



C.V. RAMAN COLLEGE OF ENGINEERING, BHUBANESWAR
(An Autonomous Institute Affiliated to BPUT, Odisha)



Academic Information Booklet
For Under-Graduate Programmes
ACADEMIC YEAR 2015 - 2016

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FOREWORD

The C.V. Raman College of Engineering (CVRCE), after receiving the Autonomous status from the academic session 2011 – 12, has been working very hard to implement student centric schemes. The objectives kept in mind are:-

- 1) Overall personality development of the student
- 2) Inculcate self study culture amongst students
- 3) Multi-disciplinary approach
- 4) Choice based courses/credits
- 5) International exposure
- 6) Enhance the effectiveness of teaching – learning process
- 7) Internationally compatible academic calendar
- 8) Develop the Students, not Examinees
- 9) Well planned Formative and Summative assessments
- 10) Reforms in Examination process
- 11) Publication of results within 15 days of last Examination
- 12) Involvement of industry in curriculum design and teaching – learning process

To achieve the above objectives, several out-of-the-box innovative practices are being implemented, such as:-

- 1) GP / PD/ SD / HSS Courses
- 2) Home Assignment for all subjects
- 3) Semester wise mini project
- 4) Communication and Soft Skill courses
- 5) Three semester major project
- 6) Introduction of Honors / Minor Schemes
- 7) Proposed to reduce class strength of around 40 per section
- 8) Need based remedial teaching
- 9) End-Semester Examination as per Bloom's Taxonomy
- 10) Online Test for every course covering all years
- 11) Implementation of ERP system

This booklet contains all the important and useful information necessary for a student to understand the teaching – learning and assessment systems. I hope that the students will go through it and take maximum benefit.

Prof. (Dr.) K.C. Patra
Director

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ACADEMIC RULES AND REGULATIONS

I) Preface

a) Information about CVRCE:

The C.V. Raman College of Engineering was established in 1997 under the aegis of Raman Education Society, a registered society under the Society Registration Act, 1860, to promote access and to provide the state of the art Engineering and Management education with human values to those who have had no access to such programs previously.

The institution aims at moulding a new breed of technocrats with a competitive edge to match national and international standards. The institution hopes that its students will become not only successful professionals but also excellent human beings who will contribute significantly to the welfare of the society and enrich the quality of life.

The institution is approved by All India Council of Technical Education (AICTE) and affiliated to Biju Patnaik University of Technology (BPUT) for Eight B.Tech Programs, Eight M.Tech Programs and MBA, and affiliated to Indian Maritime University (IMU), Chennai for Marine Programs. The institute is accredited by NAAC, UGC and NBA, New Delhi. It is also an ISO 9001-2008 certified institute. The college sits on a beautifully landscaped area situated at the outskirts of Bhubaneswar by the side of NH5.

The vision and mission of the college are borne out by the following statements:

VISION:

To emerge as a global leader in the area of technical education commensurate with the dynamic global scenario for the benefit of mankind.

MISSION:

To provide state-of-art technical education at the undergraduate and postgraduate levels. To work collaboratively with technical Institutes/ Universities/Industries of National and International

repute. To keep abreast with latest technological advancements to enhance the R and D activities.

The Institute runs 09 Under-graduate Programmes and 09 Post-graduate Programmes. They are as follows:

Under- Graduate Programs:

Sl. No	Branch/Discipline	Intake Capacity
01	Electronics and Instrumentation Engineering	60
02	Chemical Engineering	60
03	Civil Engineering	120
04	Computer Science and Engineering	120
05	Electrical Engineering	120+60
06	Electronics and Tele-communication Engineering	180
07	Information Technology	60
08	Mechanical Engineering	120+60
09	Marine Engineering	40

Post-Graduate Programs:

Sl. No	Branch/Discipline	Intake Capacity
01	Master in Business Administration	60
02	M.Tech in Chemical Engineering	18
03	M.Tech in Food Technology	18
04	M.Tech in Heat Power Engineering	18
05	M.Tech in Computer Science and Engineering	18+18
06	M.Tech in Electronics and Communication Engineering	18+18
07	M.Tech in Power System Engineering	18
08	M.Tech in Mechatronics	18
09	M.Tech in Information Technology	18

Research Programs:

Sl. No	Name of the Program
1)	Ph.D. Mechanical Engineering
2)	Ph.D. Chemical Engineering
3)	Ph.D. Industrial Engineering
4)	Ph.D. Electronics & Instrumentation Engineering
5)	Ph.D. E & TC Engineering
6)	Ph.D. Computer Science & Engineering
7)	Ph.D. Information Technology
8)	Ph. D Civil Engineering
9)	Ph. D Electrical Engineering
10)	Power System Engineering
11)	Control Engineering
12)	Ph.D. Management
13)	Ph.D. Humanities and Social Sciences
14)	Ph.D. Physics
15)	Ph.D. Chemistry
16)	Ph.D. Mathematics

The Institute obtained Academic Autonomy since October 2010 and has implemented it with good effect. The Institute has designed 'A Joyful Learning Model' which emphasizes on the overall development of the student as a responsible Engineer as well as a good human being, rather than producing a mere technocrats.

Unique Academic Features implemented since Autonomy

The Institute has emphasized on experiential learning and consciously designed its curriculum to allow students to carry out extra academic activities and stay academically pre-occupied on the campus throughout the day. To that effect, the Institute has designed novel courses such as General Proficiency (GP), Professional Development (PD), Skill Development (SD), Mini Project (MP) for every semester, Comprehensive Viva- Voce (CVV), Communication and Soft Skill Courses, Technical and General Seminars, Technical Report Writing, Foreign Languages, Open Electives (OE) based on legal, commercial aspects as well as some courses emphasizing on Engineering Ethics, Philosophy, etc. The Institute also offers optional inter-disciplinary courses under the Minor Stream and optional super specialization courses under the Honors Stream.

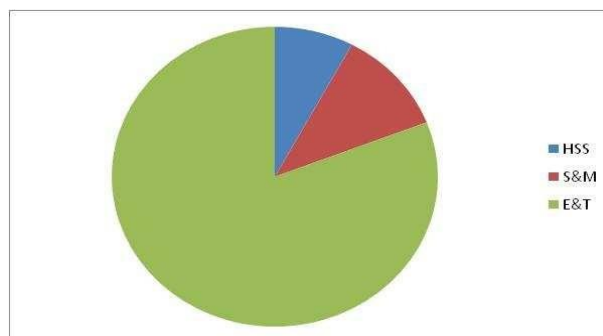
Both the optional streams receive a warm response from the students. 80% of the students opt for the courses under these streams. The details of the courses along with the objectives are covered later in III (f).

II) Introduction

a) Composition of courses:- The Institute has maintained a critical balance and sufficient representation of Humanities and Social Sciences (HSS) courses, Basic Sciences and Mathematics (S&M), Engineering and Technology (E&T) courses.

The Institute follows a Credit Based System (CBS) and Grade Point Averages (GPA) are calculated in every semester. The student can earn additional 20 credits through optional Honors/Minor courses.

The distribution of HSS, Science and Mathematics (S&M), Engineering and Technology (E&T) courses, typically is as under:-



b) Phases of Study

The curriculum is carefully designed to impart the necessary knowledge of engineering, technology as well as social sciences to prepare a competent global citizen. The three phases are as under:-

Phase I – Intense study of basic science, humanities and mathematics

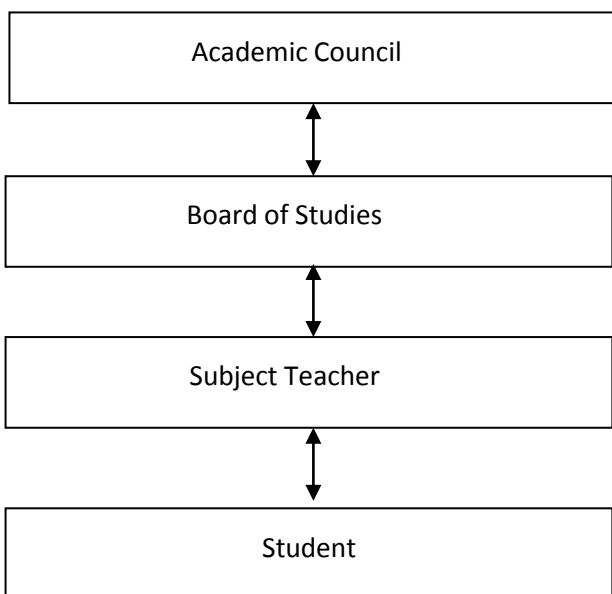
Phase II – Study of Engineering Sciences and Technology

Phase III – Exposure to Applied areas in chosen program of study

c) Academic Administration

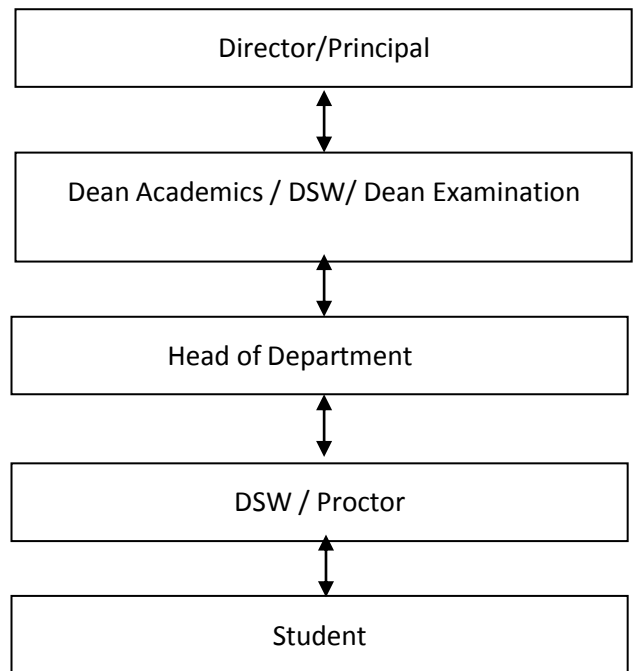
The Academic Council of the Institute is the apex academic body that takes decisions about the

implementation of academic practices in the Institute. The Director/Principal is the Chairman of the Academic Council. For policy making and implementation of program specific academic initiatives, Board of Studies (BOS) are formed in the Nine Degree awarding departments – BOS MBA, BOS Electronics and Instrumentation Engineering, BOS Chemical Engineering, BOS Civil Engineering, BOS Computer Science and Engineering, BOS Electrical Engineering, BOS Electronics and Telecommunication, BOS Mechanical Engineering and BOS Information Technology along with non program offering Department viz. Departments of Physics, Chemistry, Mathematics, Humanities and Social Sciences and Management. The Head of the Department is the Chairman of the respective Board of Studies. The Academic Council policies are implemented at the program level through respective Board of Studies.



For redressal of academic grievance of a student, the Institute has a mechanism in place.

A Faculty member is appointed as a Proctor for a group of 20-25 students. The Dean Students Welfare (DSW) / Proctor work as counselor to address the issues reported by the students. Based on the gravity of the grievance, the issue is handled and resolved by the college authorities in a bottom up approach as indicated below:



d) Academic Calendar

The Teaching – Learning for each Semester is carried out for minimum 90 working days a Semester as per the stipulations of the University Grants Commission (UGC), All India Council for Technical Education (AICTE) and BPUT, Odisha norms. The Institute plans its academic calendar for the forthcoming academic year well in advance and adheres to it. The academic calendar typically covers the following activity details:-

1. College re-opening after summer vacation
2. Students' registration and Director's / Principal's / Dean Academic's address
3. Teaching Learning activities – inclusive of Remedial teaching
4. Examination and Assessment Schedule
5. Student Activity Details
6. Schedule of various meetings / Audits etc.
7. Vacations and holidays

The academic calendar is designed so as to provide maximum 8 week Summer break, 1 week Winter break and 1 week Durga Puja Holidays.

*The students utilize the internationally compatible 8 week Summer break for internships in India **and /or** abroad or for development of project or for a substantial co-curricular or extra-curricular activity development.*

The student activities such as annual Athletic meet, cultural activities, national level holidays/local holidays, Annual Social Gathering, the Inter-Departmental student fest etc. are all included in the academic calendar.

I) Curriculum / Program details

a) Structure and Syllabus for program of study:-

The typical structure for a semester in any program of study consists of the following minimum courses:-

- i) 5 core theory courses:-
 - a. 4 Departmental Core
 - b. 1 Interdepartmental / Honors / Minor
- ii) 5 Laboratory courses:-
 - a. 2 Departmental at Core
 - b. 1 Skill Development / Professional Development lab
 - c. 1 General Proficiency lab
 - d. 1 Major Project (From 6th Semester B.Tech. to 8th Semester B.Tech.)
- iii) 2 Theory course tutorials
- iv) 1 Mini Project based on courses in Sr. No. (i) above for 1st Semester B.Tech. to 5th Semester B.Tech. students.
- v) Comprehensive viva-vocé as a part of assessment on courses identified by respective BOS.
- vi) General Proficiency, Open Elective and Communication & Soft Skill Courses for F.Y. B.Tech. students
- vii) Communication & Soft Skill Courses for S.Y. B.Tech. students.
- viii) Skill Development courses for S.Y. B.Tech. students.
- ix) Professional Development courses, technical seminar and Stage-I of the major project for T.Y. B.Tech. students.
- x) Stage-II and Stage-III of the major project for FINAL YEAR B.Tech. students.

The year-wise break up of credits for all applicable patterns for all branches is as under :-

PATTERN	F.Y. B.TECH.	S.Y. B.TECH	T.Y. B.TECH	FINAL YEAR B.TECH
A-15	48	50	50	42

For every program, Program Educational Objectives (PEO) are defined by the respective Boards of Studies. Program Educational Objectives are the broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve.

For every theory, practical, tutorial course, the course objectives are defined. It is ensured that the course objectives are in synchronization with the Program Educational Objectives.

The typical syllabus for a theory course consists of 5 units – Unit I to Unit V. Each unit is divided into the core conceptual part with some applications as one part and the applied part or some additional applications as the other part. The Core part is to be taught in class and the other Part is designed for learning beyond syllabus. **Students are expected to submit Home Assignments, which focuses on teaching – learning beyond the syllabus, as scheduled. To take cognizance of the learning beyond syllabus, 10% – 15% question in ESE are reserved for this Part.**

The structure and syllabi for the programs offered by the Institute are available on the Institute website:

<http://www.cvrce.edu.in/academics/curriculum>

b) Patterns:-

It is proposed to review the structure every 4-5 years. The initial autonomous structure was implemented in July 2011 by adopting the BPUT Syllabus. No major revision could be taken up in the BPUT syllabus till July 2014. The new revised syllabus is now adopted from the academic session 2015-16. For ease of examination, assessment, transcripts and other relevant purposes, every incoming batch will be assigned a pattern which is a unique identifier for the structure and syllabus to be implemented for the said batch during the four years of engineering course. The patterns effective for academic year 2015 – 16 is as under :-

Year of Study	Pattern
(First Year) F. Y. B.TECH.	A-15

In the next academic year, students admitted in First Year will be under pattern B-16 while the students of SECOND YEAR B.TECH. would be in pattern A-15.

c) Coding Scheme:-

The Institute offers diverse types of courses. In order to distinguish the courses, while maintaining their uniqueness, an alphanumeric coding scheme is designed. It is as under:-

Consider a 7 character alphanumeric entry XX12345 where first two characters (XX) represent BOS name; third character (1) indicates year of course; fourth character (2) indicates subject category; fifth character (3) indicates subject sub-category and last two characters (45) indicate subject number.

The abbreviations for the various BOS are as under:-

Code	BOS
CE	Civil Engineering
CH	Chemical Engineering
CS	Computer Science and Engineering
EE	Electrical Engineering
EC	Electronics and Tele-communication Engineering
EI	Electronics and Instrumentation Engineering
IT	Information Technology
ME	Mechanical Engineering
HS	Humanity and Social Science
MA	Mathematics
CY	Chemistry
PH	Physics
MB	MBA
IN	Institute Level

Year of course is:-

NUMBER	YEAR
1	First Year of B.Tech. – UG
2	Second Year of B.Tech. - UG
3	Third Year of B.Tech. - UG
4	Fourth Year of B.Tech. - UG
5	First Year of M.Tech./MBA - PG
6	Second Year of M.Tech./MBA - PG
7	Third Year of M.Tech./MBA. (applicable for Part-time programs)
8	Course work for Ph.D. program (As applicable)

Various subject categories are:-

Number	Subject Category
0	Department Courses
1	MD / Multidisciplinary courses
2	EL / Department Elective Courses
3	Institute Level Elective Courses
4	Skill Development (SD) courses
5	General Proficiency (GP) courses
6	Open Elective (OE) / HSS courses
7	Seminar & Project Work
8	Honors Courses
9	Minor Courses

The subject sub-category coding is as shown:-

Number	Subject Sub-Category
0	Sit-through (Guest Lecture)
1	Theory
2	Tutorial
3	Laboratory
4	Comprehensive Viva Voce (CVV) / Oral
5	Audit course
6	Group Credits

d) Minimum credit requirements and individual academic planning (Fast Learner, Slow Learner, etc.)

The minimum credits to be earned to acquire a Bachelor of Technology degree by a student admitted in **F.Y. B.TECH.** is **190**.

The minimum credits to be earned to acquire a Bachelor of Technology degree by a student admitted under Lateral Entry Scheme in Second Year Direct Admission (**SEDA**) is **142**.

Average number of credits offered per

semester is 24-26 except for the Final Year. The meritorious student having excellent academic performance till Second Year can **register for 8 additional credits each in the subsequent three semesters** as per the advice of Chairman – BOS / Faculty advisor and *meet with the minimum credit requirements*. The last six months may then be used for industry internship by the candidate. Such student is considered as **‘FAST TRACK’** student. However, the degree is awarded at the end of four academic years only.

Course drop facility is also provided for less performing students. As per the advice of Chairman – BOS / Faculty Advisor, such student may register for the backlog courses instead of regular courses so as to enhance the academic performance in future. Such student can earn the minimum credits in a span of maximum seven academic years.

e) Objectives of various courses and their implementation details –

i) General Proficiency (GP)

Institute offers General proficiency courses in First and Second year engineering. The objectives are:-

- Improve the overall personality of the student
- Inculcate other personality traits such as street smartness, Communication skills and General awareness etc.
- Introduce courses which complement Engineering learning
- Release mental stress
- Contribute to social issues through group dynamics courses
- Large number of options are available to the students to choose subjects from four categories viz Soft Skills, Hobby, Health and International Languages.

The list of courses under General Proficiency is attached in Appendix A.

ii) Skill Development (SD)

Skill Development courses are offered in First and

Second Year engineering. The objectives are:-

- To enhance the analytical and psychometric skills of the students as per current Industrial Trends.

iii) Professional Development (PD)

Professional Development courses are offered in third year. Expert resource persons from industry are invited as visiting faculty for these courses. Faculty from the Institute with additional professional knowledge also contribute in these subjects.

Objectives are:

- Bridge the gap between industry and institute.
- Study subjects as per current industrial trends.

iv) Open Elective courses (OE)

- To supplement the technical knowledge in the field of engineering, and to prepare as responsible citizens, courses such as Sociology, Psychology, Philosophy and Environmental Science & Engineering are taught.
- The commercial knowledge essential for the Engineer is also provided through courses like Engineering Economics & Costing, Management Techniques, Cost & Accounting, Business Law etc.

v) Communication & Soft Skill (CSS)

Institute offers Communication & Soft Skill courses in First and Second year engineering.

Objectives are:

- To understand the basics involved in communication.
- To improve speaking, reading, writing and listening skills.
- To develop the overall personality of the student.
- To inculcate organized reference search and presentation of summary in an effective manner.

The list of courses offered under Communication and Soft Skill is as follows:-

- i) Communication Skill
- ii) General Seminar
- iii) Technical Writing etc.

vi) Mini-Project (MP)

From 1st Semester B.Tech. to 5th Semester B.Tech. a Mini Project is to be carried out in every Semester.

The objectives behind the Mini Project are:

- Scope for creativity
- Hands on experience
- Academic occupancy
- Group Activity

vii) Comprehensive Viva-Voce (CVV)

To test the spoken skills of the students and the ability to think logically under time pressure, a comprehensive Viva Voce is conducted for the students in both Semesters of S.Y. B.Tech. and T.Y. B.Tech.

The examination is based on identified courses decided by the respective Board of Studies.

CVV proves extremely useful for placement Interviews.

viii) Seminar (5th Semester)

A technical seminar is to be delivered by every student in 5th Semester B.Tech. The objectives behind the technical seminar are :-

- To inculcate the reference search and effective technical précis writing skills among students
- To enhance time management and presentation skills
- To strengthen the literature survey and other research attributes essential for Major project activity

ix) Major project

A Major project activity starting from 6th Semester B.Tech. up to 8th Semester B.Tech. (a 3-stage project) is carried out.

The students typically undergo group formation, area finalisation; design and development; testing, generation and verification of results, research publication procedure.

f) Opportunities for additional learning – Honors / Minor stream – Details – names of subject, laboratory course distribution, etc.

The Institute introduced an academic feature i.e. Honors / Minor stream, which serve as a unique opportunity for additional learning. The Honors stream provides an opportunity for the eligible students to explore specialization in the domain area.

The Honors stream enhances employability in core areas. It produces a focused output, enhancing suitability for a Master's Degree in Engineering / Technology. It also adds uniqueness to the resumé.

The Minor stream has a thrust in inter-disciplinary knowledge acquisition. It is observed to enhance employability in technical areas where diverse skills are required to be applied in practice. *Minor stream is the opportunity for the student to obtain exposure to other engineering disciplines of their choice.*

The Honors / Minor stream provides an opportunity to student to earn 20 additional credits. Out of the 20 credits, 15 credits are earned via 5 theory courses, learnt from 4th Semester B.Tech. upto 8th Semester B.Tech. The remaining 5 credits are earned through experiential learning in terms of a specially designed Professional Development course, a Technical Seminar, paper publication in relevant area, a Honors / Minor Mini Project, an industrial inplant training of minimum 2 weeks' duration and a comprehensive viva-vocé based on the contents of the entire Honors / Minor stream in 8th Semester B.Tech.

The very fact that Honors / Minor stream is being offered is a unique academic practice of the Institute and that the stream contains theoretical as well as experiential learning opportunity makes it even more special.

Examples of some of the Honors / Minor streams offered (with applicable eligibility requirements – academic as well as branch specific) are as follows:-

i) Honors streams

Sr. No	Code	Name
1)	MEH001	Industrial Engineering
2)	MEH002	Automobile Engineering
3)	EIH001	Instrumentation & Control
4)	CHH001	Chemical Engineering
5)	CSH001	Networking
6)	ECH001	VLSI Design
7)	ECH002	Signal Processing and
8)	ECH003	Embedded Systems Design

ii) Minor streams

Sr.	Code	Name
1)	MBM004	Industrial Management
2)	CSM001	Computer Engineering

The academic performance of the student in the chosen Honors / Minor stream is shown in the comprehensive statement of grades issued at the time of graduation.

The academic performance in Honors / Minor does not influence the CPI calculation of the 8 semesters.

A separate CPI is calculated for the entire stream after the student earns the requisite 20 credits.

g) Summer term facility for students

For all B.Tech students an additional make-up semester facility, known as Summer quarter, is tentatively conducted during May-June. Makeup classes are conducted for all subjects of both even and odd semesters.

Students opting for such makeup classes shall have to pay Rs.3000/- only per Semester towards such

classes (irrespective of the no. of subjects) over and above the registration fees.

Eligibility Criterion:

- I) *The students falling short of attendance in the preceding two semesters (i.e. less than 75%)*
- II) *The students who failed in the end term examinations of the preceding two semesters.*
- III) *The students who failed to appear at the examinations of the preceding two semesters on Medical ground with submission of valid medical certificates (with regards to serious illness of himself or a calamity in the family).*
- IV) *The students who fall short of attendance in the preceding two semesters must compensate by attending makeup classes conducted during the summer quarter to be able to appear at the examinations of the summer quarter.*

The entire teaching-learning- assessment and other academic activities are as follows:-

h) International Relations Cell activities for students

The Institute provides unique opportunity to deserving students to attend one semester in leading engineering institutes in India and abroad under Student Exchange Program. *The Institute is in the process of a tie-up with different Institutes and Universities in India and abroad for this purpose.*

A thorough procedure is carried out for the selection of students on the basis of academic performance, personality, international exposure, aptitude, willingness and adaptability, etc. An academic equivalence is set up by respective Board of Studies and the students register for recommended audit courses before the departure or upon arrival. The student performance during the Semester abroad is also scrutinized and on that basis, the requisite credits applicable for the semester are transferred to the student.

The Institute has established an **International Relations Cell** through which conscious efforts are taken to seek academic partnership with internationally reputed universities.

The Institute plans to establish an Incubation Centre and Post-Graduate research facility.

The Institute has taken conscious efforts to train its promising faculty and aspiring students under the tutelage of faculty of international repute during the summer and *winter breaks*.

i) Issue of Transcripts

Transcripts are usually issued when the graduating students seek admission for higher studies in India and abroad.

It is a reflection of the University, Institute information, the salient features of the program of study; teaching and examination scheme applicable for the student under the Autonomous format, etc. It is supplemented by certified Grade Sheets of the candidate. The transcripts, at times, are used to procure scholarships as an authentic document.

The Institute has a policy of issuing transcripts to all graduating students upon request as per the office procedure.

IV) Assessment and Examination

a) Formative Assessment -

As a part of the Joyful Learning Model, the Institute has designed an assessment scheme that ensures regular studies during the course of semester. This formative assessment mechanism is to ensure:-

- i) Continuous Teaching – Learning Assessment
- ii) Obtaining regular feedback from students

Continuous assessment is carried out as Teacher’s Assessment and Mid-Semester Examination. The Teacher’s Assessment component focuses on the students’ performance in Class Test based on Unit I, Home Assignments on self study components of all 5 units and an objective type online Mid Semester Examination on Unit II and Unit III.

For laboratory courses, the performances of each experiment are assessed on a weekly basis.

b) Summative Assessment -

The overall understanding of the theory course is assessed by means of the conventional 3 hour End-Semester Examination paper of 100 marks for all applicable courses. Here, paper is set up on all 5 units and, it is ensured that an equal overall emphasis is given on all 5 units, considering **Class Test and Mid-Semester Examination**. Based on the nature of theory course, instead of setting up memory recall type questions, Bloom’s Taxonomy guidelines are used and an appropriate paper which tests design, analysis, simulation, application, logic, reasoning, quantitative skills, abilities of student, etc. is set up. Such careful in-depth thinking and thorough preparation for the summative assessment is another unique academic feature of the Institute.

For laboratory courses, the overall understanding is assessed at the end of the term by setting up a practical or oral examination for the given course.

As a part of the summative assessment a comprehensive viva-vocé is also conducted for the S.Y. B.TECH. and T.Y. B.TECH. students to gauge the knowledge and understanding of the courses learnt in the semester.

c) Mode of evaluation for theory course

For a typical theory course, the student earns an appropriate grade based on the marks scored during the Semester. The formative and summative assessment components are combined to generate the total marks out of 100. The breakup is as under:-

Parameter	Marks	P. Mark
i) Teacher’s Assessment	20	-
ii) Mid Sem. Examination (Online / Offline Test)	20 (1 Hour)	-
iii) End Semester Examination	60 (3 hour)	21
TOTAL	100	37

- i) The Teacher’s Assessment marks are based on the student’s performance in tutorial, Home Assignments and Class Test. The breakup is as

follows:-

Parameter	Marks
Class Test	30 (1 Hour)
Home Assignment	30
Tutorial (if applicable)	10
TOTAL	60 or 70

The mode of conduct of the class test is decided by the faculty / group of faculties teaching the course. The mode of such class test could be a multiple choice based objective exam, a quiz, an online examination, etc.

Five **Home Assignments** from **Self Study** part of each Unit, worth 6 marks each, is set up by the faculty and is assessed regularly.

Tutorials are carried out in a batch size of 15 to supplement the theory course and to ensure one to one interaction with the student. This exposure and informal interaction with the faculty boosts the students' confidence. Tutorials are evaluated and at the end of the semester, a net score out of 10 is calculated.

The total 60 or 70 marks thus obtained, are converted to 20 in the final calculations.

ii) The Mid Sem. Examination (Conducted either Online / Offline). In the online objective type Examination, multiple choice based questions with varying degree of difficulty are set up. Proportionate number of questions with variable degree of difficulty is selected from the pool of questions set up by the faculty. In case offline Examination, GATE Type questions will be prepared by the faculty.

The total number of questions for Unit II and Unit III is 10 each. Each of the 20 questions is worth 1 mark.

iii) The End Semester Examination paper is a typical 3 hour - 100 marks question paper. As mentioned earlier, references from Bloom's Taxonomy are taken to challenge the various engineering skills appropriate for the said course while setting the paper. The score out of 100 is

converted to an equivalent score out of 60.

d) Mode of evaluation for laboratory course

For a typical laboratory course, the student earns an appropriate grade based on the marks scored during the course of the Semester. The formative and summative assessment components are combined to generate the total marks out of 100. The breakup is as under:-

Parameter	Marks
i) In Semester Assessment	70
ii) End Semester Assessment	30
TOTAL	100

i) The In Semester Assessment (ISA) is the formative mode used for assessment of performances in each laboratory assignment. A typical laboratory course contains 10 experiments. Assessment out of 10 marks is carried out for each experiment.

The total 100 marks thus obtained, are converted to 70 in the final calculations.

ii) **The End-Semester assessment is carried out by means of practical examination** or oral examination appropriate to the nature of laboratory course. Typically, the student performance is evaluated out of 100 marks.

The total 100 marks thus obtained, are converted to 30 in the final calculations. **Any student securing less than 50 marks ('F' grade) in sessional may be allowed to repeat the sessional in the corresponding semester of the subsequent year. This will be limited to only one chance.**

e) Mode of evaluation for seminar (Semester I and II of every year)

The students give a technical seminar in 5th Semester B.Tech. The Seminar progress is reviewed during the Mid-Semester Examination as per the academic calendar. For poor performing students identified by the examination panel, a second review is taken. In the reviews, the applicability along with the relevance of the topic, etc. is discussed. The

seminar is presented at the end of the semester. The seminar evaluation scheme is as under:-

Parameter	Marks
i) Attendance during Semester	10
ii) Attendance during Seminar presentation – Self and Peer	10
iii) Relevance of Seminar topic	10
iv) Timely abstract submission	10
v) Literature review	10
vi) Technical contents	10
vii) Presentation	25
viii) Question and Answer Session	15
TOTAL	100

Minimum score for a Pass in Seminar item shall be 50 percentage points. Any student securing less than 50 marks ('F' grade) in seminar may be allowed to repeat the seminar in the corresponding semester of the subsequent year. This will be limited to only one chance.

f) Mode of evaluation for Mini Project

Mini projects are carried out by students of 1st Semester B.Tech. to 5th Semester B.Tech.

In each semester based on the relevant courses registered in that semester. Group formation, discussion with faculty advisor, formation of the mini project statement, resource requirement identification and implementation of the mini project using laboratory resources is carried out systematically

50 marks are awarded as continuous assessment for the activities mentioned above.

Based on the submitted Mini-Project report, Oral Presentation and demonstration before a panel of examiners at the end of the semester, 50 marks are awarded as End Semester Assessment. The overall score out of 100 is considered for allocation of appropriate grade. **Minimum score for a Pass in Project item is 50 percentage points.**

g) Mode of evaluation for Comprehensive Viva Voce

A comprehensive viva voce is carried out after the End Semester Examination for S.Y. B.TECH. and T.Y. B.TECH. students. It is based on the appropriate theory and / or laboratory courses identified by the respective Board of Studies. An expert from industry / faculty is appointed as the external examiner.

An overall evaluation out of 100 is carried out by the panel. A separate passing head is assigned for comprehensive viva voce, i.e. the student may clear the relevant theory courses / laboratory courses but, may have to carry a backlog of the comprehensive viva voce based thereupon, owing to the lack of performance in the viva voce. **Minimum score for a pass in Viva - Voce is 50 percentage points.**

h) Mode of evaluation for Major Project

The major project activity is carried out starting from 6th Semester B.Tech. The major project comprises 3 stages. Stage I is carried out in 6th Semester B.Tech., Stage II is carried out in 7th Semester B.Tech. and Stage III is carried out in 8th Semester B.Tech.

In the major project, the student group is expected to apply the engineering principles learnt during the studies and produce a result oriented output.

The evaluation of project stage I (6th Semester B.Tech.) is based on the following parameters :-

Parameter	Marks
i) Group formation and attendance / reporting to guide	20
ii) Topic finalisation / Topic statement	20
iii) Literature survey	20
iv) Abstract	20
v) Presentation	20
TOTAL	100

Project Stage II and Project Stage III evaluations are based on following points:

Parameter	Marks
i) Understanding the relevance, scope	10

and dimension of the project	
ii) Relation to literature/Application	10
iii) Methodology	10
iv) Quality of Analysis and Results	10
v) Interpretation and Conclusion	20
vi) Report	20
vii) Defence	20
TOTAL	100

The evaluation will be done by a committee of Teachers where the Project Supervisor shall be a member. There shall be one external Expert from an Academic Institution / Industry **for 8th Semester only**. The Head of the respective Department / Section will be the Chairman of the Committee. The weightage of marks are 50% by the Project Supervisor and other 50% by the External Expert. **Minimum score for a Pass in Project item is 50 percentage points.**

i) Grading Scheme

The marks obtained by the student in various courses as per the assessment scheme mentioned above are graded relatively. The Institute offers the following 7 passing grades and 2 failure grades along with some specific grades for detention, absenteeism, etc. The grading system is as follows :-

Letter Grade	Grade Point	Performance	Score on 100 percentage point
O	10	Outstanding	90 and above upto 100
E	9	Excellent	80 and above but less than 90
A	8	Very Good	70 and above but less than 80
B	7	Good	60 and above but less than 70
C	6	Fair	50 and above but less than 60
D	5	Pass	37 and above but less than 50
FR	0	Fail (Permitted to repeat ESE)	Below 37
FF	0	Fail (Re-register the course)	Below 37 in the Summer Quarter

AP	0	Audit Course Passed	
S	0	Absent	
XX	0	Detained (Re-register the course)	
M	0	Mal practice	
PP	0	Passed (Only for Non-Credit courses)	
NP	0	Not Passed (Only for Non-Credit courses)	

The students are given XX grade on account of non-compliance to the **attendance** norms set up by **affiliating University which is 75% or above.**

j) Calculation of Semester Performance Index (SPI) [SGPA]

Based on the grade obtained and its mapping with the Grade Point Average (GPA) as mentioned above, a Semester Performance Index (SPI) is calculated. A student having earned all the credits gets the SPI applicable for the performances in that semester. It is shown in the statement of grades provided to the student at the end of Semester

Case Study

Consider the performance of a student as under:-

Subject	Type	Credits	Letter Grade	Grade Point	Type
S1	TH	3	O	10	TH
S2	TH	3	E	9	TH
S3	TH	3	A	8	TH
S4	TH	3	E	9	TH
S5	OE	2	B	7	OE
P1	Lab.	1	E	9	Lab.
P2	Lab.	1	A	8	Lab.
T1	TU	1	O	10	TU
T2	TU	1	E	9	TU
GP3	GP	1	B	7	GP
CVV1	CVV	2	C	6	CVV
MP3	Proj.	2	A	8	Proj.

SPI is calculated as :

$$SPI = \frac{(GP_1 \times C_1) + (GP_2 \times C_2) + \dots + (GP_n \times C_n)}{C_1 + C_2 + \dots + C_n}$$

Therefore, for the case mentioned above, SPI would be

$$SPI = \frac{30 + 27 + 24 + 27 + 14 + 9 + 8 + 10 + 9 + 7 + 12 + 16}{23}$$

$$= \frac{193}{23} = 8.39$$

K) Calculation of Cumulative Performance Index (CPI) [CGPA]

Based on the SPI obtained in each semester, a Cumulative Performance Index is calculated as the running average of SPI obtained till that Semester. The CPI obtained at the end of the 8th Semester is considered as the final CPI.

For the student admitted in First Year of Engineering, it is the running average of 8 SPIs from 1st Semester B.Tech. to 8th Semester B.Tech.

For the student admitted under Second Year Direct Admission (SEDA) (i.e. Lateral Entry), it is the running average of 6 SPIs from 3rd Semester B.Tech. to 8th Semester B.Tech.

Case Study

Consider the performances of a graduating student as under :-

Semester	SPI	CPI
1 st Semester B.Tech.	8.46	8.46
2 nd Semester B.Tech.	8.74	8.60
3 rd Semester B.Tech.	9.02	8.74
4 th Semester B.Tech.	8.84	8.77
5 th Semester B.Tech.	9.12	8.84
6 th Semester B.Tech.	8.62	8.80
7 th Semester B.Tech.	9.06	8.84
8 th Semester B.Tech.	9.24	8.89
FINAL CPI	8.89	

A consolidated Statement of Grades is provided to

the student upon completion of minimum credit requirement at the time of graduation. The consolidated statement of grades shows the performance of the student in all courses registered for during the 8 semesters. It also states the performance of the candidate in other optional courses such as Honors / Minor stream, sit-through courses, audit courses, additionally registered courses, etc.

This unique document helps the student showcase the overall performances, the subject studied alongwith other details.

I) Measures to control Academic Malpractices

Every student during the term of the examination is under the disciplinary jurisdiction of the competent authority that takes appropriate action in case of indiscipline or misconduct on part of student.

The competent authority during the actual conduct of examination appoints a junior supervisor, senior supervisor & flying squad and ensures that examinations are conducted as per the laid down norms. It also checks the students trying to take resort to malpractice at the time of examination. The squad also ensures that only the duly authorized candidates have appeared for the *concerned examinations*.

A Malpractice (MP) Committee handles the cases of malpractice reported by the supervisors or flying squad. The Committee handles various types of malpractices resorted to by the students such as possession of copying material, actual copying from the copying material, possession of another student's answer book, mutual copying, etc. A reasonable opportunity including oral hearing is given to the student in his / her defense before the Committee. The Committee then submits its recommendation to the competent authority which, in turn, issues final orders with regards to suitable penal action such as annulment of performance of the student in full or in part in the examination,

debarring the student from appearing for any examination, imposing fine as an additional punishment, etc.

m) Answer script retention

Answer scripts for subjective examination are stored for a period of **One Academic Year** after the examination by the Examination Section

n) Re-evaluation

Re-evaluation requests are accepted for subjective type examinations conducted by the Examination Section. An examinee may apply for re-evaluation after paying the fees, within the period given in the notice after the declaration of the ESE result. Answer scripts are re-evaluated by another examiner. After re-evaluation, grades are declared and are displayed for students, in case of no change or otherwise.

o) Class Improvement

CPI improvement will be allowed subject to :

- (1) (a) Student who has earned all prerequisite credits as applicable and are otherwise eligible to be awarded the Bachelor's Degree and declared pass.
- (b) Student: with $CPI < 6.75$
- (c) has submitted previous Grade Sheet and Degree Certificate to College Office.
- (d) has minimum 75% attendance for all Theory Courses considered for CPI improvement.
- (e) has satisfactorily completed teaching – learning process for every registered course and has undergone all In Semester and End Semester Assessments.
- (f) has appeared for T.Y. B.TECH. & FINAL YEAR B.TECH. Theory Courses adding upto minimum $1/3^{rd}$ credits of Theory Courses rounded upto next integer.
- (g) has submitted undertaking to College Office about CPI Improvement Rules.

(2) CPI improvement will be permitted **within 3 years** after completion of graduation.

(3) Maximum 3 attempts will be allowed for CPI improvement.

(4) The Student has to **re-register** for minimum number of credits equal to $1/3^{rd}$ of the total Theory Credits for Third Year and Final Year Courses offered by Board of Studies at the time of Class improvement attempt taken together, rounded off upto next integer.

(5) One attempt is equal to registration for minimum number of credits as mentioned above

(6) For every attempt the student must register for the minimum number of credits.

(7) *Student CPI improvement will be considered for :*

Case- 1 : Student having previous $CPI < 6.25$ and after improvement CPI is equal to or more than 6.25 or otherwise the performance for this attempt will be made Null & Void.

Case- 2 : Student having previous $CPI < 6.75$ and after improvement CPI is equal to or more than 6.75 or otherwise the performance for this attempt will be made Null & Void.

p) Examination and assessment policy for unsuccessful students

i) For securing admission to Third Year (5th Semester B.Tech.), the student must have earned all the credits of First Year (1st and 2nd Semester B.Tech.).

ii) For securing admission to Final Year (7th Semester B.Tech.), the student must have earned all the credits of Second Year (3rd and 4th Semester B.Tech..)

iii) In case of "FR" grade, the option is given to the student about retaining in-semester assessment marks or re-registration for the entire course, as and when the course is

offered.

- iv) The student failing to meet condition
- (i) or (ii) above, is expected to re-register upto **30 credits** in a semester (FF and FR taken together) for the backlog courses during the next academic year as and when the courses are offered and examinations are conducted. Once the said credits are earned, the student may register for courses of the next year (5th Semester B.Tech. or 7th Semester B.Tech. as applicable) only in the subsequent academic year.

q) Extra Credits

A student planning to take extra credits may be considered under following categories:

- (a) *A student carrying a backlog and re-registering for the previous course – Re-registration charges as applicable. Consideration of all courses registered for during that Semester of Academic Year for SPI calculation.*

- (b) Student planning to take extra courses as a **fast track opportunity** – Administration, processing and examination charges will be considered. In any case the student has to pay the college fees for four years. This **fast track** facility would enable the student to undergo an industrial training, an exchange programme, research contribution in I.I.T. under scheme such as **Kishore Vaigyanik Protsahan Yojana (KVPY)** without any academic compromises for **credit transfer**. The phase wise development and completion of project activity cannot be considered at an accelerated pace under fast track scheme. **The registration under fast track is subject to having a CPI 8.0 or above and no backlog for consideration of registration to an additional course.**

- (c) *Students opting for earning extra credits by*

selection of courses in addition to the courses prescribed by respective BOS, which are single Semester activities and not the part of Honors / Minor scheme. Such students will be expected to pay charges equivalent to re-registration (proportionate credit based payment). The registration for such courses is subject to permission given by the Chairman BOS of the Board in the purview of which the subject is identified. Such permissions will be given based on meeting with prerequisite subject.

- 1. In any case (a), (b) or (c) the candidate cannot register for more than 8 credits.
- 2. A suitable reflection of completion of the said course will be made in the candidate's Grade statement.

For part (c) a separate grade & GPA will be calculated. That GPA will not be clubbed with the other regular courses for SPI, CPI calculation.

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APPENDIX – A

List of General Proficiency Courses offered to F.Y. B.Tech. AY 2015-16

Course Code Name of Course

HS15320	Flute
HS15321	Guitar
HS15322	Tabla
HS15323	Bharat Natyam
HS15324	Odishi
HS15325	Classical Vocal
HS15326	Yoga
HS15327	Pranayam
HS15328	Aerobics
HS15329	Photography
HS15330	Digital Photography
HS15331	Film Appreciation
HS15332	Volleyball
HS15333	Chess
HS15334	Taekwondo
HS15335	Swimming
HS15336	Fundamentals of Banking
HS15337	Nutrition and Fitness
HS15338	Business English Certificate (BEC)

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APPENDIX – B

General Proficiency Courses for S.Y.B.Tech.

Course Code	Name of the Course
HS25301	Campus Recruitment Training
HS25303	Corporate Craft
HS25304	Corporate Soft Skills
HS25305	CRT : Foundation Workshop IT
HS25306	CRT : Foundation Workshop Non IT
HS25307	Digital Photography
HS25308	Floor Exercise
HS25309	Guitar
HS25310	Flute
HS25311	Numerology
HS25314	Photography
HS25317	Self Defense : Taekwondo
HS25318	Spirit of Entrepreneurship
HS25319	Synthesizer
HS25320	Volleyball
HS25321	Yoga
HS25322	Film Appreciation – Understanding Cinema
HS25323	Business Communication through effective presentation
HS25324	Aerobics
HS25325	Yoga and Pranayam

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Appendix – C

List of Open Elective Courses offered to F.Y. B. Tech

Course Code	Name of Course
HS16101	Sociology
HS16102	Economics
HS16103	Psychology
HS16104	Management Technology
HS16105	Philosophy
HS16106	Cost and Accounting
HS16107	Environmental Studies
HS16108	Business Law

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APPENDIX – D

Glossary of Terms

<i>Academic Flexibility</i>	Choice offered in the curriculum offering
<i>Admission Process</i>	Process of admitting students by a transparent well established and administered mechanism complying with all Government norms
<i>Academic Calendar</i>	The schedule of the Institute for the Academic Year giving details of all academic and other events
<i>Curriculum Design and Development</i>	Process of designing and developing appropriate curricula through a need assessment process and consultation with expert groups based on the feedback from the stake holders, resulting in the development of relevant courses to meet the professional and personnel needs of the students
<i>Choice Based Credit System</i>	Envisages facilities created for a learner to augment the credits by maximizing performance within a given time frame or outside. Only a wide range of course choice makes it feasible. Such a system is called Choice Based Credit System or a Cafeteria model.
<i>Elective Options</i>	A choice available to students to select from among a large number of courses
<i>Formative Assessment</i>	Frequent or ongoing evaluation during courses, programs and learning experiences that gives an early indication of what students are learning as well as their strengths and weaknesses. It is used as a diagnostic tool for students and faculty to make real time improvements in instructional methods, materials, activities, techniques and approaches
<i>Horizontal Mobility</i>	The option for movement of students within and across the disciplines
<i>Learning</i>	Acquisition of new knowledge or skills through evaluation, study, experience and innovation
<i>Mission</i>	It refers to the overall function of the organization. Mission answers the question “What is the Institute attempting to accomplish?” Mission defines students, stake holders, distinctive or core competencies
<i>Summative Assessment</i>	Formal and comprehensive analysis of the learning and performance of students covering global subject matter, typically conducted at the conclusion of course or program and used for determining final grades
<i>Teaching – Learning</i>	Learner centered education through appropriate methodologies to facilitate effective teaching and learning
<i>Vision</i>	It refers to the desired future state of the Institution. It describes what the Institute intends to be and how it wishes to be perceived in the future.

- Reference :-**
- 1) NAAC Manual for Self Study – Autonomous Colleges
 - 2) Indian Merchants Chamber Ramakrishna Bajaj National Quality Award Education Sector Information Brochure – 2010 - 2011

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APPENDIX – E

List of Abbreviations

Sr.No.	Abbreviation	Full Form
1.	A.B.	Academic Board
2.	B.Tech.	Bachelor of Technology
3.	B.O.M.	Board of Management
4.	B.O.S.	Board of Studies
5.	C.B.S.	Credit Based System
6.	C.P.I.	Cumulative Performance Index
7.	C.V.V.	Comprehensive Viva Voce
8.	D.E.S.H.	Department of Engineering, Sciences and Humanities
9.	E&T	Engineering and Technology
10.	E&TC	Electronics & Telecommunication
11.	EL	Elective
12.	E.R.C.	Engineering Research Centre
13.	F.Y.B.Tech.	First Year Bachelor of Technology
14.	G.E.M.	Groupe Des Ecoles Des Mines
15.	G.P.	General Proficiency
16.	G.P.A.	Grade Point Average
17.	H.S.S.	Humanities and Social Sciences
18.	M.C.A.	Master of Computer Applications
19.	M.D.	Multi-Disciplinary
20.	M.Tech.	Master of Technology
21.	MoU	Memorandum of Understanding
22.	M.P.	Mini Project
23.	NP	Not Passed
24.	O.E.	Open Elective
25.	O.M.G.	Ontario-Maharashtra-Goa
26.	P	Passed
27.	P.D.	Professional Development
28.	P.E.O.	Programme Educational Objectives
29.	P.G.	Post Graduate
30.	Ph.D.	Doctor of Philosophy
31.	S&M	Sciences and Mathematics
32.	S.D.	Skill Development
33.	S.Y.B.Tech.	Second Year Bachelor of Technology
34.	SEDA	Second Year Direct Admission
35.	S.P.I.	Semester Performance Index
36.	T.Y.B.Tech.	Third Year Bachelor of Technology
37.	U.G.	Under Graduate

