



**SCHOOL OF ENGINEERING AND TECHNOLOGY  
SRI PADMAVATI MAHILA VISVAVIDYALAYAM  
TIRUPATI – 517 502**

**B. Tech Degree Programme (CBCS) Regulations-2019 (Revised)  
(For Regular and Lateral Entry Students)**

*(To come into effect from the batch admitted in academic year 2019-2020)*

**CHOICE-BASED CREDIT SYSTEM (CBCS)**

(In accordance with AICTE Model Curriculum)

**1. PREAMBLE**

B.Tech Degree Programme offered by the School of Engineering and Technology has duration of four academic years with each academic year being divided into two consecutive semesters. The academic year starts usually in June/July of every year with an odd semester followed by an even semester in December/January. Choice-Based Credit System (CBCS) is a flexible system of learning and enables students choose elective courses from a large pool of prescribed elective courses. The electives prescribed may be from the Department offering the Programme or from other Departments. Provision also exists for choosing open electives. For every course, learning objectives and learning outcomes are defined following a systematic procedure. A course comprises of lectures/tutorials/laboratory work/field work/project work/viva/seminars/ assignments /presentations/self-study, etc. or a combination of some of these. Under the CBCS, every course has certain weight defined in terms of the number of credits. The requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

**2. MINIMUM QUALIFICATION FOR ADMISSION INTO B.TECH PROGRAMME**

A pass in intermediate examination conducted by the Board of intermediate examination of Andhra Pradesh with Mathematics, Physics and Chemistry as compulsory subjects or any equivalent examination recognized by Sri Padmavati Mahila Visva Vidyalayam and obtained at least 45% marks (40% in case of SC/ST Students) in the above subjects taken together. Students with Diploma Qualification from an AICTE approved institution with at least 45% (40% in case of SC/ST Students) can also be admitted into II Year B.Tech in respective branches and are referred as Lateral Entry Students (LES).

**3. BRANCHES OF STUDY**

The branches of study in B.Tech degree programme currently offered are:

- Computer Science and Engineering (Code: 71)
- Electronics and Communication Engineering (Code: 72)
- Electrical and Electronics Engineering (Code: 75)
- Mechanical Engineering (Code: 76)

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#### 4. SEMESTER

Generally, each semester shall consist of 18 weeks with a typical academic work of 30 hours/week, equivalent to 90 actual instruction days. However, instructional days may be reduced up to 72 per semester with increased instructional hours per week, if required.

#### 5. CREDIT DEFINITION

It is a unit by which the course work is measured. It determines the number of hours of instructions required per week per semester. The following definitions are adopted:

<b>Lecture/Tutorial</b>	-	<b>1 hour/week = 1 Credit</b>
<b>Practical</b>	-	<b>2 hours/week = 1 Credit</b>

6. A Course comprises of one or more credits depending on the quantum of syllabus to be covered in the course. A B.Tech programme comprises of basic courses (basic sciences and engineering sciences), core courses and elective courses (professional electives and open electives).

#### 7. COURSE REGISTRATION

Every student has to register for the set of Courses offered by the Department in that Semester including those of Open Elective course offered by other Departments and MOOC courses with the total number of their Credits being limited by considering the permissible weekly contact hours (typically:30/Week). Audit/Mandatory courses are over and above these courses/credits.

#### 8. CREDITS REQUIRED FOR THE AWARD OF DEGREE

A student shall become eligible for the award of B.Tech degree, if the student earns a minimum of 160 (120 credits for lateral entry students) credits by passing all the basic, core and elective courses along with practical courses prescribed for the B. Tech programme.

- 8.1. A student can do more than 160 credits and the best 160 credits will be considered for CGPA.
- 8.2. It is mandatory for a student to complete successfully all the basic and core courses pertaining to her branch of study.
- 8.3. A student shall choose elective courses from the list of elective courses prescribed by the department pertaining to her branch of study. Further, she may choose elective courses offered by other engineering departments or on MOOCs platform. For every programme, the list of elective courses may be divided into the following types:
  - 8.3.1. **Professional Electives** prescribed by the department – The courses being offered as electives by the department or the courses on MOOCs platform.
  - 8.3.2. **Open Electives** – The courses offered by other departments
- 8.4. Every student is required to take certain prescribed minimum number of professional electives and open electives.
- 8.5. In addition to the above, a student is required to complete the prescribed mandatory courses. There are no credits assigned for the mandatory courses.

- 8.6. A student may audit a course of her interest with the permission of the teacher concerned. However, such credits are not considered as a part of the mandatory credits.

## 9. SCHEME OF INSTRUCTION

The various courses to be studied semester wise and the corresponding syllabus along with the credits are indicated in the scheme of instruction.

- 9.1. The Joint-Board of Studies (JBoS) shall formulate the scheme of instruction and examinations, and detailed syllabi for the first and second semesters for all the branches of study.
- 9.2. The Pass Board of Studies (PBoS) of each Department shall formulate the scheme of instruction and examinations, and detailed syllabi for the subsequent six semesters of B.Tech Programme taking into account of the credits offered in the first and second semesters. The detailed syllabus of each theory course shall be organized into five units of equal weight.

## 10. COURSE CODING SCHEME

Each course code is denoted by seven alpha-numerals.

First two digits indicates the year of introduction of Regulations	19
Code of the department offering the Course	CS: Computer Science and Engineering EC: Electronics and Communication Engineering EE: Electrical and Electronics Engineering ME: Mechanical Engineering BS: Basic Sciences and Humanities
Nature of course	T: Theory P: Practical J: Project Work S: Seminar I: Internship M: MOOCs
Course Number	01, 02, ...

## 11. STRUCTURE OF CURRICULUM

Curriculum should consist of a good mix of Basic, Core and Elective courses. The break-up of various types of courses and percentage of credits offered are shown in below table.

Practicals include Laboratory/Drawing/Workshop practice/Seminars/Project Work

Theory Courses	70% – 75%
Practical Courses	25% - 30%

S.No	Broad Course Classification	Course Group/Category	Course Description	Range of Credits & AICTE Model Credits
1	Basic Courses (BC)	BS-Basic Sciences	Include-Mathematics, Physics, Chemistry courses	10% - 15%
2		ES-Engineering Sciences	Include Fundamental engineering courses	15% - 20%
3		HS-Humanities, Social Sciences and Management	Include courses related to Humanities, Social Sciences and Management	8% - 10%
4	Core Courses (CoC)	PC-Professional Core	Include core courses related to the concerned Department /Branch of Engineering.	30% - 40%
5	Elective Courses (EIC)	PE-Professional Electives	Include Elective courses related to the concerned Department /Branch of Engineering.	10% - 15%
6		OE-Open Electives	Elective courses include courses from other technical and /or Emerging Subject Areas	5% - 10%
7	Projects Related Courses (PW)	Project Work	B.Tech project or UG Project (Phase – I & Phase – II)	5% - 10%
8		Seminar	Seminar based on core contents related to concerned Department/Branch of Engineering.	
9	Mandatory Courses	MC	Mandatory Courses	Non-Credit
10	Additional Courses	ONLINE Courses	Offered by IITs/MOOCs	Optional
Total Credits for UG (B.Tech) Programme				160

## 12. DURATION OF THE PROGRAMME

Minimum duration for the completion of the programme is 4 years and the maximum duration is 8 years, while it is 3 years and 6 years for lateral entry students respectively.

## 13. ATTENDANCE REQUIREMENTS

13.1. A student is required to complete the study of B.Tech Programme satisfying the attendance requirements in all the semesters within a period of eight (six for lateral entry) academic years from the year of admission to become eligible for the award of B.Tech degree failing which she forfeits her seat.

13.2. Normally a student should put in 100% of attendance. However, relaxation may be given up to 25% for attending to personal needs/co-curricular activities (Seminars/Conferences/workshops/hackathon, etc.) and extra-curricular activities (Sports/games/NCC/NSS, etc.)

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- 13.3. A student shall be detained in a semester if she fails to satisfy the attendance requirements as given below.
  - 13.3.1. A student shall attend at least 75 percent of the hours of instruction taken for all the courses put together in that Semester.
  - 13.3.2. A student shall attend at least 50 percent of the hours of instruction for each course.
- 13.4. The principal shall condone the shortage of attendance (for reasons beyond the control of the student, Example: Health reasons) provided she satisfies the clause 13.3.2 and obtains at least 60% of overall attendance for all the courses put together in that semester.
- 13.5. A student who fails to satisfy the attendance requirements specified in clauses 13.3 and 13.4 will be detained and she shall repeat that semester in the subsequent academic years with the written Permission of the Principal subject to the clause 13.1. A Student will not be promoted to the next semester /Year if she is detained in a semester.
- 13.6. A student shall not be permitted to study any semester more than three times during the entire programme of study.
- 13.7. A student who satisfies the attendance requirements specified in either of the clauses 13.3 and 13.4 in any semester may be permitted to repeat that semester by cancelling the previous attendance and sessional marks of that semester with the written permission of the Principal. However, this facility shall not be extended to any student more than twice during the entire programme of study as specified in clause 13.1.
- 13.8. Gap year(s) shall be over and above maximum period of eight (six for lateral entry students) academic years (see clause 21).
- 13.9. Maternity leave shall be granted only once during the entire programme. Such candidates have to put-up a minimum of 45% attendance course-wise and a minimum aggregate of 45%.

#### **14. EVALUATION**

- 14.1. Evaluation for theory courses shall be done on a continuous basis i.e. through Continuous Internal Evaluation (CIE) in the Semester and Semester End Examination (SEE).
  - 14.1.1. Continuous internal evaluation comprises two sessional tests of two hours duration each and at least two assignments. It is mandatory for a student to attend both the sessional tests in each theory course.
    - 14.1.1.1. Sessional Test I shall be held in the middle of the semester i.e. after the completion of 50% of actual instruction days and generally after completing 50% of the syllabus. Sessional Test I will be for 25 marks and 5 marks for first assignment.
    - 14.1.1.2. Sessional Test II shall be held immediately after the completion of instructional days. Sessional Test II will be for 25 marks and 5 marks for second assignment.
  - 14.1.2. Sessional marks for a maximum of 30 shall be awarded based on the performance of the two sessional tests and two assignments. If a student is absent for any of the internal test/assignment for whatsoever reason, the marks for that test/assignment shall be zero. The sessional marks calculation procedure is shown in Table 1.

**Table 1: Sessional marks calculation procedure**

Sessional – I (30 Marks)		Sessional – II (30 Marks)		Internals (30 Marks)	
Test (25 Marks)	Assignment (5 Marks)	Test (25 Marks)	Assignment (5 Marks)	0.8*(max(Sessional – I, Sessional – II)) + 0.2*(min(Sessional – I, Sessional – II))	

- 14.1.3. The Semester end examination shall be conducted by the controller of Examinations. The Semester End Examination will be for 3 hours duration carrying 70 marks which will be conducted by the university. Each external theory paper will have a maximum of 70 marks. A student has to obtain a minimum of 35% i.e., 25 marks out of 70 marks to pass that examination. Also, the student has to obtain a minimum of 40 marks out of 100 (**University examination + sessional marks** put together) to pass in the corresponding paper.
- 14.2. For each practical course except project work, the sessional marks for a maximum of 40 shall be awarded by the teacher concerned based on the continuous assessment of practical work followed by an internal practical examination. The continuous assessment will be for 20 marks and internal practical examination will be for 20 marks.
- 14.3. A Semester End Examination in each Practical course shall be conducted after the last working day of the semester covering the entire syllabus prescribed for that course.
- 14.3.1. A Semester End Examination of 3 hours duration carrying 60 marks will be conducted by the university.
- 14.3.2. The examination shall be held by two teachers: one external examiner and one internal examiner appointed by the Principal. The principal shall appoint the internal examiner nominated by the Head of the Department (HoD) concerned. The Principal shall appoint the external examiner from among the panel of examiners recommended by the BoS, Chairman concerned. The panel of examiners shall be approved by the university.
- 14.3.3. A student has to obtain a minimum of 35% i.e., 21 marks out of 60 marks to pass that examination. Also, the student has to obtain a minimum of 40 Marks out of 100 (**University examination + sessional marks** put together) to pass in the corresponding paper.
- 14.4. The project work shall be carried out in two phases: Phase – I in 7<sup>th</sup> semester and phase - II in 8<sup>th</sup> semester. The evaluation of the project work is carried out as shown in Table 2.

**Table 2: Evaluation process for the project work**

S.No	Course Title	Semester	Credits	Internal Evaluation		External Evaluation	Total
				Guide	Internal Committee	External committee	
1	Project Work Phase – I	7	2	40	60	-	100
2	Project Work Phase – II	8	8	40	-	60	100

The internal committee consists of HoD and two faculty from the corresponding department. The external committee consists of one external examiner and two internal examiners from the corresponding department. The internal examiners shall be the head of the department and the senior faculty. The HoD shall be the chairman and convener of the committee. The Principal shall appoint the external examiner from the panel of

examiners recommended by the BoS, Chairman concerned. The panel of examiners shall be approved by the university.

- 14.5. Evaluation of Seminar shall be done by internal committee of the respective department for 100 marks. HoD and two senior faculty nominated by HoD comprises the internal committee.
- 14.6. As a part of internship program, every student need to take training during semester break period of 2<sup>nd</sup> year 1<sup>st</sup> / 2<sup>nd</sup> semester and 3<sup>rd</sup> year 1<sup>st</sup> semester. The student also needs to go for internship of 4 weeks during 3<sup>rd</sup> year 2<sup>nd</sup> semester break period. Internship evaluation shall be done by the internal committee of the respective department for 100 marks during 4<sup>th</sup> year 1<sup>st</sup> semester for 2 credits. HoD and two senior faculty nominated by HoD comprises the internal committee.
- 14.7. Evaluation of the mandatory courses shall be done by the internal faculty who is teaching the course for 30 marks and 70 marks as attendance percentage. The result shall be given as satisfactory/unsatisfactory in marks memo.
- 14.8. The students shall be permitted to verify the evaluated answer scripts of Sessional tests only.
- 14.9. The evaluation and verification of answer scripts of Sessional Tests shall be completed within a week after the conduct of the Sessional Tests.
- 14.10. The evaluation of Semester End Examination answer scripts shall be arranged by the Controller of Examinations as per the University procedures in vogue.

## **15. MASSIVE OPEN ONLINE COURSE (MOOCS)**

- 15.1. A student has to do at least one MOOC course
- 15.2. MOOC course need to be approved by the corresponding department
- 15.3. If any student fails in MOOCs, the same course can be repeated or any another MOOC can be taken
- 15.4. Only courses in Swayam or NPTEL are permitted
- 15.5. MOOC Course should not be a repetition course from B.Tech curriculum

## **16. QUESTION PAPER SETTING**

- 16.1. All the question papers setting, both for sessional tests and semester end examination shall be generally based on Bloom's Taxonomy.
- 16.2. Model Question Paper for each theory course shall be prepared by the teacher within 30 days from the commencement of the Semester and the same shall be forwarded to the Controller of Examinations through the BOS, Chairman, concerned.
- 16.3. For each theory course, the question paper shall be set by an external paper setter. The BOS, Chairman, shall recommend a panel comprising at least six external paper setters for each theory course to the University. The University shall arrange for setting the question paper by appointing external paper setter from that panel.

## **17. GRADING AND GRADE POINTS**

- 17.1. **Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale
- 17.2. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A, B, C, D, P and F.

- 17.3. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
- 17.4. **Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the cumulative sum of the credits of all courses in all the semesters. It is expressed up to two decimal places.
- 17.5. **Letter Grades and Grade Points:** A 10-point grading system with the following letter grades are to be followed. A Student obtaining Grade F shall be considered failed and will be required to reappear in the examination. For non-credit courses ‘Satisfactory’ or ‘Unsatisfactory’ shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.
- 17.6. To pass course in B.Tech Programme, a student has to secure a minimum Grade of P in End-Semester Examination. A student obtaining Grade F shall be considered failed and will be required to reappear in the examination. A student cannot reappear for the End-Semester Examination in a course in which she has passed to improve the score. Grade, Grade points and equivalent % marks is shown in Table 3.

**Table 3: Grades and Grade Points**

<b>Equivalent % marks</b>	<b>Letter Grade</b>	<b>Grade Point</b>
90-100	O (Outstanding)	10
80-89	A (VERY Good)	9
70-79	B (Good)	8
60-69	C (Above Average)	7
50-59	D(Average)	6
40-49	P (Pass)	5
Below 40	F(Fail)	0
0	AB (Absent)	0

- 17.7. A student who has failed in a course can reappear for the End Semester Examination as and when it is held in the normal course. The Sessional Marks obtained by the student will be carried over for declaring the result. The class attained based on the CGPA is shown in Table 4. Equivalent pass percentage is calculated as  $(CGPA - 0.5) \times 10$

**Table 4: Class attained with respect to CGPA**

<b>CLASS</b>	<b>CGPA</b>
First Class with Distinction	7.5 and Above
First Class	Below 7.5 but not less than 6.5
Second Class	Below 6.5 but not less than 5.5
Pass Class	Below 5.5 but not less than 5.0



## 18. COMPUTATION OF SGPA AND CGPA

18.1. **Average (SGPA) and Cumulative Grade Point Average (CGPA):** The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student.

Sum of the number of credits of all courses undergone by a student in that semester, i.e.

$$SGPA (S_i) = \frac{\sum(C_i \times G_i)}{\sum C_i}$$

where  $C_i$  is the number of credits of the  $i^{\text{th}}$  course and  $G_i$  is the grade point scored by the student in the  $i^{\text{th}}$  course.

The CGPA is also calculated in the same manner considering all the courses undergone by a student over all the semesters of a programme, i.e.

$$CGPA (C_i) = \frac{\sum(C_i \times S_i)}{\sum C_i}$$

Where  $S_i$  is the SGPA of the  $i^{\text{th}}$  semester and  $C_i$  is the total number of credits in that semester. The SGPA and CGPA shall be rounded off to two decimal points and reported in the transcripts.

### 18.2. ILLUSTRATION OF COMPUTATION OF SGPA and CGPA

#### 18.2.1. ILLUSTRATION FOR SGPA

Course	Credit ( $C_i$ )	Grade Letter	Grade Point ( $G_i$ )	Credit Point ( $C_i \times G_i$ )
Course 1	3	A	9	$3 \times 9 = 27$
Course 2	4	B	8	$4 \times 3 = 32$
Course 3	3	B	8	$3 \times 8 = 24$
Course 4	3	O	10	$3 \times 10 = 30$
Course 5	3	C	7	$3 \times 7 = 21$
Course 6	4	C	7	$4 \times 7 = 28$
	<b>20</b>			<b>162</b>

$$SGPA = 162 / 20 = 8.10$$

#### 18.2.2. Illustration for CGPA

Semester	Credit, $C_i$	SGPA, $S_i$	(Credit, $C_i$ ) $\times$ (SGPA, $S_i$ )
Semester 1	21	6.94	145.74
Semester 2	20	7.60	152.00
Semester 3	21	7.20	151.20
Semester 4	21	6.85	143.85
Semester 5	20	7.12	142.40
Semester 6	20	7.42	148.40
Semester 7	20	7.36	147.72
Semester 8	17	7.90	134.30
	160		1165.61

$$\text{CGPA} = 1165.61/160 = 7.28$$

## **19. RANKING AND AWARD OF PRIZES/MEDALS**

- 19.1. Ranks shall be awarded in each branch of study on the basis of **Cumulative Grade Point Average (CGPA)** for top ten percent of the students or top three students whichever is higher.
- 19.2. The students who have become eligible for the award of B.Tech degree by passing regularly all the eight (six for lateral entry students) Semesters shall only be considered for the award of ranks.
- 19.3. Award of prizes, scholarships and other honours shall be according to the rank secured by the student as said above and in conformity with the desire of the Donor.

## **20. CONDITIONS OF PROMOTION**

A student shall be eligible for promotion to the next semester of B.Tech Programme provided she satisfies the attendance requirements in the immediately preceding semester as Specified in clause 13.

## **21. GAP YEAR**

The concept of Student Entrepreneur in Residence i.e. Gap Year shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after completing II year of study and at any time of an academic year to pursue full time entrepreneurship. A committee shall be constituted to evaluate the proposal submitted by the student and the committee shall decide on permitting the student for having the Gap Year. Students will be permitted to rejoin into the succeeding year/ from the date of commencement of class work and will be under the academic regulations in force at that time. Gap year may be extended by another year (i.e. a total of two years) and will not be counted for the maximum period of eight (six for lateral entry students) academic years.

## **22. TRANSITORY REGULATIONS**

- 22.1. A student who has been detained in any semester of previous regulations for not satisfying the attendance requirements shall be permitted to join in the corresponding semester of this regulation provided the clauses 13.1 and 13.6 hold good.
- 22.2. End-semester Examinations in each course under the regulations that precede immediately these regulations shall be conducted three times after the conduct of last regular examination under those regulations. Thereafter, the failed students, if any, shall take examination in the equivalent papers of these regulations as suggested by the Chairman, BOS concerned.

## **23. AMENDMENT TO REGULATIONS**

Sri Padmavati Mahila Visvavidyalayam reserves the right to amend these regulations at any time in future without any notice. Further, the interpretation of any of the clause of these regulations entirely rests with university.