by assigned Course Instructor(s) to a specific class (group of students) during a specific Academic Term;

   dddd)   "Course Instructor" means the faculty member who is the Teacher/Course Instructor for the concerned Course;

   eeee)   "DAC" means, the Departmental Academic Committee;

   ffff) "Dean" means the Dean of the concerned School;

   gggg)   "HOD" means the Head of the Concerned Department;

   hhhh)   "Parent Department" means the department that offers the Degree Program that a student undergoes;

   iiii) "Program" means the Bachelor of Technology (B.Tech) Degree Program;

   jjjj) "Program Regulations" means the Bachelor of Technology Degree Program

Regulations and Curriculum, 2016-2020;

kkkk) *"Registrar" means the Registrar of the University;*

llll) *"SGPA" means the Semester Grade Point Average as defined in the Academic Regulations, 2017;*

mmmm) *"School" means a constituent institution of the University established for monitoring, supervising and guiding, teaching, training and research activities in broadly related fields of studies;*

nnnn) *"Section" means the duly numbered Section, with Clauses included in that Section, of these Program Regulations;*

oooo) *"Statutes" means the Statutes of Presidency University;*

pppp) *"Sub-Clause" means the duly numbered Sub-Clause of these Program Regulations;*

qqqq) *"Summer Term" means an additional Academic Term conducted during the summer break (typically in June-July) for a duration of about eight (08) calendar weeks, with a minimum of thirty (30) University teaching days, and,*

rrrr) *"University" means Presidency University, Bengaluru;*

10.0 INTRODUCTION:

10.1 The **Academic Regulations, 2017** are applicable to all existing Degree Programs of the University. The Academic Regulations, and any amendments made therein, shall also be applicable to new Degree and Diploma Programs that may be offered by the University in future.

10.2 The **Bachelor of Technology Degree Program Regulations and Curriculum, 2016-2020** are subject to, and, pursuant to the Academic Regulations, 2017.

10.3 These Program Regulations shall be applicable to the following on going **Bachelor of Technology (B.Tech) Degree Programs 2016-2020:**

10.3.1 Bachelor of Technology in Civil Engineering, abbreviated as B.Tech (Civil Engineering);

10.3.2 Bachelor of Technology in Computer Science and Engineering, abbreviated as B.Tech (Computer Science and Engineering);

10.3.3 Bachelor of Technology in Electronics and Communication Engineering, abbreviated as B.Tech (Electronics and Communication Engineering);

10.3.4 Bachelor of Technology in Electrical and Electronics Engineering, abbreviated as B.Tech (Electrical and Electronics Engineering);

10.3.5 Bachelor of Technology in Mechanical Engineering, abbreviated as B.Tech (Mechanical Engineering); and,

10.3.6 Bachelor of Technology in Petroleum Engineering, abbreviated as B.Tech (Petroleum Engineering).

10.4 These Program Regulations shall be applicable to other similar programs, which may be introduced in future.

10.5 These Program Regulations may evolve and get amended or modified or changed through appropriate approvals from the Academic Council, from time to time, and shall be binding on all concerned.

10.6 The effect of periodic amendments or changes in the Program Regulations, on the students admitted in earlier years, shall be dealt with appropriately and carefully, so as to ensure that those students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised Program Regulations, without any undue favour or considerations.
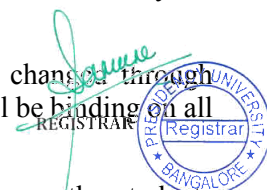
10.7 These Program Regulations are structured as follows:

 10.7.1 **Part A:** Specific regulations relevant to the Bachelor of Technology (B.Tech) Degree Programs in pursuant of the provisions in Section 6.0 of the Academic Regulations, 2017 of the University.

 10.7.2 **Part B:** Program Curriculum for the specific on going Bachelor of Technology (B.Tech) Degree Program of study as enumerated and named in Clause 1.3.

11.0   PART A: PROGRAM SPECIFIC REGULATIONS

11.1   Program Description and Duration

B.Tech. Degree Programs are offered in the following branches/ disciplines by the respective parent Departments as indicated in Table 2.1 below:

Table 2.1
B. Tech Degree Programs and Respective Parent Departments

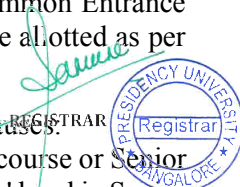| *B.Tech Program (Branch/Discipline)*	*Parent Department*
B.Tech (Civil Engineering)	Department of Civil Engineering
B.Tech (Computer Science and Engineering)	Department of Computer Science and Engineering
B.Tech (Electronics and Communication Engineering)	Department of Electronics and Communication Engineering
B.Tech (Electrical and Electronics Engineering)	Department of Electrical and Electronics Engineering
B.Tech (Mechanical Engineering)	Department of Mechanical Engineering
B.Tech (Petroleum Engineering)	Department of Petroleum Engineering

11.2   Bachelor of Technology Degree Program is a Four-Year, Full-Time Semester based program. The minimum duration of the B.Tech Program is four (04) years and each year comprises of two academic Semesters (Odd and Even Semesters) and hence the duration of the B.Tech program is eight (08) Semesters.

11.3   **Admission Criteria to the Four-Year Bachelor of Technology (B.Tech) Degree Programs**
The University admissions shall be open to all persons irrespective of caste, class, creed, gender or nation. All admissions shall be made on the basis of merit in the qualifying examinations; Provided that forty percent of the admissions in all Programs of the University shall be reserved for the students of Karnataka State and admissions shall be made through a Common Entrance Examination conducted by the State Government or its agency and seats shall be allotted as per the merit and reservation policy of the State Government from time to time**.**

The admission criteria to the B.Tech Program are listed in the following Sub-Clauses.

 11.3.1   An applicant who has successfully completed Pre-University course or Senior Secondary School Course (+2) or equivalent such as (11+1), 'A' level in Senior School Leaving Certificate Course from a recognized University of India or outside or from Senior Secondary Board or equivalent, constituted or recognized by the Union or by the State Government of that Country for the

purpose of issue of qualifying certificate on successful completion of the course, may apply for and be admitted into the Program.

11.3.2 Provided further, the applicant must have taken Physics and Mathematics as compulsory subjects in the Pre-University/ Higher Secondary / (10+2) / (11+1) examination, along with either Chemistry/ Biology/ Electronics/ Computer Science/ Biotechnology subject, and, the applicant must have obtained a minimum of 45% of the total marks (40% in case of candidates belonging to the Reserved Category as classified by the Government of Karnataka) in these subjects taken together.

11.3.3 The applicant must have appeared for Joint Entrance Examinations (JEE) Main / JEE (Advanced) / Karnataka CET / COMED-K, or any other State-level Engineering Entrance Examinations.

11.3.4 Reservation for the SC/ ST and other backward classes shall be made in accordance with the directives issued by the Government of Karnataka from time to time.

11.3.5 Admissions are offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission, issued from time to time, by the Government of India.

11.3.6 Candidates must fulfil the medical standards required for admission as prescribed by the University.

11.3.7 If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation and any other falsification, the Registrar shall report the matter to the Board of Management (BOM), recommending revoking the admission of the candidate.

11.3.8 The decision of the BOM regarding the admissions is final and binding.

11.4 Lateral Entry

The University admits students directly to the second year (3rd Semester) of the B.Tech Degree Program as per the provisions and/ or regulations of the Government of Karnataka pertaining to the "Lateral Entry" scheme announced by the Government from time to time.

Further, the general conditions and rules governing the provision of Lateral Entry to the B.Tech Program of the University are listed in the following Sub-Clauses:

11.4.1 Admission to 2nd year (3rd Semester) of the B.Tech Degree program shall be open to the candidates who are holders of a 3-year Diploma in Engineering (or equivalent qualification as recognized by the University), who have secured not less than forty five percentage (45%) marks in the final year examination (fifth and sixth Semesters of the Diploma Program) in the appropriate branch of Engineering. Provided that, in case of SC/ ST and OBC candidates from Karnataka the minimum marks for eligibility shall be forty percent (40%).

11.4.2 Provided further that, candidates seeking Lateral Entry may be required to complete specified bridge Courses as prescribed by the University. Such bridge Courses, if any, shall not be included in the CGPA computations.

11.4.3 All the existing Regulations and Policies of the University shall be binding on all the students admitted to the Program through the provision of Lateral Entry.

11.4.4 The Course requirements prescribed for the 1st Year of the B.Tech Program shall be waived for the student(s) admitted through Lateral Entry and the duration of the B.Tech Program for such students is three (03) years, commencing from the 3rd Semester (commencement of the 2nd Year) of the B.Tech Program and culminating with the 8th Semester (end of the 4th Year) of the B.Tech Program.

11.4.5 The existing Program Regulations of the concerned Program to which the
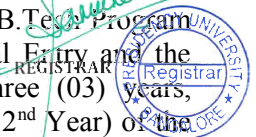
student is admitted through the provision of Lateral Entry shall be binding on the student with effect from the 3rd Semester of the Program. i.e., the Program Structure and Curriculum from the 3rd to 8th Semesters of the Program concerned shall be binding on the student admitted through Lateral Entry. Further, any revisions/ amendments made to the Program Regulations thereafter, shall be binding on all the students of the concerned Program.

11.4.6 All the Courses (and the corresponding number of Credits) prescribed for the 1st Year of the concerned B.Tech Program shall be waived for the student(s) admitted to the concerned B.Tech Program through Lateral Entry. Further, the *Minimum Credit Requirements* for the award of the B.Tech Degree in the concerned Program shall be prescribed/ calculated as follows:

The *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree prescribed by the concerned Bachelor of Technology Degree Program Regulations and Curriculum, 2016-2020, minus the number of Credits prescribed for the 1st Year (total number of Credits prescribed for the 1st and 2nd Semesters) of the B.Tech Program.
For instance, if the *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree as prescribed by the Regulations for B.Tech (Computer Science and Engineering) is "N" Credits, and, if the total credits prescribed in the 1st Year (total credits of the 1st and 2nd Semesters) of the Program concerned is "M" Credits, then the *Minimum Credit Requirements* for the award of the B.Tech in Computer Science and Engineering for a student who joins the Program through the provision of the Lateral Entry, shall be "N – M" Credits.

11.4.7 Further, no other waiver except the Courses prescribed for the 1st year of the B.Tech Program of the University shall be permissible for students joining the B.Tech Program through the provision of Lateral Entry.

11.5 Transfer of student(s) from another recognized University to the 2nd year (3rd Semester) of the B.Tech Program of the University

A student who has completed the 1st Year (i.e., passed in all the Courses/ Subjects prescribed for the 1st Year) of the B.Tech / B.E. / B.S., Four-Year Degree Program from another recognized University, may be permitted to transfer to the 2nd Year (3rd Semester) of the B.Tech Program of the University as per the rules and guidelines prescribed in the following Sub-Clauses:

11.5.1 The concerned student fulfils the criteria specified in Sub-Clauses 2.3.1, 2.3.2 and 2.3.3.

11.5.2 The student shall submit the Application for Transfer along with a non-refundable Application Fee (as prescribed by the University from time to time) to the University no later than July 10 of the concerned year for admission to the 2nd Year (3rd Semester) B.Tech Program commencing on August 1 on the year concerned.

11.5.3 The student shall submit copies of the respective Marks Cards/ Grade Sheets/ Certificates along with the Application for Transfer

11.5.4 The transfer may be provided on the condition that the Courses and credits completed by the concerned student in the 1st Year of the B.Tech/ B.E./ B.S. Four Degree Program from the concerned University, are declared equivalent and acceptable by a Committee constituted by the Vice Chancellor for this purpose. Further, the Committee may also prescribe the Courses and Credits the concerned students shall have to mandatorily complete, if admitted to the 2nd Year of the B.Tech Program of the University.

       11.5.5   The Branch/Discipline allotted to the student concerned shall be the decision of the University and binding on the student.

11.6 Change of Branch/ Discipline

A student admitted to a particular Branch of the B.Tech Program will normally continue studying in that Branch till the completion of the program. However, the University reserves the right to provide the option for a change of Branch, or not to provide the option for a change of Branch, at the end of 1st Year of the B.Tech Program to eligible students in accordance with the following rules and guidelines: framed by the University from time to time.

       11.6.1   Normally, only those students, who have passed all the Courses prescribed for the 1st Year of the B.Tech Program and obtained a CGPA of not less than 6.00 at the end of the 2nd Semester, shall be eligible for consideration for a change of Branch.

       11.6.2   Change of Branch, if provided, shall be made effective from the commencement of the 3rd Semester of the B.Tech Program. There shall be no provision for change of Branch thereafter under any circumstances whatsoever.

       11.6.3   The student provided with the change of Branch shall fully adhere to and comply with the Program Regulations of the concerned Branch of the B.Tech Program, the Fee Policy pertaining to that Branch of the B.Tech Program, and, all other rules pertaining to the changed Branch existing at the time.

       11.6.4   Change of Branch once made shall be final and binding on the student. No student shall be permitted, under any circumstances, to refuse the change of Branch offered.

       11.6.5   The eligible student may be allowed a change in Branch, strictly in order of *inter se* merit, subject to the conditions given below:

          11.6.5.1 The actual number of students in the third Semester in any particular Branch to which the transfer is to be made, should not exceed the intake fixed by the University for the concerned Branch; and,

          11.6.5.2 The actual number of students in any Branch from which transfer is being sought does not fall below 75% of the total intake fixed by the University for the concerned Branch.

       11.6.6   The process of change of Branch shall be completed within the first five days of Registration for the 3rd Semester of the B.Tech Program.

11.7 Professional Practice Courses

Professional Practice Courses (Professional Practice – I and Professional Practice – II) are practice based Courses with the objective to equip students with the skills of problem identification, root cause analysis and problem solving, innovation and design thinking through industry exposure and project based learning. The expected outcomes are first level proficiency in problem solving and design thinking skills to better equip B.Tech graduates for their professional careers.

The method of evaluation and grading for the Professional Practice Courses shall be prescribed and approved by the concerned Departmental Academic Committee (refer Annexure A of the Academic Regulations, 2017). The same shall be prescribed in the Course Handout.

11.8 Professional Practice – I

Professional Practice – I is a 5 - Credit Course. This first level practice based course is conducted after the 4th Semester of the B.Tech Program, during the summer break (usually June – July), in accordance with the following options and guidelines:

11.8.1 *Internship Program in an Industry/ Company:*
A student may undergo an Internship Program for a period of 6 – 8 weeks in an industry/ company, subject to the following conditions:

11.8.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

11.8.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, and any other qualifying criteria) as applicable/ stipulated by the concerned Industry/ Company for award of the Internship to a student;

11.8.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of internships shall be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/Company providing the Internship, as stated in Sub-Clause 2.8.1.2 above.

11.8.1.4 A student may opt for Internship in an Industry/ Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

11.8.1.5 A student selected for an Internship in an industry/ company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

11.8.2 *Project Work:*
A student may opt to do a Project Work in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

11.8.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

11.8.2.2 The student may do the project work in an Industry/ Company/ Research Laboratory of her/ his choice subject to the above mentioned condition (Sub-Clause 2.8.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the project work will be conducted in accordance with the Program Regulations and requirements of the University.

11.9 *Professional* **Practice – II**
Professional Practice - II is an intensive practice based course with 15 Credits offered during the final (4th) year of the B.Tech Program. Students may register for Professional Practice – II in either the 7th Semester or the 8th Semester of the B.Tech Program, in accordance with the following guidelines:

11.9.1 *Internship Program in an Industry/ Company:*
A student may undergo an Internship Program for a period of about 15 weeks in an Industry/ Company, subject to the following conditions:

11.9.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

11.9.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, any other qualifying criteria) as applicable/ stipulated by the concerned Industry/ Company for award of Internship to a student;

11.9.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of Internships will be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry/ Company providing the Internship, as stated in Sub-Clause 2.9.1.2 above.

11.9.1.4 A student may opt for Internship in an Industry/ Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/ his own. Provided further, that the Industry/ Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

11.9.1.5 A student selected/ awarded an Internship Program in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

11.9.2 *Project Work and Dissertation:*
A student may do an extensive Project Work (with a Dissertation) in an Industry/ Company/ Research Laboratory or the University Department(s), subject to the following conditions:

11.9.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

11.9.2.2 The student may do the Project Work in an Industry/ Company/ Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.9.2.1). Provided further, that the Industry/ Company/ Research Laboratory offering such project work confirms to the University that the Project Work will be conducted in accordance with the Program Regulations and requirements of the University.
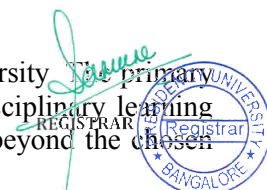
11.10 University Learning Courses

The objective of a University Learning Course (ULC) is to sensitize and inculcate commitment to social and environmental issues and make a contribution through service and experiential learning. The outcome is to produce graduates who are sensitized and committed to serving the social and environmental needs of society.

The ULC is a 1- Credit Course coordinated by the parent Department or a group of Departments and the student is required to complete this course ideally during any of the Semesters of the 2nd or 3rd Year of the B.Tech Program. The nature and details of the ULC shall be approved by the concerned Departmental Academic Committee (DAC). As per the Academic Regulations, the 'S' grade is awarded for "satisfactory completion" of the Course and 'NC' grade is awarded for "non-completion" of the Course. The student who receives the "NC" grade shall repeat the ULC (it may be another type of ULC as approved by the concerned DAC) until the concerned student secures the "S" grade in the ULC. The "S" and "NC" grades do not carry grade points and hence not included in the SGPA, CGPA computations.

11.11 Open Electives

Open Electives are Courses offered by any Department/ School of the University. The primary objective of offering Open Electives is to provide interdisciplinary/ transdisciplinary learning experiences. The outcome is a graduate with a fair exposure to disciplines beyond the chosen Branch in the B.Tech Program.

Open Electives offered by any Department/ School of the University are listed in the Course Structure under the Open Elective category and offered to students of any Department including the parent Department/ School.

The Course details and method of evaluation shall be clearly prescribed in the concerned Course Handout.

11.12 **Specific Regulations regarding Assessment and Evaluation (Refer clause 8.5 to 8.8 of the Academic Regulations, 2017)**

The components of continuous assessments, weightage for each component and the method of evaluation shall be assigned considering the nature of the Courses in terms of the pedagogy and outcomes.

11.12.1 Normally, for the Courses that have only the Lecture and Tutorial or Lecture Credit Structure (L – T – 0)/ (L – 0 – 0), with no Practical component, the components of Continuous Assessment and the distribution of weightage among the components of continuous assessment and duration of the examination/assessment shall be as detailed in Table 2.12.1 below:

Table 2.12.1 Method of Assessment for Courses with Credit Structure L –T – 0 and L –0 –0		
Components of Continuous Assessments	**Weightage (% of Total Marks)**	**Duration of Assessment**
1. Test 1	20%	1 hour
2. Test 2	20%	1 hour
3. This component of continuous assessment shall consist of at least TWO (02) of the following: (1) Assignment(s) (2) Quiz (3) Technical Seminar / Report (4) Attendance / Class participation (5) Assessment on self-learning topic(s), or (6) Any other type of assessment as prescribed in the concerned Course Handout.	20%	NA
4. End Term Final Examinations	40%	2 or 3 hours
Total	**100%**	
Note: An additional Test 3 may be conducted as an optional test to allow for improvement. If a Test 3 is provided, then the higher marks obtained in any two tests shall be considered for evaluation.		

11.12.2 Normally, for Laboratory/Practice Based Courses with a Credit Structure of (0 – 0 – P), or (L – 0 – P), the components of Continuous Assessment and the distribution of weightage among the components of Continuous Assessment and duration of the examination/assessment shall be as detailed in Table 2.12.2 below:

Table 2.12.2 Method of Assessment for Practical Courses with Credit Structure 0 –0 – P and L – 0 – P		
Components of Continuous Assessments	**Weightage (% of Total Marks)**	**Duration of Assessment**

1.	Laboratory / Practical exercises, conducted in every Practical Class and Laboratory Records, Practical / Project Reports as prescribed by the Course Handout.	50%	NA
2.	Practical Test / Viva/ Quiz /Assignments as prescribed in the Course Handout.	20%	NA
3.	End Term Practical Examinations	30%	2 or 3 hours
	Total	**100%**	

11.12.3 Normally, for Practice/Skill based Courses, without a defined credit structure (L – T – P), but with assigned Credits, (as defined in Clause 5.2 of the Academic Regulations, 2017), the method of evaluation shall be based only on Continuous Assessments. The various components of Continuous Assessments, the distribution of weightage among such components, and the method of evaluation/assessment, shall be prescribed in the concerned Course Handout. There shall be no component of End Term Final Examinations for such Courses.

11.12.4 In case any exception is required for a particular Course, where the methods of assessment prescribed in the specific regulations mentioned above in Sub-Clauses 2.12.1, 2.12.2 and 2.12.3 are not suitable/ relevant for the assessing the performance in the concerned Course, the BOS shall recommend the appropriate method of assessment for approval of the Academic Council.

11.13 **Course Handout**

The Course Handout (Refer Clause 6.2 of the Academic Regulations, 2017) is a comprehensive document describing the Objectives/ Outcomes of the Course, the detailed syllabus (with the prescribed Text Book(s) and Reference Material), the Lesson/ Session-wise Plan, and all the relevant and necessary details regarding the pedagogy, expectation from the students regarding preparation, participation and self-learning, components of continuous assessment and respective weightage (in percentage (%) of the total marks of all components of assessment) given to the components, and the method of evaluation. The guidelines for preparation of the Course Handout, its approval and delivery is listed in the following Sub-Clauses:

11.13.1   Normally the Course Handout is prepared by the Course Instructor(s) assigned to teach the Course. In cases of multiple sections of students registered for the same Course, an Instructor In-Charge, assigned by the DAC, shall prepare the Course Handout in consultation with the other Course Instructors assigned to the concerned Course.

11.13.2   The DAC shall examine each Course Handout and arrange for necessary deliberations as required. On acceptance of the completeness and quality of the Course Handout, the DAC shall approve the Course Handout.

11.13.3   A consolidated printed/ soft copy of the Booklet of all Course Handouts corresponding to the concerned Semester of a particular Program of Study shall be provided to every student concerned on the first day/Registration day of the concerned Semester.

11.13.4   The Course Handout Booklet is a very important guide for the student registered in the concerned course. The students are expected to use the Course Handout Booklet to prepare regularly and benefit from each session (lecture/ tutorial/ practical) of the Course(s) and perform well in the continuous assessments and End Term Final Examinations as applicable. Every student shall read and adhere to all the guidelines prescribed in the Course Handout Booklet.

8.14.   **Rules and Guidelines for Transfer of Credits from SWAYAM-NPTEL Courses**

(Refer Section 18.0 of the Academic Regulations.)

The provisions and rules pertaining to the transfer of credits are outlined in Section 18.0 of the Academic Regulations. The Rules and Guidelines for the transfer of credits specifically from the On-line Courses conducted by the Study Webs of Active-Learning for Young Aspiring Minds-National Program on Technology Enhanced Learning (SWAYAM-NPTEL) (Refer Sub-Clause 18.2 of the Academic Regulations) are as stated in the following Sub-Clauses:

8.14.1. A student may complete SWAYAM-NPTEL courses and transfer equivalent credits to partially or fully complete the mandatory credit requirements of Discipline Elective Courses and/or the mandatory credit requirements of Open Elective Courses as prescribed in the concerned B.Tech Program Regulations and Curriculum. However, it is the sole responsibility of the student to complete the mandatory credit requirements of the Discipline Elective Courses and the Open Elective Courses as prescribed by the Program Regulations and Curriculum of the concerned B.Tech Program.

8.14.2. Approved SWAYAM-NPTEL Courses shall be included as annexes to the Program Regulations and Curriculum for the concerned B.Tech Program and shall be announced through University Notifications to the students from time to time. A student shall only request for transfer of credits from such approved/notified SWAYAM-NPTEL Courses as published by the concerned Departments.

8.14.3. SWAYAM-NPTEL Courses are considered for transfer of credits only if the concerned student has successfully completed the SWAYAM-NPTEL Course(s) and obtained the SWAYAM-NPTEL Certificate to this effect.

8.14.4. A student cannot transfer credits from SWAYAM-NPTEL Courses to earn the mandatory credits assigned for any other type of Courses (other than Discipline and Open Elective Courses) as prescribed in the concerned Program Regulations and Curriculum. However, a student may complete SWAYAM-NPTEL Courses and transfer equivalent credits in excess of the required mandatory credits (and Courses).

8.14.5. Before the commencement of each Semester or during Pre-Registration schedule as per the Academic Calendar, Parent Departments may release a list of SWAYAM-NPTEL courses approved as Discipline Elective courses for each B.Tech Program offered by them. In addition, Departments may also release a list of Open Elective courses for all B.Tech Programs.

8.14.6. Students may Pre-Register for the approved SWAYAM-NPTEL Courses in the respective Departments and register for the SWAYAM-NPTEL Courses as per the schedule announced by SWAYAM-NPTEL.

8.14.7. The credit equivalence of the SWAYAM-NPTEL Courses are based on course durations and/or as recommended by SWAYAM-NPTEL. The Credit Equivalence mapped to SWAYAM-NPTEL course durations for transfer of credits is summarised in Table 2.14.1.

Table 2.14.1 SWAYAM-NPTEL Course Durations and Credit Equivalence		
Sl. No.	**Course Duration**	**Credit Equivalence for Transfer of Credits**
1	4 Weeks	1 Credit
2	8 Weeks	2 Credits
3	12 Weeks	3 Credits

8.14.8.   A student who has successfully completed the approved SWAYAM-NPTEL Course(s) and wants to avail the provision of transfer of equivalent credits to fulfill (partially or fully) the mandatory credit requirements of the Discipline Electives and/or Open Electives as prescribed in the concerned Program Regulations and Curriculum, must submit the original SWAYAM-NPTEL Course Certificates to the Head of the Parent Department concerned, with a written request for the transfer of the equivalent credits. On verification of the SWAYAM-NPTEL Course Certificates and approval by the Head of the Department concerned, the SWAYAM-NPTEL Course(s) and equivalent Credits will be included in Course (with associated Credits) Registration of the concerned student in the Semester immediately following the completion of the SWAYAM-NPTEL Course(s).

8.14.9. The grading system for such SWAYAM-NPTEL Courses with transfer of credits is specified in Table 2.14.2.

Table 2.14.2 Grading System for SWAYAM-NPTEL Courses		
Sl. No.	**Final Score on the SWAYAM-NPTEL Certificate**	**Grade Awarded**
1	90% and above	O

Table 2.14.2 Grading System for SWAYAM-NPTEL Courses		
Sl. No.	Final Score on the SWAYAM-NPTEL Certificate	Grade Awarded
2	From 80% to 89%	A+
3	From 70% to 79%	A
4	From 60% to 69%	B+
5	From 50% to 59%	B
6	From 40% to 49%	C

8.14.10. A students may submit a request for credit transfer from SWAYAM-NPTEL Courses before the last instruction day of the seventh (7th) Semester of the B. Tech. program as specified in the Academic Calendar. Requests for credit transfers shall not be permissible in the eighth (8th) semester.

8.14.11. The maximum permissible number of credits that a student may request for transfer in a Semester is ten (10) credits.

8.14.12. The University shall not reimburse any fees/expense, a student may incur for the SWAYAM-NPTEL Courses.

12.0   PART B:

BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN

ELECTRONICS AND COMMUNICATION ENGINEERING
B.Tech (Electronics and Communication Engineering) Program, 2016-2020

12.1 PROGRAM CURRICULUM

12.1.1 Mandatory Courses and Credits

The B.Tech (Electronics and Communication Engineering) Program structure (2016-2020) consists of 58 courses totaling 182 credits.

Table 3.1.1 summarizes the type of Courses, number of Courses under each type and the associated credits that are mandatorily required for the completion of the Degree.

TABLE 3.1.1
B.Tech (Electronics and Communication Engineering) 2016-2020: Mandatory Courses and Credits

S. No	TYPE OF COURSES	NO. OF COURSES	CREDITS
1	Humanities, Social Sciences and Management Sciences(HS)	6	14
2	Basic Sciences (BS)	8	32
3	Engineering Sciences (ES)	5	18
4	Core (Professional) Course (CC)	28	77
5	Discipline(Professional) Elective (DE)	4	12
6	Open Elective (OE)	2	6
7	Professional Practice (PP) I and II	2	20
8	Personal and Professional Skills (PPS)	2	2
9	University Learning Courses (ULC)	1	1
	TOTAL	**58**	**182**
	The mandatory minimum credits required for the award of the B.Tech (Electronics and Communication Engineering) Degree is 182 Credits		

The Table-1 is indicative of various components such as Foundation Courses (Basic Sciences, Engineering Sciences, Humanities, Social Sciences and Management Sciences), Professional Core, Discipline and Open Elective Courses. The unique feature of this Program is Professional Practice - I of 6-8 weeks during the end of 4th Semester and before the commencement of 5th Semester for the student to have industry exposure. The Professional Practice - II will be during their 7th / 8th Semester for about 15 weeks. University Learning Course, which is mandatory, is introduced in the curriculum for the student to give value of social service such as community service, clean and green, NSS, Protection of environment and health hazards, etc.

Table-1 lists the mandatory courses, type of courses, number of type of courses and the associated credits required for the completion of the B.Tech (Electronics and Communication Engineering) Program.

12.1.2 B.Tech. (Electronics and Communication Engineering) Program Year Wise Structure

First Year			Second Year			Third Year			Fourth	
Sem. 1	Sem. 2	Summer Term	Sem.3	Sem. 4	Summer Term/PP-I-1	Sem. 5	Sem. 6	Summer Term	Sem. 7	Sem. 8
BS-3 ES-2 HS-3	BS-3 ES-3 HS-1		BS-1 CC-7 PPS-1	BS-1 CC-7 PPS-1		CC-5 HS-1 DE-1 ULC-1	CC-6 HS-1 DE-1		CC-3 DE-2 OE-2	PP-II-1

Mandatory Minimum Credits required for the award of the B.Tech (Electronics and Communication Engineering) Degree: 182

Nomenclature:

BS - Basic Sciences
ES - Engineering Sciences
HS – Humanities, Social Sciences and Management Sciences
CC - Core Courses
DE - Discipline/Professional Electives
OE - Open Electives
PP-I/PP-II - Professional Practice
PPS-Personal and Professional Skills
ULC - University Learning Course

In the entire program, the practical and skill based course component contribute to an extent of approximately 30% out of the total credits of 182 for B.Tech (Electronics and Communication Engineering) Program of four years duration.

REGISTRAR
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PRESIDENCY UNIVERSITY BANGALORE

12.2 **Program Structure**

I SEMESTER

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	ENG A 101	English	3	0	0	3	3
2	PHY A 103	Engineering Physics	3	0	2	4	5
3	BIO A 104	General Biology	3	0	2	4	5
4	ME A 103	Engineering Graphics	2	0	4	4	6
5	MATH A 105	Calculus	3	1	0	4	4
6	ME A 112	Material Science	3	1	0	4	4
7	PUE A 106	Introduction to University Academic Processes	1	0	0	1	1
8	PUE A 108	Introduction to Appreciation of Library and its Uses	1	0	0	1	1
		TOTAL	19	2	8	25	29

II SEMESTER

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MATH A 104	Differential Equations, Fourier Series and Laplace Transforms	3	1	0	4	4
2	CHE A 103	Engineering Chemistry	3	0	2	4	5
3	ENG A 102	Technical Report Writing	3	0	0	3	3
4	MATHS A 102	Probability and Statistics	3	1	0	4	4
5	COE A 102	Computer Programming	3	0	2	4	5
6	EEE A 104	Electrical Sciences	3	2	0	4	5
7	ME A 108	Workshop Practice	1	0	2	2	3
		TOTAL	19	4	6	25	29

III SEMESTER

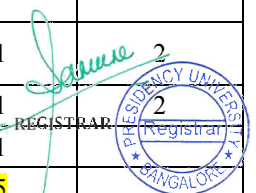| S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 103	Engineering Mathematics – III	3	1	0	4	
2	CIV 102	Environmental Science and Disaster Management	3	0	0	3	
3	ECE 201	Analog Electronics	4	0	0	4	4
4	ECE 202	Signals and Systems	4	0	0	4	4
5	ECE 203	Digital Design	4	0	0	4	4

6	ECE 251	Analog Electronics Lab	0	0	2	1	2
7	ECE 252	Digital Design Lab	0	0	2	1	2
8	ECE 253	Signals and Systems Lab with MATLAB	0	0	4	2	4
9	PPS 101	Personal and Professional Skills – I	0	0	2	1	2
		TOTAL	18	1	10	24	29

		IV SEMESTER					

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MAT 104	Engineering Mathematics– IV	3	1	0	4	4
2	ECE 205	Control Systems	4	0	0	4	4
3	ECE 206	Linear Integrated Circuits	4	0	0	4	4
4	ECE 207	Microprocessor Programming and Interfacing	4	0	0	4	4
5	ECE 213	Digital Signal Processing	3	1	0	4	4
6	ECE 254	Linear Integrated Circuits Lab	0	0	2	1	2
7	ECE 260	Digital Signal Processing Lab	0	0	2	1	2
8	ECE 256	Microprocessor Programming and Interfacing Lab	0	0	2	1	2
9	PPS 102	Personal and Professional Skills - II	0	0	2	1	2
		TOTAL	18	2	8	24	28

**NOTE: Students will undergo Professional Practice – I during the Summer Break between the fourth and the fifth semesters and the credits earned will be accounted for in the fifth semester.

		V SEMESTER					

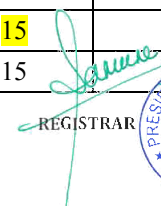| S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	EEE 209	Electrical and Electronic Measurements and Instrumentation	4	0	0	4	4
2	ECE 210	Analog Communication	4	0	0	4	4
3	ECE 217	Electromagnetic Theory and Transmission Lines	3	1	0	4	4
4	ECE 3XX	Discipline Elective – I	3	0	0	3	3
5	MGT 112/ MGT 113	Engineering Economics/ Digital Entrepreneurship	3	0	0	3	3
6	EEE 257	Electrical and Electronic Measurements and Instrumentation Lab	0	0	2	1	2
7	ECE 258	Analog Communication Lab	0	0	2	1	2
8	ULC 101	University Learning Course*	0	0	0	1	
9	PIP 101	Professional Practice – I **				5	
		TOTAL	17	1	4	25/26	22

* Student has to register for university learning courses in any one semester 5 / 6 to earn the mandatory credits.

VI SEMESTER

S. NO	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	ECE 212	Digital Communication	3	1	0	4	4
2	ECE218	Micro Controller Application	3	0	0	3	3
3	ECE 214	Antenna And Microwave Engineering	3	1	0	4	4
4	ECE219	Computer Communication & Networks	3	0	0	3	3
5	MGT 113/ MGT 112	Digital Entrepreneurship / Engineering Economics/	3	0	0	3	3
6	ECE 3XX	Discipline Elective – II	3	0	0	3	3
7	ECE 259	Digital Communication Lab	0	0	2	1	2
8	ECE 263	Micro Controller Application Lab	0	0	2	1	2
9	ULC 101	University Learning Course *	0	0	0	1	
		TOTAL	18	2	4	22/23	24

VII SEMESTER

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	ECE 215	VLSI Design	4	0	0	4	4
2	ECE 216	Information Theory and Coding	4	0	0	4	4
3	ECE 3XX	Discipline Elective – III	3	0	0	3	3
4	ECE 3XX	Discipline Elective – IV	3	0	0	3	3
5	XXX 4XX	Open Elective-I	3	0	0	3	3
6	XXX 4XX	Open Elective-II	3	0	0	3	3
7	ECE 262	VLSI Design Lab	0	0	2	1	2
		TOTAL	20	0	2	21	22

VIII SEMESTER

S. No	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	PIP 102	Professional Practice – II				15	
		TOTAL	0	0	0	15	

REGISTRAR

Registrar

PRESIDENCY UNIVERSITY

School of Engineering

Bachelor of Technology Degree Program Regulations and Curriculum, 2017
B.Tech. (Electronics and Communication Engineering)
2015-2019

Regulations No.: PU/AC-05/09/05_2017

May, 2017

Resolution No.05 of the Fifth Meeting of the Academic Council held on May 11, 2017, and ratified by the Board of Management in its Fifth Meeting held on May 12, 2017.

Bachelor of Technology Degree

Program Regulations and Curriculum, 2017

In exercise of the powers conferred by and in discharge of duties assigned under the relevant provision(s) of the Act, Statutes and Academic Regulations, 2017 of the University, the Academic Council hereby

makes the following Regulations, namely;

Preliminary:

Short Title and Commencement

    (a)   These Regulations shall be called the **Bachelor of Technology Degree Program Regulations and Curriculum, 2017**.

    (b)   The **Bachelor of Technology Degree Program Regulations and Curriculum, 2017** are subject to, and, pursuant to the Academic Regulations, 2017

    (c)   These Regulations shall be applicable to the ongoing Bachelor of Technology Degree Programs, and to all other Bachelor of Technology Degree Programs which may be introduced in future.

    (d)   These Regulations shall supersede all the earlier Bachelor of Technology Degree Program Regulations and Curriculum**,** along with all the amendments thereto.

    (e)   These Regulations shall come into force from the Academic Session 2017-18.

Definitions:

In these Regulations, unless the context otherwise requires:

    ssss) *"Academic Council" means the Academic Council of the University;*

    tttt) *"Academic Regulations" means the Academic Regulations, 2017 of the University;*

    uuuu) *"Academic Term" means a Semester or Summer Term;*

    vvvv) *"Act" means the Presidency University Act, 2013;*

    wwww) *"Board of Examinations (BOE)" means the Board of Examinations of the University;*

    xxxx) *"Board of Management (BOM)" means the Board of Management of the University;*

    yyyy) *"CGPA" means Cumulative Grade Point Average as defined in the Academic Regulations, 2017;*

    zzzz) *"Clause" means the duly numbered Clause, with Sub-Clauses included, if any, of these Regulations;*

    aaaaa) *"Course" means, a specific subject usually identified by its Course Code and Course Name, with specified Credit Structure and Credits, Course Description/Content/Syllabus, a set of textbooks/references, taught by assigned Course Instructor(s) to a specific class (group of students) during a specific Academic Term;*

    bbbbb) *"Course Instructor" means the faculty member who is the Course Instructor for the concerned Course;*

    ccccc) *"DAC" means, the Departmental Academic Committee;*

    ddddd) *"Dean" means the Dean of the concerned School;*

    eeeee) *"HOD" means the Head of the Concerned Department;*

    fffff) *"Parent Department" means the department that offers the Degree Program that a student undergoes;*

    ggggg) *"Program" means the Bachelor of Technology (B.Tech) Degree Program;*

    hhhhh) *"Program Regulations" means the Bachelor of Technology Degree Program Regulations and Curriculum, 2017;*

    iiiii) *"Registrar" means the Registrar of the University;*

jjjjj) *"SGPA" means the Semester Grade Point Average as defined in the Academic Regulations, 2017;*

kkkkk) *"School" means a constituent institution of the University established for monitoring, supervising and guiding, teaching, training and research activities in broadly related fields of studies;*

lllll) *"Section" means the duly numbered Section, with Clauses included in that Section, of these Program Regulations;*

mmmmm) *"Statutes" means the Statutes of Presidency University;*

nnnnn) *"Sub-Clause" means the duly numbered Sub-Clause of these Program Regulations;*

ooooo) *"Summer Term" means an additional Academic Term conducted during the summer break (typically in June-July) for a duration of about eight (08) calendar weeks, with a minimum of thirty (30) University teaching days, and,*

ppppp) *"University" means Presidency University, Bengaluru;*

13.0 INTRODUCTION:

13.1 The **Academic Regulations, 2017** are applicable to all existing Degree Programs of the University. The Academic Regulations, and any amendments made therein, shall also be applicable to new Degree and Diploma Programs that may be offered by the University in future.

13.2 The **Bachelor of Technology Degree Program Regulations and Curriculum, 2017** are subject to, and, pursuant to the Academic Regulations, 2017.

13.3 These Program Regulations shall be applicable to the following ongoing **Bachelor of Technology (B.Tech) Degree Programs:**

13.3.1 Bachelor of Technology in Civil Engineering, abbreviated as B.Tech (Civil Engineering);

13.3.2 Bachelor of Technology in Computer Science and Engineering, abbreviated as B.Tech (Computer Science and Engineering);

13.3.3 Bachelor of Technology in Electrical and Electronics Engineering, abbreviated as B.Tech (Electrical and Electronics Engineering);

13.3.4 Bachelor of Technology in Electronics and Communication Engineering, abbreviated as B.Tech (Electronics and Communication Engineering);

13.3.5 Bachelor of Technology in Mechanical Engineering, abbreviated as B.Tech (Mechanical Engineering); and,

13.3.6 Bachelor of Technology in Petroleum Engineering, abbreviated as B.Tech (Petroleum Engineering).

13.4 These Program Regulations shall be applicable to other similar programs, which may be introduced in future.

13.5 These Program Regulations may evolve and get amended or modified or changed through appropriate approvals from the Academic Council, from time to time, and shall be binding on all concerned.

13.6 The effect of periodic amendments or changes in the Program Regulations, on the students

admitted in earlier years, shall be dealt with appropriately and carefully, so as to ensure that those students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised Program Regulations, without any undue favor or considerations.

13.7 These Program Regulations are structured as follows:

13.7.1 **Part A:** Specific regulations relevant to the Bachelor of Technology (B.Tech) Degree Programs in pursuant of the provisions in Section 6.0 of the Academic Regulations, 2017 of the University.

13.7.2 **Part B:** Program Curriculum for the specific ongoing Bachelor of Technology (B.Tech) Degree Program of study as enumerated and named in Clause 1.3.

14.0 PART A: PROGRAM SPECIFIC REGULATIONS

14.1 **Program Description and Duration**
B.Tech. Degree Programs are offered in the following branches/disciplines by the respective parent Departments as indicated in Table 2.1 below:

Table 2.1 B. Tech Degree Programs and respective Parent Departments	
B.Tech Program (Branch/Discipline)	*Parent Department*
B.Tech (Civil Engineering)	Department of Civil Engineering
B.Tech (Computer Science and Engineering)	Department of Computer Science and Engineering
B.Tech (Electrical and Electronics Engineering)	Department of Electrical and Electronics Engineering
B.Tech (Electronics and Communication Engineering)	Department of Electronics and Communication Engineering
B.Tech (Mechanical Engineering)	Department of Mechanical Engineering
B.Tech (Petroleum Engineering)	Department of Petroleum Engineering

14.2 Bachelor of Technology Degree Program is a Four-Year, Full-Time Semester based program. The minimum duration of the B.Tech Program is four (04) years and each year comprises of two academic Semesters (Odd and Even Semesters) and hence the duration of the B.Tech program is eight (08) Semesters.

14.3 **Admission Criteria to the Four-Year Bachelor of Technology (B.Tech) Degree Programs**
The University admissions shall be open to all persons irrespective of caste, class, creed, gender or nation. All admissions shall be made on the basis of merit in the qualifying examinations; Provided that forty percent of the admissions in all Programs of the University shall be reserved for the students of Karnataka State and admissions shall be made through a Common Entrance Examination conducted by the State Government or its agency and seats shall be allotted as per the merit and reservation policy of the State Government from time to time**.**

The admission criteria to the B.Tech Program is listed in the following Sub-Clauses.

14.3.1 An applicant who has successfully completed Pre-University course or Senior Secondary School course (+2) or equivalent such as (11+1), 'A' level in Senior

School Leaving Certificate Course from a recognized University of India or outside or from Senior Secondary Board or equivalent, constituted or recognized by the Union or by the State Government of that Country for the purpose of issue of qualifying certificate on successful completion of the course, may apply for and be admitted into the course.

14.3.2 Provided further, the applicant must have taken Physics and Mathematics as compulsory subjects in the Pre-University/Higher Secondary / (10+2) / (11+1) examination, along with either Chemistry/ Biology/ Electronics/ Computer Science/Biotechnology subject, and, the applicant must have obtained a minimum of 45% of the total marks (40% in case of candidates belonging to the Reserved Category as classified by the Government of Karnataka) in these subjects taken together.

14.3.3 The applicant must have appeared for Joint Entrance Examinations (JEE) Main / JEE (Advanced) / Karnataka CET / COMED-K, or any other State-level Engineering Entrance Examinations.

14.3.4 Reservation for the SC/ST and other backward classes shall be made in accordance with the directives issued by the Government of Karnataka from time to time.

14.3.5 Admissions are offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission, issued from time to time, by the Government of India.

14.3.6 Candidates must fulfill the medical standards required for admission as prescribed by the University.

14.3.7 If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation and any other falsification, the Registrar shall report the matter to the Board of Management (BOM), recommending revoking the admission of the candidate.

14.3.8 The decision of the BOM regarding the admissions is final and binding.

14.4 **Lateral Entry**

The University admits students directly to the second year (3rd Semester) of the B.Tech Degree program as per the provisions and/or regulations of the Government of Karnataka pertaining to the "Lateral Entry" scheme announced by the Government from time to time.

Further, the general conditions and rules governing the provision of Lateral Entry to the B.Tech Program of the University are listed in the following Sub-Clauses:

14.4.1 Admission to 2nd year (3rd Semester) of the B.Tech Degree program shall be open to the candidates who are holders of a 3-year Diploma in Engineering (or equivalent qualification as recognized by the University), who have secured not less than forty five percentage (45%) marks in the final year examination (fifth and sixth Semesters of the Diploma Program) in the appropriate branch of Engineering. Provided that, in case of SC/ST and OBC candidates from Karnataka the minimum marks for eligibility shall be forty percent (40%).

14.4.2 Provided further that, candidates seeking lateral entry may be required to complete specified bridge Courses as prescribed by the University. Such bridge Courses, if any, shall not be included in the CGPA computations.

14.4.3 All the existing Regulations and Policies of the University shall be binding on all the students admitted to the Program through the provision of Lateral Entry.

14.4.4 The Course requirements prescribed for the 1st Year of the B.Tech Program shall be waived for the student(s) admitted through Lateral Entry and the duration of the B.Tech Program for such students is three (03) years, commencing from the 3rd Semester (commencement of the 2nd Year) of the B.Tech Program and culminating with the 8thSemester (end of the 4th Year) of the B.Tech Program.

14.4.5 The existing Program Regulations of the concerned Program to which the student is admitted through the provision of Lateral Entry shall be binding on the student with effect from the 3rd Semester of the Program. i.e., the Program Structure and Curriculum from the 3rd to 8th Semesters of the Program concerned shall be binding on the student admitted through Lateral Entry. Further, any revisions/amendments made to the Program Regulations thereafter, shall be binding on all the students of the concerned Program.

14.4.6 All the Courses (and the corresponding number of Credits) prescribed for the 1st Year of the concerned B.Tech Program shall be waived for the student(s) admitted to the concerned B.Tech Program through Lateral Entry. Further, the *Minimum Credit Requirements* for the award of the B.Tech Degree in the concerned Program shall be prescribed/calculated as follows:

The *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree prescribed by the concerned Bachelor of Technology Degree Program Regulations and Curriculum, 2017, minus the number of Credits prescribed for the 1st Year (total number of Credits prescribed for the 1st and 2ndSemesters) of the B.Tech Program.
For instance, if the *Minimum Credit Requirements* for the award of the Bachelor of Technology (B.Tech) Degree as prescribed by the Regulations for B.Tech (Computer Science and Engineering) is "N" Credits, and, if the total credits prescribed in the 1st Year (total credits of the 1st and 2nd Semesters) of the Program concerned is "M" Credits, then the *Minimum Credit Requirements* for the award of the B.Tech in Computer Science and Engineering for a student who joins the Program through the provision of the Lateral Entry, shall be "N – M" Credits.

14.4.7 Further, no other exemptions except the Courses prescribed for the 1st year of the B.Tech Program of the University shall be permissible for students joining the B.Tech Program through the provision of Lateral Entry.

14.5 Transfer of student(s) from another recognized University to the 2nd year (3rdSemester) of the B.Tech Program of the University

A student who has completed the 1st Year (i.e., passed in all the Courses/Subjects prescribed for the 1st Year) of the B.Tech/B.E./B.S., Four-Year Degree Program from another recognized University, may be permitted to transfer to the 2nd Year (3rd Semester) of the B.Tech Program of the University as per the rules and guidelines prescribed in the following Sub-Clauses:

14.5.1 The concerned student fulfils the criteria specified in Sub-Clauses 2.3.1, 2.3.2 and 2.3.3.

14.5.2 The student shall submit the Application for Transfer along with a non-refundable Application Fee (as prescribed by the University from time to time) to the University no later than July 10 of the concerned year for admission to the 2nd Year (3rd Semester) B.Tech Program commencing on August 1 on the year concerned.

14.5.3 The student shall submit copies of the respective Marks Cards/ Grade Sheets/ Certificates along with the Application for Transfer

14.5.4 The transfer may be provided on the condition that the Courses and Credits completed by the concerned student in the 1st Year of the B.Tech/B.E./B.S. Four Degree Program from the concerned University, are declared equivalent and acceptable by a Committee constituted by the Vice Chancellor for this purpose. Further, the Committee may also prescribe the Courses and Credits the concerned students shall have to mandatorily complete, if admitted to the 2nd Year of the B.Tech Program of the University.

14.5.5 The Branch/Discipline allotted to the student concerned shall be the decision of the University and binding on the student.

14.6 **Change of Branch/Discipline**

A student admitted to a particular Branch of the B.Tech Program will normally continue studying in that Branch till the completion of the program. However, the University reserves the right to provide the option for a change of Branch, or not to provide the option for a change of Branch, at the end of 1st Year of the B.Tech Program to eligible students in accordance with the following rules and guidelines: framed by the University from time to time.

14.6.1 Normally, only those students, who have passed all the Courses prescribed for the 1st Year of the B.Tech Program and obtained a CGPA of not less than 6.00 at the end of the 2nd Semester, shall be eligible for consideration for a change of Branch.

14.6.2 Change of Branch, if provided, shall be made effective from the commencement of the 3rd Semester of the B.Tech Program. There shall be no provision for change of Branch thereafter under any circumstances whatsoever.

14.6.3 The student provided with the change of Branch shall fully adhere to and comply with the Program Regulations of the concerned Branch of the B.Tech Program, the Fee Policy pertaining to that Branch of the B.Tech Program, and, all other rules pertaining to the changed Branch existing at the time.

14.6.4 Change of Branch once made shall be final and binding on the student. No student shall be permitted, under any circumstances, to refuse the change of Branch offered.

14.6.5 The eligible student may be allowed a change in Branch, strictly in order of *inter se* merit, subject to the conditions given below:

14.6.5.1 The actual number of students in the third Semester in any particular Branch to which the transfer is to be made, should not exceed the intake fixed by the University for the concerned Branch; and,

14.6.5.2 The actual number of students in any Branch from which transfer is being sought does not fall below 75% of the total intake fixed by the University for the concerned Branch.

14.6.6 The process of change of Branch shall be completed within the first five days of Registration for the 3rd Semester of the B.Tech Program.

14.7 **Professional Practice Courses**

Professional Practice Courses (Professional Practice – I and Professional Practice – II) are practice based Courses with the objective to equip students with the skills of problem identification, root cause analysis and problem solving, innovation and design thinking through industry exposure and project based learning. The expected outcomes are first level proficiency in problem solving and design thinking skills to better equip B.Tech graduates for their professional careers.

The method of evaluation and grading for the Professional Practice Courses shall be prescribed and approved by the concerned Departmental Academic Committee (refer Annexure A of the Academic Regulations, 2017). The same shall be prescribed in the Course Handout.

14.8 **Professional Practice – I**

Professional Practice – I is a 5 Credit Course. This first level practice based course is conducted after the 4th Semester of the B.Tech Program, during the summer break (usually June – July), in accordance with the following options and guidelines:

14.8.1 *Internship Program in an Industry/Company:*

A student may undergo an Internship Program for a period of 6 – 8 weeks in an industry/company, subject to the following conditions:

14.8.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

14.8.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, and any other qualifying criteria) as applicable/stipulated by the concerned Industry/Company for award of the Internship to a student;

14.8.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of internships shall be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfills the criteria, as applicable, specified by the Industry/Company providing the Internship, as stated in Sub-Clause 2.8.1.2 above.

14.8.1.4 A student may opt for Internship in an Industry/Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

14.8.1.5 A student selected for an Internship in an industry/company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

14.8.2 *Project Work:*

A student may opt to do a Project Work in an Industry/Company/Research Laboratory or the University Department(s), subject to the following conditions:

14.8.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

14.8.2.2 The student may do the project work in an Industry/Company/Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.8.2.1). Provided further, that the Industry/Company/Research Laboratory offering such project work confirms to the University that the project work will be conducted in accordance with the Program Regulations and requirements of the University.

14.9 *Professional* **Practice – II**

Professional Practice - II is an intensive practice based course with 15 Credits offered during the final (4th) year of the B.Tech Program. Students may register for Professional Practice – II in either the 7th Semester or the 8th Semester of the B.Tech Program, in accordance with the following guidelines:

14.9.1 *Internship Program in an Industry/Company:*

A student may undergo an Internship Program for a period of about 15 weeks in an Industry/Company, subject to the following conditions:

14.9.1.1 The Internship Program shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

14.9.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, any other qualifying criteria) as applicable/stipulated by the concerned Industry/Company for award of Internship to a student;

14.9.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of Internships will be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfills the criteria, as applicable, specified by the Industry/Company providing the Internship, as stated in Sub-Clause 2.9.1.2 above.

14.9.1.4 A student may opt for Internship in an Industry/Company of her/his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her/his own. Provided further, that the Industry/Company offering such Internship confirms to the University that the Internship program shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

14.9.1.5 A student selected/awarded an Internship Program in an Industry/ Company shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

14.9.2 *Project Work and Dissertation:*

A student may do an extensive Project Work (with a Dissertation) in an Industry/Company/Research Laboratory or the University Department(s), subject to the following conditions:

14.9.2.1 The Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

14.9.2.2 The student may do the Project Work in an Industry/Company/Research Laboratory of her/his choice subject to the above mentioned condition (Sub-Clause 2.9.2.1). Provided further, that the Industry/Company/Research Laboratory offering such project work confirms to the University that the Project Work will be conducted in accordance with the Program Regulations and requirements of the University.

14.10 **University Learning Courses**

The objective of a University Learning Course (ULC) is to sensitize and inculcate commitment to social and environmental issues and make a contribution through service and experiential learning. The outcome is to produce graduates who are sensitized and committed to serving the social and environmental needs of society.

The ULC is a 1- Credit Course coordinated by the parent Department or a group of Departments and the student is required to complete this course ideally during any of the Semesters of the 2nd or 3rd Year of the B.Tech Program. The nature and details of the ULC shall be approved by the concerned Departmental Academic Committee (DAC). As per the Academic Regulations, the 'S' grade is awarded for "satisfactory completion" of the Course and 'NC' grade is awarded for "non-completion" of the Course. The student who receives the "NC" grade shall repeat the ULC (it may be another type of ULC as approved by the concerned DAC) until the concerned student secures the "S" grade in the ULC. The "S" and "NC" grades do not carry grade points and hence not included in the SGPA, CGPA computations.

14.11 **Open Electives**

Open Electives are Courses offered by any Department/School of the University. The primary objective of offering Open Electives is to provide interdisciplinary/ trans disciplinary learning experiences. The outcome is a graduate with a fair exposure to disciplines beyond the chosen Branch in the B.Tech Program.
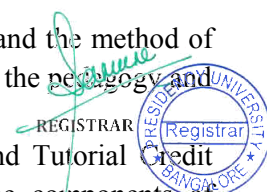
Open Electives offered by any Department/School of the University are listed in the Course Structure under the Open Elective category and offered to students of any Department including the parent Department/School.

The Course details and method of evaluation shall be clearly prescribed in the concerned Course Handout.

14.12 **Specific Regulations regarding Assessment and Evaluation**

The components of continuous assessments, weightage for each component and the method of evaluation shall be assigned considering the nature of the Courses in terms of the pedagogy and outcomes.

14.12.1 Normally, for the Courses that have only the Lecture and Tutorial Credit Structure(L – T – 0), with no Practical component, the components of Continuous Assessment and the distribution of weightage among the components of continuous assessment and duration of the examination/assessment shall be as detailed in the Table 2.12.1 below:

Table 2.12.1		
Method of Assessment for Courses with Credit Structure (L –T – 0)		
Components of Continuous Assessments	**Weightage (% of Total Marks)**	**Duration of Assessment**
1. Test 1	20%	1 hour
2. Test 2	20%	1 hour
3. Assignments, Quiz, or any other assessment as prescribed in the concerned Course Handout.	20%	NA
4. End Term Final Examinations	40%	2 or 3 hours
Total	**100%**	
Note: An additional Test 3 may be conducted as an optional test to allow for improvement. If a student opts for Test 3, then the higher marks obtained in any two tests shall be considered for evaluation.		

14.12.2 Normally, for Practical Courses that have only the Practical Credit Structure (0 – 0 – P), or Practical Courses with a Credit Structure (L – 0 – P), the components of continuous assessment and the distribution of weightage among the components of continuous assessment and duration of the examination/assessment is detailed in the Table 2.12.2 below:

Table 2.12.2		
Method of Assessment for Practical Courses with Credit Structure (0 –0 – P) / (L – 0 – P)		
Components of Continuous Assessments	**Weightage (%of Total Marks)**	**Duration of Assessment**
1. Laboratory/Practical Exercise conducted in every Practical Class and Laboratory Records, Practical/Project Reports as prescribed by the Course Handout.	50%	NA
2. Practical Test/Viva/Quiz/Assignments as prescribed by the Course Handout.	20%	NA
3. End Term Final Practical Examinations	30%	2 hours
Total	**100%**	

14.12.3 Normally, for Practice/Skill based Courses, like Personal and Professional Skills/ Business Skills (as prescribed in the Program Curriculum) with a Credit Structure(0 – 0 – P) or (L – 0 – P), or a Project/Internship/Skill Based Course, and University Learning Courses, with no typical Credit Structure (as defined in Clause 5.2 of the Academic Regulations, 2017), the components of Continuous Assessment and the distribution of weightage among the components of continuous assessment, and the method of evaluation/assessment, shall be prescribed in the concerned Course Handout. There shall be no component of End Term Final Examinations for such Courses.

14.12.4 In case any exception is required for a particular Course, where the methods of assessment prescribed in the specific regulations mentioned above in Sub-Clauses 2.12.1, 2.12.2 and 2.12.3 are not suitable/relevant for the assessing the performance in the concerned Course, the BOS shall recommend the appropriate method of assessment for approval of the Academic Council.

14.13 Course Handout

The Course Handout (Refer Clause 6.2 of the Academic Regulations, 2017) is a comprehensive document describing the Objectives/Outcomes of the Course, the detailed syllabus (with the prescribed Text Book(s) and Reference Material), the Lesson/Session-wise Plan, and all the relevant and necessary details regarding the pedagogy, expectation from the students regarding preparation, participation and self-learning, components of continuous assessment and respective weightage (in percentage (%) of the total marks of all components of assessment) given to the components, and the method of evaluation. The guidelines for preparation of the Course Handout, its approval and delivery are listed in the following Sub-Clauses:

14.13.1 Normally the Course Handout is prepared by the Course Instructor(s) assigned to teach the Course. In cases of multiple sections of students registered for the same Course, an Instructor In-Charge, assigned by the DAC, shall prepare the Course Handout in consultation with the other Course Instructors assigned to the concerned Course.

14.13.2 The DAC shall examine each Course Handout and arrange for necessary deliberations as required. On acceptance of the completeness and quality of the Course Handout, the DAC shall approve the Course Handout.

14.13.3 A consolidated printed/soft copy of the Booklet of all Course Handouts corresponding to the concerned Semester of a particular Program of Study shall be provided to every student concerned on the first day/Registration day of the concerned Semester.

14.13.4 The Course Handout Booklet is a very important guide for the students registered in the concerned course. The students are expected to use the Course Handout Booklet to prepare regularly and benefit from each session (lecture/tutorial/practical) of the Course(s) and perform well in the continuous assessments and End Term Final Examination, as applicable. Every student shall read and adhere to all the guidelines prescribed in the Course Handout Booklet.

REGISTRAR

Registrar
PRESIDENCY UNIVERSITY
BANGALORE

15.0   PART B:

BACHELOR OF TECHNOLOGY DEGREE PROGRAM IN ELECTRONICS & COMMUNICATIONS ENGINEERING B.TECH (ELECTRONICS & COMMUNICATIONS ENGINEERING) 2015-2019

### 15.1   PROGRAM CURRICULUM

15.1.1 Mandatory Courses and Credits

The B.Tech (Electronics and Communication Engineering) Program structure (2015-2019) consists of 54 Courses totalling 183 credits.

Table 3.1.1 summarizes the type of Courses, number of Courses under each type and the associated credits. that are mandatorily required for the completion of the Degree.

S. No	TYPE OF COURSES	NO. OF COURSES	CREDITS
	TABLE 3.1.1 **B.Tech (Electronics and Communication Engineering) 2015-2019:** **Mandatory Courses and Credits**		
1	Humanities, Social Sciences and Management Sciences(HS)	7	20
2	Basic Sciences (BS)	8	27
3	Engineering Sciences (ES)	5	18
4	Core (Professional) Course (CC)	24	77
5	Discipline(Professional) Elective (DE)	4	12
6	Open Elective (OE)	2	6
7	Industrial Practice (IP)	1	5
8	Industrial Practice and Project (IPP)	1	15
9	Personality Development Skills (PDS)	1	2
10	University Learning Courses (ULC)	1	1
	TOTAL	**54**	**183**
	The mandatory minimum credits required for the award of the B.Tech (Electronics and Communication Engineering**) Degree is 183 Credits**		
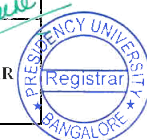
The Table-3.1.1 is indicative of various components such as Foundation Courses (Basic Sciences, Engineering Sciences, Humanities, Social Sciences and Management Sciences), Professional Core, Discipline and Open Elective Courses. The unique feature of this Program is Industrial Practice of 6-8 weeks during the end of 4th Semester and before the commencement of 5th Semester for the student to have industry exposure. The Industrial Practice and Project (IPP) will be during their 7th / 8th Semester for about 15 weeks. University Learning Course, which is mandatory, is introduced in the curriculum for the student to give value of social service such as community service, clean and green, NSS, protection of environment and health hazards, etc.

Table-1 lists the mandatory Courses, type of Courses, number of type of Courses and the associated credits required for the completion of the B. (Electronics and Communication Engineering) Program.

15.1.2 B.Tech (Electronics and Communication Engineering) Program Year Wise Structure

First Year			Second Year			Third Year			Fourth Year	
Sem. 1	Sem. 2	Summer Term	Sem.3	Sem. 4	Summer Term/IP-1	Sem. 5	Sem. 6	Summer Term	Sem. 7	Sem. 8
BS-5 ES-1 HS-1	BS-2 ES-4 HS-2		BS-1 HS-1 CC-5	HS-1 CC-5 PDS-1		CC-5 HS-1 DE-1 ULC-1	CC-6 HS-1 DE-1		CC-3 DE-1 OE-1	DE-1 OE-1 IPP-1
									DE-1 OE-1 IPP-1	CC-3 DE-1 OE-1

Mandatory Minimum Credits required for the award of the
B.Tech (Electronics and Communication Engineering)
Degree: 183

Nomenclature:

BS - Basic Sciences

ES - Engineering Sciences

HS – Humanities, Social Sciences and Management Sciences

CC - Core Course

DE - Discipline/Professional Electives

OE - Open Electives

IP - Industrial Practice

IPP - Industrial Practice and Project

PDS-Personal Development Skills

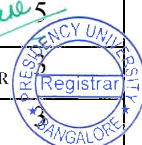ULC - University Learning Course

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In the entire program, the practical and skill based course component contribute to an extent of approximately 30% out of the total credits of 183 for B.Tech (Electronics and Communication Engineering) program of four years duration.
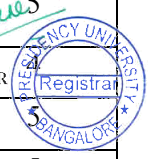
15.2 **PROGRAM STRUCTURE**

		I SEMESTER					
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	MATH A 101	Engineering Mathematics - I	3	1	0	4	4
2	MATH A 103	Probability and Statistics	3	1	0	4	4
3	ENG A 101	English	3	0	2	4	5
4	CHE A 101	Engineering Chemistry	3	0	0	3	3
5	PHY A 101	Engineering Physics	3	0	0	3	3
6	BIO A 101	General Biology	3	0	0	3	3
7	ME A 101	Engineering Graphics	3	0	2	4	5
		TOTAL	21	2	4	25	27

		II SEMESTER					
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	MATH A 102	Engineering Mathematics – II	3	1	0	4	4
2	ENG A 102	Technical Report Writing	3	0	0	3	3
3	ME A 104	Workshop Practice	3	0	2	4	5
4	ME A 104	Thermodynamics	3	0	0	3	3
5	COE A 102	Computer Programming	3	0	2	4	5
6	EEE A 102	Electrical Sciences	3	0	0	3	3
7	PUE A102	Science Lab	0	0	3	2	3
8	PUE A 106	Introduction to University Academic Processes	1	0	0	1	1
		TOTAL	19	1	7	24	27

III SEMESTER

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	MATHS A 203	Complex Variables and Transforms	3	1	0	4	4
2	PUE A 201	Environmental Science	3	0	0	3	3
3	ECE A 201	Electromagnetic Theory	3	1	0	4	4
4	ECE A 203	Digital Design	3	0	2	4	5
5	ECE A 205	Electrical Machines	3	0	2	4	5
6	ECE A 207	Electronic Devices	3	1	0	4	4
7	ECE A 209	Computer Aided Design for Electronics and Communication Engineers	1	0	6	4	7
		TOTAL	19	3	10	27	32

IV SEMESTER

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
1	ECE A 202	Signals and Systems	3	1	0	4	4
2	ECE A 204	Microprocessor Programming and Interfacing	3	0	2	4	5
3	ECE A 206	Control Systems	3	1	0	4	
4	ECE A 208	Electromechanical Energy Conversion	3	0	2	4	
5	ECE A 210	Analog Electronics	3	0	2	4	5
6	PUE A 206 / PUE A 212	Humanities Elective – I	3	0	0	3	3

7	PUE A 202	Professional Development Skills – I	2	0	0	2	2
		TOTAL	**20**	**2**	**6**	**25**	28

		SUMMER TERM					
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	IP	Industrial Practice	-	-	-	5	
		TOTAL	19	2	6	5	

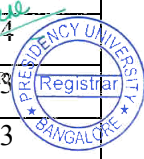|		V SEMESTER					
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	ECE 209	Electrical and Electronic Measurements and Instrumentation	4	0	0	4	4
2	ECE 210	Analog Communication	4	0	0	4	4
3	ECE 211	Transmission Lines and Waveguides	3	0	0	3	3
4	ECE 3XX	Discipline Elective – I	3	0	0	3	3
5	MGT 111	Entrepreneurship	3	0	0	3	3
6	ECE 257	Electrical and Electronic Measurements and Instrumentation Lab	0	0	2	1	2
7	ECE 258	Analog Communication Lab	0	0	2	1	2
8	ULC 101	University Learning Course*	0	0	0	1	

S.NO.	COURSE CODE	COURSE NAME	L	T	P	CREDITS	CONTACT HOURS
9	IPP 101	Industrial Practice and Project				5	
		TOTAL	17	0	4	24/25	21

* Student has to register for university learning Courses in any one semester 5 / 6 to earn the mandatory credits.

		VI SEMESTER					
S.NO.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	ECE 212	Digital Communication	3	1	0	4	4
2	ECE 213	Digital Signal Processing	3	1	0	4	4
3	ECE 214	Antenna and Microwave Engineering	4	0	0	4	4
4	MGT 112	Engineering Economics	3	0	0	3	3
5	ECE 3XX	Discipline Elective – II	3	0	0	3	3
6	ECE 259	Digital Communication Lab	0	0	2	1	2
7	ECE 260	Digital Signal Processing Lab	0	0	2	1	2
8	ECE 261	Antenna And Microwave Engineering Lab	0	0	2	1	2
9	ULC 101	University Learning Course *	0	0	0	1	
		TOTAL	16	2	6	21/22	24

		VII SEMESTER					
S. No.	**COURSE CODE**	**COURSE NAME**	**CREDIT STRUCTURE**				**CONTACT HOURS**
			L	**T**	**P**	**CREDITS**	
1	ECE 215	VLSI Design	4	0	0	4	4
2	ECE 216	Information Theory and Coding	4	0	0	4	4
3	ECE 3XX	Discipline Elective – III	3	0	0	3	3
4	ECE 4XX	Open Elective-I	3	0	0	3	3
5	ECE 262	VLSI Design Lab	0	0	2	1	2
		TOTAL	14	0	2	15	16

S. No.	COURSE CODE	COURSE NAME	CREDIT STRUCTURE				CONTACT HOURS
			L	T	P	CREDITS	
		VIII SEMESTER					
1	ECE 3XX	Discipline Elective - IV	3	0	0	3	3
2	ECE 4XX	Open Elective - II	3	0	0	3	3
3	IPP 2	Industrial Practice and Project				15	
		TOTAL	6	0	0	21	6

REGISTRAR