SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Approved by AICTE | Accredited by NAAC with 'A' Grade | Accredited by NBA

(CSE, ECE & EEE) | Permanently Affiliated to JNTUA)

Karakambadi Road, Tirupati - 517 507

B.TECH - ACADEMIC REGULATIONS - R20

B.Tech Regular Four Year Degree Programme

(For the batches admitted from the academic year 2020-21) and

B.Tech (Lateral Entry Scheme)

(For the batches admitted from the academic year 2021-22)

PRELIMINARY DEFINITIONS AND NOMENCLATURE

AICTE: Means All India Council for Technical Education, New Delhi.

Autonomous Institute: Means an institute designated as Autonomous by University Grants Commission (UGC), New Delhi in concurrence with affiliating University (**Jawaharlal Nehru Technological University Anantapur**).

Academic Autonomy: Means freedom to an institute in all aspects of conducting its academic programmes granted by UGC for promoting excellence.

Academic Council: The Academic Council is the highest academic body of the institute and is responsible for the maintenance of standards of instruction, education and examination within the institute. Academic Council is an authority as per UGC regulations and it has the right to take decisions on all academic matters including academic research.

Academic Year: It is the period necessary to complete an actual course of study within a year. It comprises two main semesters i.e., one odd and one even.

Branch: Means specialization in a programme like B.Tech degree programme in Civil Engineering, B.Tech degree programme in Computer Science and Engineering etc.

Board of Studies (BOS): BOS is an authority as defined in UGC regulations, constituted by Head of the Organization for each of the departments separately. They are responsible for curriculum design and updation in respect of all the programmes offered by a department.

Backlog Course: A course is considered to be a backlog course, if the student has obtained a failure grade in that course.

Commission: Means University Grants Commission (UGC), New Delhi.

Choice Based Credit System: It provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching along with provision of choice for the student in the course selection.

Certificate Course: It is a course that makes a student to have hands-on expertise and skills required for holistic development in a specific area/field.

Internal Examination: It is an examination conducted towards sessional assessment.

Core: The courses that are the essential constituents of each engineering discipline are categorized as professional core courses for that discipline.

Course: A course is a subject offered by a department for learning in a particular semester.

Course Outcomes: The essential skills that need to be acquired by every student through a course.

Credit: A credit is a unit that gives weight to the value, level or time requirements of an academic course. The number of 'Contact Hours' in a week of a particular course determines its credit value.

Credit Point: It is the product of grade point and number of credits for a course.

Cumulative Grade Point Average (CGPA): It is a measure of cumulative performance of a student overall the completed semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

Curriculum: Curriculum incorporates the planned interaction of students with instructional content, materials & resources.

Department: An academic entity that conducts relevant curricular and co-curricular activities, involving both teaching and non-teaching staff, and other resources in the process of study for a degree.

Detention in a Semester: Student who does not obtain minimum prescribed attendance in a Semester shall be detained in that particular Semester. A Student can

also be detained for lack of required number of credits at the end of IV semester or VI semester respectively.

Elective Course: A course that can be chosen from a set of courses. An elective can be Professional Elective and/or Open Elective.

Evaluation: Evaluation is the process of judging the academic performance of the student in her/his courses. It is done through a combination of continuous internal examinations and semester end examinations.

Grade: It is an index of the performance of the students in a said course. Grades are indicated by alphabets.

Grade Point: It is a numerical weight allotted to each letter grade on a 10 - point scale.

Institute: Represents Sri Venkateswara College of Engineering, Tirupati unless indicated otherwise by the context.

Massive Open Online Courses (MOOC): MOOCs inculcate the habit of self-learning. MOOCs would be additional choices in all the elective group courses.

Minor: Minor are coherent sequences of courses which may be taken in addition to the courses required for the B.Tech degree.

Pre-requisite: A specific course or subject, the knowledge of which is required to complete before student register another course at the next grade level.

Professional Elective: It indicates a course that is discipline centric. An appropriate choice of minimum number of such electives as specified in the programme will lead to a degree with specialization.

Programme: Denotes UG degree programme: Bachelor of Technology (B.Tech).

Project work: It is a design or research-based work to be taken up by a student during his/her VIII semester to achieve a particular aim. It is a credit-based course and is to be planned carefully by the student.

Registration: Process of enrolling into a set of courses in a semester of a programme.

Regulations: The regulations, common to all B.Tech programmes offered by Institute, are designated as "SVCE – R20" and are binding on all the stakeholders.

Semester: It is a period of study consisting of 90 working days. Odd semester commences usually in July and even semester in December of every year.

Semester End Examinations: It is an examination conducted for all courses offered in a semester at the end of the semester.

University: Represents Jawaharlal Nehru Technological University Anantapur (JNTUA), Ananthapuramu.

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1 General

1.1 About the College

Sri Venkateswara College of Engineering (SVCE) is a part of **SV Colleges** group established in the year 2007 with a vision to become a leader in providing quality educational services.

College is affiliated to JNTUA & approved by AICTE, recognized under section 2(f) & 12 (B) of UGC act 1956. Accredited by NAAC with A grade. Three B.Tech Programmes CSE, ECE & EEE are accredited by NBA New Delhi. The Campus is equipped with state of art laboratories of centre of excellence through advanced tools and technologies.

Learning at **Sri Venkateswara College of Engineering** has a pragmatic approach with a clear focus, valuing individual vision, intellectual discipline, and a sense of teamwork. We aim at developing our students to their full potential, preparing them to take the next step towards career success.

Sri Venkateswara College of Engineering is committed to its role in creating leaders through its innovative programmes, outstanding faculty and effective leadership. **Sri Venkateswara College of Engineering** nurtures global leaders who can speak their minds and work well with others in a wide range of cultural contexts. It will develop their ability to manage a career successfully in the global economy.

Our teaching modes and methods of assessment vary between courses to ensure that you gain the most benefit from the interactive course content, faculty members, fellow students, and invited guests. Lectures comprise only a portion of course delivery, with the remaining taken up by discussions, seminars, case analysis, simulation, individual and group projects, and presentations.

1.1.1 Applicability

All the rules specified herein, approved by the Academic Council, shall be in force and applicable to students admitted from the academic year 2020 – 21 onwards. Any reference to "College" in these rules and regulations stands for Sri Venkateswara College of Engineering.

1.1.2 Extent

All the rules and regulations, specified hereinafter shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. It shall be ratified by the Academic Council in the

forthcoming meeting. As per the requirements of statutory bodies, Principal, **Sri Venkateswara College of Engineering** shall be the Chairman, Academic Council.

1.2 Vision & Mission

VISION

To be a centre of excellence focusing on high quality technical education, research and technical services with global leadership competence to succeed in employment and higher education with ethical, social, entrepreneurial aspects updating to the real time requirements.

MISSION

To impart high quality technical education by providing the state-of-the art infrastructure, core instruction. Advanced research and technical consultancy services are carried with qualified and senior faculty to prepare the students professionally deft and intellectually adept possessing excellent skill, knowledge and behaviour with global competence.

1.3 Programmes Offered

Following programmes are offered in various branches at **Sri Venkateswara College of Engineering** leading to the award of B.Tech Degree

S No	Branch
1	Civil Engineering
2	Electrical and Electronics Engineering
3	Mechanical Engineering
4	Electronics and Communication Engineering
5	Computer Science and Engineering
6	Information Technology
7	Computer Science and Engineering (Artificial Intelligence & Machine Learning)

1.4 Semester System & Structure

A student after securing admission shall complete the B.Tech programme in a minimum period of 4 academic years (8 Semesters) and a maximum period of 8 academic years (16 semesters) starting from the date of commencement of first year first semester, failing which student shall forfeit seat in B.Tech course and their admission stands cancelled. Each student shall secure 160 credits required for the completion of the Under Graduate Programme and award of the B.Tech degree.

A student will be eligible to get undergraduate degree with Honours or one Minor engineering, if he/she completes an additional 20 credits. A student will be permitted to register for Honours degree or one Minor engineering but not both.

1.4.1 UGC / AICTE

UGC /AICTE specified definitions / descriptions are adopted appropriately for various terms and abbreviations used in these Academic regulations / Norms, which are listed below.

1.4.2 Semester scheme

The duration of an academic programme shall be four years consisting of eight semesters. The maximum period for which a student can take to complete a full-time academic programme shall be double the normal duration of programme i.e., for regular students eight years, for lateral entry students six years from the date of admission. Each semester consists of minimum of 90 instruction days.

1.4.3 Subject Course Classification

All subjects/ courses offered for the Under Graduate programme in Engineering & Technology (B.Tech degree programmes) are broadly classified as follows.

S. No.	Broad Course Classification	Course Group/ Category	Course Description	Credits
1	Foundation Courses	BS – Basic Sciences	Includes Mathematics, Physics and Chemistry subjects	50-60
2		ES – Engineering Sciences	Includes Fundamental Engineering subjects	
3		HS – Humanities and Social sciences	Includes subjects related to Humanities, Social Sciences and Management	
4	Core Courses-I	PC – Professional Core	Includes core subjects related to the Parent discipline / department/ Branch of Engineering	45-50

5	Elective Courses	PE – Professional Electives	Includes Elective subjects related to the Parent discipline/ department/ branch of Engineering.	15-36
6		OE – Open Electives	Elective subjects which include interdisciplinary subjects or subjects in an area outside the parent discipline/ department/ Branch of Engineering.	
7	Core Courses-II	PW- Project Work	B.Tech project or UG project or UG major Project or Project Stage I & II	15-18
8		IP - Industrial training/Summer Internship/Mini-project	Industrial training/ Summer Internship/ Industrial Oriented Mini-project/ Mini-project	
9		TS- Technical Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.	
10	Skill Oriented Courses (SC)	-	1 or 2 Credit courses (subset of HS)	5-10
11	Mandatory Courses (MC)	-	Mandatory courses (non-credit)	NIL
12	Audit Course (AC)	-	Audit courses (non-credit)	NIL
			Total	**160**

1.4.4 Medium of Instruction

The medium of instructions for the entire Under Graduate Programme in Engineering & Technology will be English only.

1.5 Admissions

i. Regular admissions in to the first year of B.Tech programme in **Sri Venkateswara College of Engineering** will be as per norms of Jawaharlal Nehru Technological University Anantapur, Ananthapuramu and Government of Andhra Pradesh.

ii. Lateral entry admissions in to second year of B.Tech Programme in **Sri Venkateswara College of Engineering** will be as per norms of Jawaharlal Nehru Technological University Anantapur, Ananthapuramu and Government of Andhra Pradesh.

2 Induction & Extra Academics

2.1 Induction Program

There shall be mandatory student induction program for freshers, with three-week duration before the commencement of first semester. Activities include Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by eminent people, visits to local areas, familiarization to Dept./Branch & Innovations etc.,

2.2 Extra Academic Activity

In addition to completion of the academic requirements, to become eligible for the award of degree, every student should successfully complete Extra Academic Activity. During four-year B.Tech degree, every student is required to register for at least one of the following activities which are mandatory.

i. NSS
ii. Games & Sports
iii. Yoga/ Meditation
iv. Literary/ Cultural activities
v. Community service activities.
vi. Any other extension activities

The activities shall be carried out beyond the class hours. The activities will be monitored by the respective faculty In-charge and HOD. Each student shall maintain at least 75% of attendance independent of overall attendance to earn satisfactory grade which is mandatory. Evaluation shall be on the basis of participation, performance and behaviour. Grade shall be entered in the grade sheet as satisfactory/unsatisfactory and shall not be used while computing CGPA

3 Continuous Assessment

3.1 Attendance Requirement

 i. A student shall be eligible to appear for End Examinations. If he/she acquires at least 75% of attendance on cumulative basis of all subjects in the semester and 40% of minimum attendance should be maintained in each subject.

 ii. Condonation of shortage of attendance in genuine cases on health grounds may be recommended by the College Academic Committee, if a student puts an aggregate attendance of at least 65% and minimum of 40% in each subject. However, the student has to make an application and pay the prescribed fee.

 iii. Shortage of attendance below 65% in aggregate shall in no case be condoned.

 iv. Students whose shortage of attendance is not condoned in any semester are not eligible to take their End Examinations of that class and their registration shall stand cancelled.

 v. A student shall not be promoted to the next semester unless; he/she satisfies the attendance requirements of the current semester, as applicable. The student may seek readmission for the semester when offered next. He/she shall not be allowed to register for the courses of the semester while he is in detention. A student detained due to shortage of attendance, shall have to repeat that semester when offered next.

3.2 Choice Based Credit System (CBCS)

CBCS is introduced in line with UGC guidelines in order to promote

 i. Student Centred learning

 ii. Students to learn courses of their choice

 iii. Interdisciplinary learning

A Student has a choice of registering for courses comprising programme core, professional electives, open electives, MOOC courses, Value added / Skill based courses. Besides, choice is also offered to students for registering courses to earn Minor degree in Engineering/Honors degree.

3.3 Internal & External Assessment

The performance of a student in each semester shall be evaluated subject wise with a maximum of 100 marks for theory and 100 marks for practical subject. Mini project / Internship/ Skill oriented courses shall be evaluated for 100 marks each, Seminars shall be evaluated for 40 marks each & Project Work shall be evaluated for 250 marks

whereas mandatory courses with no credits shall be evaluated for 40 mid semester marks.

i. For theory subjects the distribution shall be 40 marks for mid semester evaluation and 60 marks for the end examination.

ii. For practical subjects the distribution shall be 40 marks for mid semester evaluation and 60 marks for the end examination.

3.3.1 Mid Semester Examination Evaluation

For theory subjects, during the semester, there shall be two midterm examinations. Each midterm examination shall be evaluated for 40 marks of which 25 marks for subjective paper (90 minutes duration), 5 marks for objective paper (10 minutes duration) and 10 marks for assignment.

*Note:

i. Any fraction shall be rounded off to the next higher mark.

ii. Subjective paper shall contain 3 either or type questions of which student has to answer one from each either or type question of equal weightage of 10 marks and the marks obtained for 3 questions shall be condensed to 25 marks.

iii. The objective paper shall contain 10 objective questions of equal weightage of 0.5 Marks.

iv. The assignment shall contain essay type questions/numerical problems/software development for each unit. It should be continuous assessment throughout the semester and shall be evaluated for 10 marks.

v. Consolidated of first and second mid semester marks shall be arrived at by considering the marks secured by the student in both the mid examinations with 80% weightage given to the better mid exam and 20% to the other.

vi. Final mid semester marks shall be arrived by adding Average of Assignment marks with the consolidated mid semester marks.

If the student is absent for the mid semester examination, no re-exam shall be conducted and mid semester marks for that examination shall be considered as zero.

First midterm examination shall be conducted for I, II units of syllabus. The second midterm examination shall be conducted for III, IV and V units.

3.3.2 End Examination Evaluation

End examination of theory subjects shall have the following pattern

   i.   There shall be 6 questions and all questions are compulsory.
   ii. Question 1 shall contain 5 compulsory short answer questions for a total of 10 marks, each question carries 2 marks. There shall be 1 short answer question from each unit.
   iii. In each of the questions from 2 to 11, there shall be either or type questions of 10 marks each. Student shall answer any one of them.
   iv. The questions from 2 to 11 shall be set by covering one unit of the syllabus for each question.

For theory subjects, consisting of two parts of different subjects, for Example Basic Electrical & Electronics Engineering, shall have the following pattern

   i.   End examination question paper shall be in two parts viz., Part A and Part B with equal weight age.
   ii. In each part there shall be 3 either or type questions of 10 marks each.

3.3.3 Evaluation of Practical Subjects

For practical courses, there shall be a continuous evaluation during the semester for 40 marks (Internal) and End examination shall be for 60 marks. Day-to-day work in the laboratory shall be evaluated for 30 marks by the concerned laboratory faculty based on the regularity, viva, observation & record and 10 marks for internal exam.

The end examination shall be conducted for 60 marks by the concerned laboratory faculty and a senior expert in the subject from the same department.

In a practical subject consisting of two parts (Eg: Basic Electrical & Electronics Engineering laboratory), the end examination shall be conducted for 30 marks in each part. Mid semester examination shall be evaluated as above for 20 marks in each part and final mid semester marks shall be arrived by considering the sum of marks obtained in two parts.

3.3.4 Evaluation of Design and / or Drawing

For the subject having design and/or drawing,

   i.   There shall be no objective paper in mid semester examination and subjective paper will be for 40 marks, of which 15 marks will be for day-to-day evaluation, 15 marks for mid semester examination, 10 marks for assignment

ii.   The end examination pattern shall consist of 5 questions, either or type, of 12 marks each. There shall be no short answer questions in the end examination.

3.3.5 Summer Internship / Mini Project

There shall be one Industrial / Research internship, at the end of IV semester. This course is to be registered during IV Semester taken up during the summer vacation for a period of minimum four weeks duration. The Summer Internship shall be submitted in a report form and a presentation of the same shall be made before a Department Evaluation Committee (DEC) and it should be evaluated for 100 marks. The DEC shall consist of the Head of the Department, the concerned Supervisor and a Senior Faculty Member of the Department. The DEC is constituted by the Principal/Controller   of Examinations on the recommendations of the Head of the Department. There shall be no internal marks for Internship. The Internship shall be evaluated at the end of the V Semester.

There shall be one mini project at the end of VI semester. This is to be registered during VI Semester taken up during the summer vacation, for a period of four weeks duration. A report/dissertation certified in the prescribed format by the concerned Supervisor and HOD shall be submitted to the Department. The viva voce shall be conducted by a committee consisting of Head of the Department, project supervisor and a senior faculty member of the department constituted by the Principal/Controller of Examinations and it should be evaluated for 100 marks. There shall be no internal marks for mini project. The mini project shall be evaluated at the end of the VII Semester.

3.3.6 Skill Oriented Courses

Five skill-oriented courses shall be offered during III semester to VII semester. Out of these, two courses shall be from the same domain and shall be completed in III and IV semesters. Of the remaining three courses, one shall be a soft skill course and the remaining two shall be skill-advanced courses either from the same domain or job-oriented skill courses, which can be of inter disciplinary nature.

The student shall be given an option to choose either the skill courses being offered by the college or to choose a certificate course being offered by external agencies (Industries / Professional bodies / APSSDC / NPTEL or any other accredited bodies) as approved by the college level committee.   **Refer Appendix-1.**

3.3.6.1 Internal Assessment

Course Category	Internal Evaluation
Soft Skills Courses	Continuous internal evaluation for 40 marks through Quiz, Presentation, Group tasks, Group Discussion, Debates, and Assignments etc.
Skill-Advanced Courses with Theory Component	Two sessional exams for 40 marks each shall be conducted and marks will be finalized with a weightage of 80% for the better score and 20% for the other.
Skill-Advanced Courses with Laboratory Component	Continuous internal evaluation for 40 marks through tests, assignments and model building etc.

3.3.6.2 External Assessment

There shall be comprehensive examination of three hours duration for 60 marks for the skill-oriented courses offered by the department / institution. If a student completes the certificate course offered by external agencies in view of these courses offered by the department/institution, the student shall submit the certificate issued by the recognized external agencies. The college level committee shall evaluate the grades / marks given by the external agencies and convert to the equivalent grade / marks.

3.3.7 Project Work

Procedure and Evaluation of Project Stage – I:

There shall be a presentation of abstract of the main project in the VII Semester. After selecting the specific topic, the student shall collect the information and prepare a report, showing his/her understating of the topic and submit the same to the department before presentation. The report and the presentation shall be evaluated by the Project Evaluation Committee (PEC) consisting of concerned supervisor and two senior faculty members. It shall be evaluated for 50 marks. A student shall acquire 2 credits, when he/she secures 40% or more marks for the total of 50 marks. It will be evaluated at the end of VII semester by PEC. There shall be no external evaluation.

Procedure and Evaluation of Project Stage – II:

Project work shall start in VII Semester and continue in the VIII Semester. The evaluation of project is as follows.

Out of 200 marks for the Project stage-II, 60 marks for Internal Evaluation and 140 marks for the end semester examination (viva-voce) shall be awarded.

(i) Internal Evaluation: The internal evaluation shall be made by the PEC, on the basis of TWO project reviews on the topic of the project. Each review shall be conducted for a maximum of 60 marks. For a total of 60 marks, 80% of better one of the two and 20% of the other one are added and finalized. The PEC is constituted by the Principal on the recommendations of the Head of the Department.

(ii) Semester end Evaluation: The semester end project work viva-voce examination shall be conducted by a committee consisting of external examiner, HOD and PEC members. The evaluation of project work shall be done at the end of the VIII Semester.

Three copies of the dissertation certified in the prescribed format by the concerned Supervisor and HOD shall be submitted to the Department. One copy is to be submitted to the Principal/Controller of Examinations. The external examiner shall be nominated by the Principal/Controller of the Examinations from the panel of three examiners submitted by the department.

3.3.8 Technical Seminars

There shall be 3 technical seminar presentations during III semester to VII semester. For the technical seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his/her understanding about the topic, and submit to the department before presentation. The report and the presentation shall be evaluated by the departmental committee consisting of Head of the Department, technical seminar supervisor and a senior faculty member. The technical seminar shall be evaluated for 40 marks. A student shall acquire 0.5 credit assigned to the technical seminar when he/she secures 40% or more marks for the total of 40 marks. In case, if a student fails in technical seminar, he/she shall reappear as and when supplementary examinations are conducted. The technical seminar shall be conducted anytime during the year as per the convenience of the department committee and students. There shall be no external examination for technical seminar.

3.3.9 Mandatory Courses

Mandatory courses carry "zero" credits. There shall be no Semester-end examination.

However, attendance in Mandatory courses shall be considered while calculating aggregate attendance in a semester. The internal examination shall be conducted and evaluated similar to the theory courses. The student shall be declared to have passed the mandatory courses only when he / she secures 40% marks in the internal examination. If the student fails, a re-examination shall be conducted for failed candidates in the consecutive semester. The performance of the student shall be indicated in the grade sheets "satisfactory" (or) "not satisfactory". The student should pass all the mandatory courses, for the award of B.Tech degree.

3.3.10 Audit Courses

Audit courses carry "zero" credits. There shall be no internal and semester end examination. However, attendance in audit courses shall be considered while calculating aggregate attendance in a semester. The student should study all the audit courses, and it shall be indicated in the grade Sheet.

3.3.11 Weightages for internal & external examinations

S No	Course	Marks	Examination and Evaluation	
1	Theory	60	End examination for 3 hours duration (External evaluation)	
		40	10	Assignments (Internal evaluation).
			5	5 marks for objective paper (10 minutes duration).
			25	Subjective paper shall be conducted for 30 marks and condensed to 25 marks (90 minutes duration).
2	Laboratory	60	End Lab Examination for 3 hours duration	
		40	30	Regularity, viva, observation & record
			10	Internal exam
3	Internship	100	A report and a presentation shall be made before a committee	
4	Mini Project	100	viva voce shall be conducted by a committee	

5	Skill Oriented Theory Courses	60	End examination for 3 hours duration (External evaluation) or Student shall complete a certificate course offered by external agencies	
		40	Internal examination shall be conducted and evaluated similar to theory courses. or 40 marks through Quiz, Presentation, Group tasks, Group Discussion, Debates, and Assignments etc	
6	Skill Oriented laboratory Courses	60	End Lab Examination for 3 hours duration	
		40	30	Regularity, viva, observation & record
			10	Internal exam
7	Project Work Stage - I	50	A report and a review shall be made before a committee	
	Project work Stage - II	140	Viva voce shall be conducted by a committee including external examiner.	
		60	A report and a review shall be made before a committee	
8	Technical Seminar	40	A report and a presentation shall be made before a committee	
9	Mandatory courses	40	Internal examination shall be conducted and evaluated similar to theory courses.	
10	Audit Courses	-	There shall be no internal and semester end examination. However, attendance in audit courses shall be considered	

3.3.12 Recounting / Revaluation

Students shall be permitted to apply for Recounting / Revaluation of the end examination answer scripts within a stipulated period after payment of the prescribed fee. After completion of the process of Recounting / Revaluation, the records are updated with changes if any, and the student shall be issued a revised grade sheet. If there are no changes, the student shall be intimated the same through a notice.

The Revaluation shall be carried out by an expert not less than Associate Professor cadre, as per the scheme of evaluation supplied by the examination branch in the

presence of Principal/Controller of Examinations. Neither the students nor his parents shall be permitted to the present during the valuation.

3.3.13 Supplementary Examinations

In addition to the regular end examinations conducted, the college may also schedule and conduct supplementary examinations for all the subjects of other semesters when feasible for the benefit of students. Such candidates writing supplementary examinations may have to write more than one examination per day. For eighth semester advanced supplementary examinations will be conducted.

3.3.14 Withholding of Results

In case of indiscipline or malpractice is pending against the candidate, the result of the candidate shall be withheld and he/she shall not be allowed/promoted to the next higher semester.

3.3.15 Re-Registration for Improvement of Internal Marks

Following are the conditions to avail the benefit of improvement of internal marks.

i.   The candidate should have completed the 4 years of B.Tech course work and obtained examinations results from I semester to VIII semester.

ii. He/she should have passed all the subjects for which the internal evaluation marks secured are more than 50%.

iii. Out of the subjects the candidate has failed in the examinations due to internal evaluation marks secured being less than 50%, the candidate shall be given a chance for Theory subjects and for a maximum of **three** theory subjects for improvement of internal evaluation marks.

iv. This provision is only for Theory courses. The candidate has to re-register for the chosen courses and fulfill the academic requirements (i.e., a student has to attend the classes regularly and appear for the mid-examinations and satisfy the attendance requirements to become eligible for appearing at the semester-end examinations).

v.   For each subject, the candidate has to pay a prescribed fee.

vi. In the event of availing the provision of Improvement of Internal evaluation marks, the internal evaluation marks as well as the Semester-end Examinations marks secured in the previous attempt(s) for the re-registered courses shall stand cancelled.

4 Promotional Rules

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/completion of regular B. Tech Programme of study.

i.   A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, drawing subject if he/she secures a minimum of 35% of marks in the end examination and a minimum of 40% of marks in the sum of the mid and end examination marks taken together. In case of mandatory courses, he/she should secure 40% of the total marks.

ii. A student shall be promoted from IV semester to V semester only if he/she fulfills the academic requirement of securing 40% of the credits in the subjects that have been studied up to IV semester from the following examinations, irrespective of whether the candidate takes the End examination or not as per the normal course of study.

- One regular and three supplementary examinations of I semester
- One regular and two supplementary examinations of II semester
- One regular and one supplementary examinations of III semester
- One regular examinations of IV semester

iii. A student shall be promoted from VI semester to VII semester only if he/she fulfills the academic requirement of securing 40% of the credits in the subjects that have been studied up to VI semester from the following examinations, irrespective of whether the candidate takes the End examination or not as per the normal course of study.

- One regular and five supplementary examinations of I semester
- One regular and four supplementary examinations of II semester
- One regular and three supplementary examinations of III semester
- One regular and two supplementary examinations of IV semester
- One regular and one supplementary examinations of V semester
- One regular examinations of VI semester

iv. A student shall register for all the 160 credits and earn all the 160 credits. Marks obtained in all the 160 credits shall be considered for the calculation of the DIVISION based on CGPA.

4.1 Student Transfers

Student transfers shall be as per the guidelines issued by the Government of Andhra Pradesh from time to time.

5 Grading System

5.1 Credits

All subjects / courses are to be registered by the student in a semester to earn credits which shall be assigned to each subject / course in an L T P C (lecture periods tutorial periods practical periods credits) structure based on the following general pattern.

Particulars	No. of Credits
1 Hour Lecture (L) per week	1
1 Hour Tutorial (T) per week	1
1 Hour Practical (P) per week	0.5
2 Hours Practical (P) per week	1
Technical Seminar	0.5
Skill Oriented Course / Skill Advanced Course / Soft Skill Course	2
Industrial / Research Internship (Summer Break after IV semester)	1.5
Mini Project (Summer Break after VI semester)	3
Major Project	12
Open Elective (MOOCs)	3
Mandatory Courses / Audit Courses	0

Student activities like NSS, Sports, etc. shall not carry any credits.

For Mini Project, Internship and Project Work where formal contact periods are not specified, credits are assigned based on the complexity of the work to be carried out.

5.1.1 Total Credits

The curriculum is designed for every programme so that the total credits will be 160 (121 only for lateral-entry students). To become eligible for the award of degree, every regular admitted student shall earn all the credits of 160 (121 for lateral-entry students) specified in the curriculum of the programme.

The student opting for B.Tech degree with Honors or B.Tech degree with Minor is required to earn additional 20 credits.

5.2 Award of Grades

After each subject is evaluated for 100 marks, the marks obtained in each subject will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

Structure of Grading of Academic Performance

Range in which the marks in the subject fall	Level	Grade	Grade points Assigned
≥ 90	Superior	A+	10
80-89	Excellent	A	9
70-79	Very Good	B	8
60-69	Good	C	7
50-59	Fair	D	6
40-49	Satisfactory	E	5
< 40	Fail	F	0
Absent	Absent	AB	0
Mandatory Courses			
>=40	Satisfactory	Y	-
<40	Not Satisfactory	N	-

i. A student obtaining Grade 'F' or Grade 'AB' in a subject shall be considered failed and will be required to reappear for that subject when it is offered the next supplementary examination.

ii. For mandatory courses, "Satisfactory" or "Unsatisfactory" shall be indicated instead of the letter grade and this will not be counted for the computation of SGPA/CGPA.

5.2.1 Semester Grade Point Average SGPA and Cumulative Grade Point Average CGPA

The Semester Grade Point Average 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 and the sum of the number of credits of all the courses undergone by a student, i.e.,

$$SGPA = \Sigma\, C_i \times G_i / \Sigma\, C_i$$

where, C_i is the number of credits of the ith subject and G_i is the grade point scored by the student in the ith course.

i The Cumulative Grade Point Average CGPA will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.,

$$CGPA = \Sigma\ C_i \times S_i / \Sigma\ C_i$$

ii Where "S_i" is the SGPA of the ith semester and C_i is the total number of credits up to that semester.

iii Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the mark sheets.

iv While computing the SGPA the subjects in which the student is awarded Zero grade points will also be included.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters A+, A, B, C, D, E and F.

5.3 Award of Class

After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B.Tech degree, he/she shall be placed in one of the following four classes.

Class Awarded	CGPA Secured
First Class with Distinction	≥ 7.5
First Class	≥ 6.5 & < 7.5
Second Class	≥ 5.5 & < 6.5
Pass Class	≥ 4.5 & < 5.5

6 Gap Year Concept

Gap year concept for student entrepreneur in residence is introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after IV semester to pursue full-time entrepreneurship. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The Head of the departments shall forward such proposals submitted by the students to the Principal. An evaluation committee constituted by the Principal shall evaluate the proposal submitted by the student and the committee shall decide whether to permit the students to avail the Gap Year or not.

7 Transitory Regulations

Discontinued, detained or failed candidates are eligible for readmission as and when the semester is offered after fulfilment of academic regulations. Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects. Candidates who are permitted to avail Gap Year shall be eligible for rejoining into the succeeding year of their B.Tech from the date of commencement of class work and they will follow the academic regulations into which they are re-admitted.

8 Curricular Framework for Honors Programme

i.   Students of a Department/Discipline are eligible to opt for Honors Programme offered by the same Department/Discipline.

ii. A student shall be permitted to register for Honors programme at the beginning of IV semester provided that the student must have acquired a minimum of 8.0 CGPA up to the end of II semester without any backlogs. In case of the declaration of the III semester results after the commencement of the IV semester and if a student fails to score the required minimum of 8.0 SGPA, his/her registration for Honors Programme stands cancelled and he/she shall continue with the regular Programme.

iii. Students can select the additional and advanced courses from their respective branch in which they are pursuing the degree and get an Honors degree in the same. E.g. If a Mechanical Engineering student completes the selected advanced courses from same branch under this scheme, he/she will be awarded B.Tech (Honors) in Mechanical Engineering.

iv. In addition to fulfilling all the requisites of a Regular B.Tech Programme, a student shall earn 20 additional credits to be eligible for the award of B.Tech (Honors) degree. This is in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160 credits).

v.   Of the 20 additional Credits to be acquired, 16 credits shall be earned by undergoing specified courses listed as **pools in Appendix-2**, with four courses, each carrying 4 credits. The remaining 4 credits must be acquired through two MOOCs, which shall be domain specific, each with 2 credits and with a minimum duration of 8 to 12weeks as recommended by the Board of studies.

vi.   It is the responsibility of the student to acquire/complete prerequisite before taking the respective course. The courses offered in each pool shall be domain specific courses and advanced courses.

vii.   The concerned BOS shall decide on the minimum enrolments for offering Honors programme by the department. If minimum enrolments criteria are not met then the students shall be permitted to register for the equivalent MOOC courses as approved by the concerned Head of the department in consultation with BOS.

viii.   Each pool can have theory as well as laboratory courses. If a course comes with a laboratory component, that component has to be cleared separately. The concerned BOS shall 16 explore the possibility of introducing virtual labs for such courses with laboratory component.

ix.   MOOC courses must be of minimum 8 weeks in duration. Attendance will not be monitored for MOOC courses. Students have to acquire a certificate from the agencies approved by the BOS with grading or marks or pass/fail in order to earn 4 credits. If the MOOC course is a pass/fail course without any grades, the grade to be assigned will be decided by the Academic council.

x.   The concerned BOS shall also consider courses listed under professional electives of the respective B.Tech programmes for the requirements of B.Tech (Honors). However, a student shall be permitted to choose only those courses that he/she has not studied in any form during the Programme.

xi.   If a student drops or is terminated from the Honors programme the additional credits so far earned cannot be converted into free or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate). In such cases, the student may choose between the actual grade or a "pass (P)" grade and also choose to omit the mentioned course. None of the courses done under the dropped Minor will be shown in the transcript.

xii.   In case a student fails to meet the CGPA requirement for Degree with Honors at any point after registration, he/she will be dropped from the list of students eligible for Degree with Honors and they will receive regular B.Tech degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

xiii.   Honors must be completed simultaneously with a major degree programme. A student cannot earn Honors after he/she has already earned bachelor's degree.

9 Curricular Framework for Minor Programme

i. a) Students who are desirous of pursuing their special interest areas other than the chosen discipline of Engineering may opt for additional courses in minor specialization groups offered by a department other than their parent department. For example, If Mechanical Engineering student selects subjects from Civil Engineering under this scheme, he/she will get Major degree of Mechanical Engineering with minor degree of Civil Engineering

   b) Student can also opt for Industry relevant tracks of any branch to obtain the Minor Degree, For example, a B.Tech Mechanical Engineering student can opt for the industry relevant tracks like Data Mining track, IOT track, Machine learning track etc.

ii. The BOS concerned shall identify as many tracks as possible in the areas of emerging technologies and industrial relevance / demand. For example, the minor tracks can be the fundamental courses in CSE, ECE, EEE,CE,ME etc or industry tracks such as Artificial Intelligence (AI), Machine Learning (ML), Data Science (DS), Robotics, Electric vehicles, Robotics, VLSI etc.

iii. The list of disciplines/branches eligible to opt for a particular industry relevant minor specialization shall be clearly mentioned by the respective BOS.

iv. There shall be no limit on the number of programmes offered under Minor. The Institution can offer minor programs in Emerging technologies based on expertise in the respective departments or can explore the possibility of collaborating with the relevant Industries/Agencies in offering the program.

v. The concerned BOS shall decide on the minimum enrolments for offering Minor programme by the department. If a minimum enrolments criterion is not met, then the students may be permitted to register for the equivalent MOOC courses as approved by the concerned Head of the department in consultation with BOS.

vi. A student shall be permitted to register for Minors programme at the beginning of IV semester subject to a maximum of two additional courses per semester, provided that the student must have acquired 8 CGPA (Cumulative Grade Point Average) upto the end of II semester without any history of backlogs. It is expected that the III semester results may be announced after the commencement of the IV semester. If a student fails to acquire 8 CGPA upto 3rd semester or failed in any of the courses, his registration for Minors programme shall stand cancelled. A SGPA of 8.0 has to be maintained in the subsequent semesters without any backlog in order to keep the Minors registration active.

vii. A student shall earn additional 20 credits in the specified area to be eligible for the award of B.Tech degree with Minor. This is in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160 credits).

viii. Out of the 20 credits, 16 credits shall be earned by undergoing specified courses listed as **pools in Appendix-3(A) & 3(B)** by the concerned BOS along with prerequisites. It is the responsibility of the student to acquire/complete prerequisite before taking the respective course. If a course comes with a laboratory component, that component has to be cleared separately. A student shall be permitted to choose only those courses that have not studied in any form during the Programme.

ix. In addition to the 16 credits, students must pursue at least 2 courses through MOOCs. The courses must be of minimum 8 weeks in duration. Attendance will not be monitored for MOOC courses. Student has to acquire a certificate from the Agencies approved by the BOS with grading or marks or pass/fail in order to earn 4 credits. If the MOOC course is a pass/fail course without any grades, the grade to be assigned as decided by the Academic council.

x. Student can opt for the Industry relevant minor specialization as approved by the concerned departmental BOS. Student can opt the courses from Skill Development Corporation (APSSDC) or can opt the courses from an external agency recommended and approved by concerned BOS and should produce course completion certificate. The Board of studies of the concerned discipline of Engineering shall review such courses being offered by eligible external agencies and prepare a fresh list every year incorporating latest skills based on industrial demand.

xi. A committee should be formed at the level of College/Universities/department to evaluate the grades/marks given by external agencies to a student which are approved by concerned BOS. Upon completion of courses the departmental committee should convert the obtained grades/marks to the maximum marks assigned to that course. The controller of examinations can take a decision on such conversions and may give appropriate grades.

xii. If a student drops (or terminated) from the Minor programme, they cannot convert the earned credits into free or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate). In such cases, the student may choose between the actual grade or a "pass (P)" grade and also choose to omit the mention of the course as for the following

xiii.   All the courses done under the dropped Minors will be shown in the transcript. None of the courses done under the dropped Minor will be shown in the transcript.

xiv.   In case a student fails to meet the CGPA requirement for B.Tech degree with Minor at any point after registration, he/she will be dropped from the list of students eligible for degree with Minors and they will receive B.Tech degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

xv.   Minor must be completed simultaneously with a major degree programme. A student cannot earn the Minor after he/she has already earned bachelor's degree.

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10 Academic Regulations (R20) for B.Tech (Lateral Entry Scheme, for the batches admitted from the academic year 2021 - 2022)

10.1 Award of B.Tech Degree

A student admitted in Lateral Entry Scheme (LEs) will be declared eligible for the award of the B.Tech degree if the student fulfills the following academic regulations

i. Pursues a course of study for not less than three Academic years and not more than six Academic years.

ii. Registers for 121 credits and secures all 121 credits from IV to VIII semester of Regular B.Tech programme.

Students, who fail to fulfill the requirement for the award of the degree within six consecutive academic years from the year of admission, shall forfeit their seat.

The regulations except 4 are to be adopted as that of B.Tech (Regular).

10.2 Minimum Academic Requirements

The following academic requirements have to be satisfied in addition to the attendance requirements

A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, drawing subject if he/she secures a minimum of 35% of marks in the End examination and a minimum of 40% of marks in the sum total of the mid semester and End examination marks taken together. In case of mandatory courses he/she should secure 40% of the total marks.

i. A student shall be promoted from VI semester to VII semester only if he/she fulfills the academic requirement of securing 40% of the credits in the subjects that have been studied up to VI year from the following examinations, irrespective of whether the candidate takes the End examination or not as per the normal course of study.

   - One regular and three supplementary examinations of III semester
   - One regular and two supplementary examinations of IV semester
   - One regular and one supplementary examinations of V semester
   - One regular examinations of VI semester

ii. A student shall register for all the 121 credits and earn all the 121 credits. Marks obtained in all the 121 credits shall be considered for the calculation of the division based on CGPA.

10.3 Course Pattern

i. The entire course of study is three Academic years on semester pattern.

ii. A student eligible to appear for the End examination in a subject, but absent at it or has failed in the End examination may appear for that subject at the next supplementary examination offered.

iii. When a student is detained due to lack of credits/shortage of attendance the student may be re-admitted when the semester is offered after fulfilment of academic regulations.

iv. There shall be additional four mandatory courses with zero credits English in III semester, Mathematics in IV semester, Problem Solving & Programming in V semester and AI Tools, Techniques and Applications in VI semester. There shall be no external examination for these mandatory courses. However, attendance in the mandatory course shall be considered while calculating aggregate attendance and student shall be declared to have passed the mandatory course only when he/she secures 40% or more in the mid semester examinations. In case, the student fails, a re-examination shall be conducted for failed candidates every six months/semester at a mutually convenient date of college/student satisfying the conditions mentioned in item 1 & 2 of the regulations.

11 General Instructions

i. The academic regulations should be read as a whole for purpose of any interpretation.

ii. Malpractices rules-nature and punishments are appended.

iii. Where the words "he", "him", "his", occur in the regulations, they also include "she", "her", "hers", respectively.

iv. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.

12 Amendments to Regulations

The Academic Council of **Sri Venkateswara College of Engineering (Autonomous)** reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., with the recommendations of the concerned Board(s) of Studies.

NOTE: FAILURE TO READ AND UNDERSTAND THE RULES & REGULATIONS IS NOT AN EXCUSE

13 Rules for Disciplinary Action for Malpractices / Improper Conduct in Examinations

S No	Nature of Malpractices / Improper conduct	Punishment
	If the candidate	
1. (a)	Possesses or keeps accessible in Examination Hall, any paper, note book, programmable calculators, Cell phones, Pager, Palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he/she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination).	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the Exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he/she will be handed over to the police and a case is registered against him/her.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the notice of Principal.

3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred for four consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the Academic regulations in connection with forfeiture of seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester / year. The candidate is also debarred for four consecutive semesters from class work and all end examinations, if his / her involvement is established. Otherwise, the candidate is debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him/her.

4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester / year. The candidate is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in Cancellation of the performance in that subject only. The answer paper or in letters to the examiners or writes to the examiner requesting him/her to award pass marks.	Cancellation of the performance in that subject only.
6.	Refuses to obey the orders of the Chief Superintendent / Assistant - Superintendent / any Officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-In charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester / year. If the candidate physically assaults the invigilator / officer-In-charge of the

	spoken or written or by signs or by visible representation, assaults the officer-In-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	Examinations, then the candidate is also debarred and forfeits his/her seat. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college's expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person (s) who do not belong to the College will be handed over to police and, a police case will be registered against them .
10	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.

11.	Copying detected on the basis of internal evidence, such as during valuation or during special scrutiny.	Cancellation of the performance in that subject only or in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester / year examinations, depending on the recommendation of the committee.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Principal for further action to award suitable punishment.	

Note -

Whenever the performance of a student is cancelled in any subject / subjects due to malpractice, he has to register for End Examinations in that subject / subjects consequently and has to fulfill all the norms required for the award of Degree.

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ANNEXURE-1

Subjects for skill-oriented courses:

i. BOS chairman concerned can add more subjects/tracks as per the availability of individual department needs.

ii. Two skill-oriented subjects will be from the Domain knowledge only.

iii. One skill subject shall be communication skills (including laboratory)

iv. Remaining two skill subjects will be from the same domain / interdisciplinary / Industry relevant subjects as per the choice of the student.

v. Pre requisites and eligibility can be decided by the concerned BOS.

SKILL, JOB ORIENTED TRACKS FOR MECHANICAL ENGINEERING

i. Design / Analysis / Simulation- CAD, UGNX, Solid Works, Ansys, FEA, CATIA, CREO etc

ii. Production / Manufacturing- CAM, Piping, A/QC, CNC

iii. Thermal / Computational- Computational Fluid Dynamics, MATLAB etc

iv. Service Sector- Industrial Safety and Management, Operation Research, Oil & Gas safety.

SKILL, JOB ORIENTED TRACKS FOR CIVIL ENGINEERING

i. Structural Design- AutoCAD 2D 3D, ANSYS Civil, ETABS, PRO Steel, etc.

ii. Building Design- Revit Architecture, ANSYS Civil, STAAD.PRO, AECOsim etc.

iii. Land survey and Transportation Design- Surveying, 2D Drafting, 3D Modeling, Analysis, Road & Transport Design etc.

SKILL, JOB ORIENTED TRACKS FOR COMPUTER SCIENCE & ENGINEERING / INFORMATION TECHNOLOGY/ ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

i. Animation course- VFX, CARTOONING, ANIMATION DESIGN, Game Designing Using Unity 3D etc.

ii. Mobile app development- App design for IOS and Android etc.

iii. Data Science- Natural language processing, sentiment analysis, fore casting, regression models etc.

iv. Python programming- Machine learning, Deep learning, IOT, Natural Language Processing, Game Graphics Programming, Data analysis etc.

v. Networking & Cyber Security

vi. Robotics Process Automation & Sales Force

vii. Web Designing, Development & Services

SKILL, JOB ORIENTED TRACKS FOR ELECTRONICS AND COMMUNICATION ENGINEERING

i. Mobile Communications

ii. CCNA Certification

iii. Artificial Intelligence/ Deep learning/ Industrial Automation etc.

iv. Design & Fabrication: Digital and Analog VLSI Design/Micro & Nano IC Fabrication

v. Designing and Interfacing: LabView, Arduino, Raspberry Pi

vi. Maintenance and Control: PLC and SCADA

vii. Robotics Technology/IOT Programming/Advanced Embedded Systems

SKILL, JOB ORIENTED TRACKS FOR ELECTRICAL AND ELECTRONICS ENGINEERING

i. Design/Analysis/Simulation: MATLAB, ETAP, PLECS, HOMER, E-CADD

ii. Circuit design and PCB Design: Multisim, OrCAD PSpice

iii. Designing and Interfacing: d-SPACE, LabVIEW, Arduino, Raspberry Pi

iv. Maintenance and Control: PLC and SCADA

ANNEXURE-2

Subjects for Honors degree:

i.   The subjects opted for Honors should be Advanced type which are not covered in regular curriculum

ii. Students has to acquire 16 credits with minimum one subject from each pool.

iii. Concerned BOS can add or delete the subjects as per the decision of the board.

iv. Pre requisites to be defined by the board for each course.

v.   Compulsory MOOC/NPTEL Courses for 04 credits (02 courses @ 2 credits each)

S No	Course Name	Offered To
	DEPARTMENT OF MECHANICAL ENGINEERING (FOR HONORS)	
	POOL 1	
1	Automobile Engine Design	ME
2	Automotive Transmission	ME
3	Autotronics & Safety	ME
4	Alternative Energy Sources for Automobiles	ME
	POOL 2	
1	Robotics: Modelling, Analysis and Control	ME
2	Modelling and Analysis of Dynamic Physical	ME
3	Theory and Design of Control Systems	ME
4	Smart Materials for Mechatronic Applications	ME
	POOL 3	
1	Mechanical Vibrations	ME
2	Product Design / CAD / CAM	ME
3	Flexible Manufacturing Systems/Design for manufacturing	ME
4	Reverse Engineering and Rapid Prototyping / Concurrent Engineering	
	POOL 4	
1	Advanced Thermodynamics	ME
2	Heat transfer / Heat power Engineering	ME
3	Jet Propulsion and rocket Engineering	ME
4	Computational Fluid Dynamics	ME

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING / INFORMATION TECHNOLOGY / ARTIFICIAL INTELLIGENCE & MACHINE LEARNING (FOR HONORS)

S No	Course Name	Offered To
POOL 1		
1	Data Mining and Data Warehousing	CSE / IT / AI&ML
2	Object Oriented Modelling and Design	CSE / IT / AI&ML
3	Cryptography	CSE / IT / AI&ML
4	Network Security and Cyber Law	CSE / IT / AI&ML
POOL 2		
1	Social Mobile Analytics & Cloud	CSE / IT / AI&ML
2	Security Governance Risk and Compliance	CSE / IT / AI&ML
3	Python Application Programming	CSE / IT / AI&ML
4	Software Design and System Integration	CSE / IT / AI&ML
POOL 3		
1	Software Architecture and Design Patterns	CSE / IT / AI&ML
2	Advanced JAVA and J2EE	CSE / IT / AI&ML
3	Storage Area Networks	CSE / IT / AI&ML
4	High Performance Computing	CSE / IT / AI&ML
POOL 4		
1	Machine Learning	CSE / IT / AI&ML
2	Natural Language Processing	CSE / IT / AI&ML
3	Perception and Computer Vision	CSE / IT / AI&ML
4	Multi Agent Systems	CSE / IT / AI&ML

DEPARTMENT OF CIVIL ENGINEERING (FOR HONORS)

S No	Course Name	Offered To
POOL 1		
1	Stability of Structures	CE
2	Experimental Methods in Structural Engineering	CE
3	Non-Linear Structural Analysis	CE
4	Advanced Design of Steel Structures	CE

POOL 2		
1	Advanced Geotechnical Engineering	CE
2	Geotechnical Measurements and Explorations	CE
3	Geotechnical Earthquake Engineering	CE
4	Rock Mechanics	CE
POOL 3		
1	Intelligent Transportation Systems	CE
2	Transportation Safety Systems	CE
3	Advanced Geometric Design of Highways	CE
4	Computer Simulation in Traffic Engineering	CE
POOL 4		
1	Global Navigation Satellite System	CE
2	Machine Processing of Remotely Sensed Data	CE
3	Geospatial Data Processing	CE
4	Introduction to Geodesy	CE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING (FOR HONORS)		
S No	**Course Name**	**Offered To**
POOL 1		
1	Advanced Embedded Systems	ECE
2	Advanced Digital Signal Processing	ECE
3	Digital Image Processing	ECE
4	Wireless Broadband Communications	ECE
POOL 2		
1	Non-Linear Optical Communication	ECE
2	Satellite Communications	ECE
3	Advanced VLSI	ECE
4	Internet of Things	ECE
POOL 3		
1	Radar Engineering	ECE
2	Cellular and Mobile Communications	ECE
3	Advanced Wireless Broadband Communications	ECE
4	Optical Networks	ECE

POOL 4		
1	Multicarrier Communication Systems	ECE
2	Nano Electronics	ECE
3	RF and Mixed Signals Circuits	ECE
4	Microelectronic Devices, Technology and Circuits	ECE

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING (FOR HONORS)		
S No	**Course Name**	**Offered To**
POOL 1		
1	Advance Power Electronics	EEE
2	Opto Electronics	EEE
3	Electric power quality	EEE
4	Remote sensing systems	EEE
POOL 2		
1	Advanced Power systems	EEE
2	Photonic network	EEE
3	Power Systems dynamics and control	EEE
4	Advanced Electrical Vehicles	EEE
POOL 3		
1	Embedded systems	EEE
2	Power system protection	EEE
3	Distribution system Engineering	EEE
4	Microwave design and measurement	EEE
POOL 4		
1	Advanced High voltage Engineering	EEE
2	Grid Integration of Renewable Energy Systems	EEE
3	Advanced Electric Machines	EEE
4	Semiconductor Device Modelling	EEE

ANNEXURE-3 (A)

GENERAL MINOR TRACKS

Note:

i.   The student can opt any 4 subjects from each pool.

ii.   Concerned BOS can add or delete the subjects as per the decision of the board.

iii.   Pre-requisites to be defined by the board for each course.

iv.   Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each)

Department of Mechanical Engineering

S No	Subject	Offered To
1	Engineering Mechanics	ME
2	Thermal Engineering	ME
3	Production Technology	ME
4	Fundamentals of Engineering Design	ME
5	Production Planning and control	ME
6	Materials Technology	ME

Department of Civil Engineering

S No	Subject	Offered To
1	Strength of Materials	CE
2	Fluid Mechanics	CE
3	Hydraulic Machines	CE
4	Structural Analysis	CE
5	Surveying	CE
6	Geology/ Soil Mechanics	CE

Department of Computer Science and Engineering

S No	Subject	Offered To
1	Operating systems	CSE
2	Data Structures Using C	CSE
3	Computer organization and Architecture	CSE
4	Data Base Management Systems	CSE
5	Object oriented Programming	CSE
6	Computer Networks	CSE

Department of Electrical and Electronics Engineering

S No	Subject	Offered To
1	Network Theory	EEE
2	Electronic Devices & Circuits/Electro-Magnetic Field Theory	EEE
3	DC Machines	EEE
4	Electronic circuit analysis	EEE
5	Network Analysis	EEE
6	AC Machines	EEE

Department of Electronics and Communications Engineering

S No	Subject	Offered To
1	Microprocessors	ECE
2	Electronic Devices & Circuits/Electro-Magnetic Field Theory	ECE
3	Digital Logic Design	ECE
4	Electronic circuit analysis	ECE
5	Network Analysis	ECE
6	Signals and systems	ECE

ANNEXURE-3 (B)

(FOR MINOR) SPECIALIZED TRACKS

Note:

i. A student can opt four subjects from each track @ 4 credits per subject

ii. Concerned BOS can add or delete the subjects as per the decision of the board.

iii. Pre-requisites to be defined by the board for each course.

iv. Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each)

S No	Course Name	Offered To
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING		
POOL 1		
1	Nanoengineering	ME
2	Green nanotechnology	ME
3	Nano-biotechnology	ME
4	Nano architectonics	ME
POOL 2		
1	Nano mechanics	ME
2	Chassis design and packaging:	ME
3	Vehicle body styling and aerodynamics	ME
4	Ergonomics, seating and Instrument panels	ME
5	Analysis of vehicle handling:	ME
6	Vehicle stability and design considerations	ME
POOL 3		
1	Biomechanics	ME
2	Bio materials	ME
3	Medical Device Design	ME
4	micro electro mechanical systems	ME
5	advanced lithography techniques	
POOL 4		
1	Machining of advanced workpiece materials	ME
2	Hybrid machining approaches	ME
3	Automatic machining algorithms	ME
4	Tool and part probing integration	ME
5	Statistical process control and six sigma	ME

DEPARTMENT OF CIVIL ENGINEERING		
S No	Course Name	Offered To
POOL 1		
1	Advanced Design of Steel Structures	CE
2	Bridge Engineering	CE
3	Earthquake Resistant Design of Structures	CE
4	Prestressed Concrete	CE
5	Prefabricated Structures	CE
POOL 2		
1	Ground Improvement Techniques	CE
2	Advanced Foundation Engineering	CE
3	Geotechnical Earthquake Engineering	CE
4	Design of Earth Retaining Structures	CE
5	Geo synthetics and reinforced soil structure	CE
POOL 3		
1	Design of Hydraulics Structures	CE
2	Advanced Water Resources Engineering	CE
3	Environmental impact assessment	CE
4	Solid waste management and landfills	CE
5	Advanced Environmental Engineering	CE
POOL 4		
1	Advanced Highway Engineering	CE
2	Traffic Engineering	CE
3	Advanced Pavement Design Engineering	CE
4	Urban Transport Systems Planning	CE
5	Railways, Docks, Harbors and airports	CE

	DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING/ INFORMATION TECHNOLOGY/ ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	
S No	**Course Name**	**Offered To**
POOL 1		
1	TCP/IP Protocol Suite	CSE / IT / AI&ML
2	Network Architecture and Design	CSE / IT / AI&ML
3	Network Security	CSE / IT / AI&ML
4	Cryptography	CSE / IT / AI&ML
5	Computer Forensics	CSE / IT / AI&ML
POOL 2		
1	Software Metrics and Measurements	CSE / IT / AI&ML
2	Software Verification and Validation	CSE / IT / AI&ML
3	Software Architecture and Design Patterns	CSE / IT / AI&ML
4	Software Project Management	CSE / IT / AI&ML
5	Fault Tolerant Computing	CSE / IT / AI&ML
POOL 3		
1	Enterprise Storage Systems	CSE / IT / AI&ML
2	Parallel Algorithms	CSE / IT / AI&ML
3	Cloud Networking	CSE / IT / AI&ML
4	Cloud Computing	CSE / IT / AI&ML
5	High Performance Computing	CSE / IT / AI&ML
POOL 4		
1	Soft Computing	CSE / IT / AI&ML
2	Machine Learning	CSE / IT / AI&ML
3	Natural Language Processing	CSE / IT / AI&ML
4	Perception and Computer Vision	CSE / IT / AI&ML
5	Multi Agent Systems	CSE / IT / AI&ML

	DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING	
S No	**Course Name**	**Offered To**
POOL 1		
1	Analog VLSI Design/VSLI Technology	ECE
2	Applications of MEMS Technology	ECE
3	CAD for VLSI Design	ECE
4	Design for Testability/ Low power VLSI	ECE
5	Design of Semi-Conductor Memories	ECE

POOL 2		
1	RF System Design	ECE
2	Radiation Systems	ECE
3	RADAR and Navigational Aids	ECE
4	Cellular Communications	ECE
5	Satellite Communication	ECE
POOL 3		
1	Computer Architecture	ECE
2	PLD's & FPGAs	ECE
3	VLSI Design	ECE
4	Embedded System Design	ECE
5	DSP Processors	ECE
POOL 4		
1	Intelligent Systems and Control	ECE
2	Adaptive Signal Processing	ECE
3	Statistical Signal Processing	ECE
4	Speech Signal Processing	ECE
5	Multimedia Signal Processing	ECE

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING		
S No	**Course Name**	**Offered To**
POOL 1		
1	Distribution System Planning & Automation	EEE
2	Restructured Power Systems	EEE
3	HVDC & FACTS	EEE
4	Power Quality	EEE
5	Smart Grid Technologies	EEE
POOL 2		
1	Advanced Power Electronics	EEE
2	Advanced Electrical Drives	EEE
3	HVDC & FACTS	EEE
4	Power Quality	EEE
5	Hybrid Electrical Vehicles	EEE

POOL 3		
1	State Estimation & System Identification	EEE
2	Digital Control Systems	EEE
3	Non Linear Control Systems	EEE
4	Optimal Control Systems	EEE
5	Adaptive Control Systems	EEE
POOL 4		
1	Energy Conservation & Audit	EEE
2	Utilization of Electrical Energy	EEE
3	Solar & Fuel cell Energy Systems	EEE
4	Wind & Biomass Energy Systems	EEE
5	Nuclear, Geothermal & Tidal Energy Systems	EEE