

# JOGINPALLY B R ENGINEERING COLLEGE

(Approved by AICTE & Affiliated to JNTU, Hyderabad)

Bhaskar Nagar, Yenkapally, Moinabad-500075,

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## HAND BOOK 2017-2018

Name (Student/ Staff): .....

Regd. Number/ Designation : .....

Department/ Branch : .....

Mobile No.	:	
Local address for Communication	:	



**IMPORTANT NOTE:** This book contains information for the  
Academic Year 2017-18

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## 1. Vision & Mission of the College

### Vision

- To be a global leader in educational and research institution in Engineering and Management.

### Mission

- To impart high quality technical and professional education in order to mould the learners into globally competitive professionals who are professionally deft, intellectually adept and socially responsible.
- To collaborate with industries and research organizations and excel in the emerging area of research

## 2. About J.B.R. Education Society

Joginpally B.R. EDUCATION SOCIETY was established in the year 1993 with the objectives to found and run the Educational & Cultural Institutions.

Distinguished Office Bearers of the Society:

<b>Chairman</b>	<b>Late. Shri. J. Bhaskar Rao</b>
<b>Secretary</b>	<b>Sri. J. Vamsidhar Rao</b>
<b>Director</b>	<b>Smt. J. Gayatri</b>

### Institutions run by the Society:

<b>Sl.No</b>	<b>Name of the Institute</b>	<b>Establishment</b>
1	JB Institute of Engineering & Technology( <b>Autonomous</b> )	1998
2	Joginpally B.R. Engineering College	2002
3	Bhaskar Medical College	2005
3	Bhaskar Engineering College	2007
4	Bhaskar Pharmacy College	2007
5	Joginpally B.R.Pharmacy College	2007
6	J.B.R Architecture College	2012
7	Sri Balaji Dental College	2015

The management members are imbued with a spirit of selfless service and believe in the principle of Academic autonomy. Transparency of all financial transactions is strictly adhered and all payments and receipts are through DD's and Cheques only. The Management obtains objective feedback about all aspects of the college and suitably advises and motivates employees in a discrete manner.

### 3. Messages

#### MESSAGE OF THE CHAIRMAN

Late. Shri. J. Bhaskar Rao



Congratulations to all the students who secured admission in our Institution to pursue their B.Tech course. Joginpally B R Engineering College has been the first choice for engineering aspirants since its inception in 2002 and gained reputation as abode of GATE rank achievers. The saga of success is scripted by the efforts of students and diligence of members of faculty. I wish all the students to utilize the infrastructure and the experienced faculty of our institution to equip themselves with modern knowledge and innovative skills that make them lead the nation in to new heights of advancement and development to enrich every citizen's life.

#### MESSAGE OF THE SECRETARY

Sri.J. Vamsidhar Rao



I welcome you all to the prestigious and glorious technical institution that has been carving students in to world renowned engineers with rich ethical values for the last three decades.

The college is enriched with well established library that caters to the needs of modern student. The institution is a hub of Student clubs that helps them to gratify their creative and innovative minds and weaving social responsibility with leadership qualities among students.

I wish you all the success in your endeavours to become a global engineer.

#### MESSAGE OF THE PRINCIPAL

Dr. V. Usha Shree



Welcome to Joginpally B R Engineering College. The college started in the year 2002 and is regarded as one of the best engineering colleges in the state of Telangana.

The teaching learning process in the campus is meticulously planned and effectively implemented by the Heads of the Departments with the able support of the faculty members. Continuous evaluation backed by remedial classes, student counselling and parent interactions form the nucleus of the teaching learning process.

The students of the college continuously excel in national and international competitive examinations like GATE, GRE and TOEFL. JBREC in its efforts to take class room teaching to world class level has introduced OBE based learning. The college provides Campus Recruitment Training and Placement Programme for the final year students and has good placement record for the past five years. The college also provides amenities like subsidized transportation, food court, mineral water, internet, bank, post office and ladies hostel, dispensary equipped with an ambulance for the convenience of faculty, staff and students. I feel this hand book is very useful to all the students and I would like to inform the students to bring this hand book to the college every day for referring the subject syllabus and the academic rules and regulations.

## 4. Academic Rules & Regulations for B. Tech Programme

### 4.1 Admissions:

**Admission into the First year of any Four Year B.Tech Programmes of study in Engineering:** Admissions into the first year of B.Tech Programme of Joginpally B R Engineering College (*Subsequently referred to as J.B.R.E.C*) will be as per the norms stipulated by JNTUH, Hyderabad and the Govt. of Telangana from time to time.

**Admission into the Second year of any Four year B.Tech Programmes of study in Engineering:** Admissions into the second year of B.Tech Programme of J.B.R.E.C will be as per the norms stipulated by JNTUH University and the Govt. of Telangana from time to time.

### 4.2 Duration of the programme and medium of instruction:

The duration of the B.Tech Programme is for four academic years consisting of two semesters in each academic year. The medium of instruction and examinations is English.

### 4.3 Programmes of study in B.Tech:

The Four year B.Tech Programme is offered in the following branches of study:

S.No.	Title of the UG Programme	Abbreviation
1.	Computer Science & Engineering	CS
2.	Electrical & Electronics Engineering	EE
3.	Electrical & Communication Engineering	EC
4.	Information Technology	IT
5.	Mechanical Engineering	ME

### 4.4 Academic Calendar 2017-18

#### I SEMESTER

S.No	EVENT	DATE	Duration
1.	Commencement of Instruction	12 <sup>th</sup> July 2017	--
2.	First Mid Term Examinations	6 <sup>th</sup> to 8 <sup>th</sup> Sept. 2017	--
3.	Submission of First Mid Term Exam Marks to University on or before	16 <sup>th</sup> Sept. 2017	--
4.	Dussehra recess	25 <sup>th</sup> to 30 <sup>th</sup> Sept. 2017	1 week
5.	Parent-Teacher Meeting	14 <sup>th</sup> Oct. 2017	--
6.	Second Mid Term Examinations	8 <sup>th</sup> to 10 <sup>th</sup> Nov. 2017	--
7.	Last date of Instruction	10 <sup>th</sup> Nov. 2017	16 weeks
8.	Preparation Holidays and practical Examinations	13 <sup>th</sup> to 18 <sup>th</sup> Nov. 2017	1 week
9.	Submission of Second Mid Term Exam Marks to University on or before	18 <sup>th</sup> Nov. 2017	--
10.	End Semester & Supplementary Examinations (II Sem. of I, II & III years)	20 <sup>th</sup> Nov. to 12 <sup>th</sup> Dec. 2017	3 weeks

## II SEMESTER

S.No	EVENT	DATE	Duration
1.	Commencement of Instruction	14 <sup>th</sup> Dec. 2017	--
2.	First Mid Term Examinations	7 <sup>th</sup> to 9 <sup>th</sup> Feb. 2018	--
3.	Submission of First Mid Term Exam Marks to University on or before	17 <sup>th</sup> Feb. 2018	--
4.	Parent-Teacher Meeting	10 <sup>th</sup> March 2018	--
5.	Second Mid Term Examinations	4 <sup>th</sup> to 7 <sup>th</sup> Apr. 2018	--
6.	Last date of Instruction	7 <sup>th</sup> April 2018	16 weeks
7.	Submission of Second Mid Term Exam Marks to University on or before	13 <sup>th</sup> April 2018	--
8.	Preparation Holidays and practical Examinations	9 <sup>th</sup> to 14 <sup>th</sup> April 2018	1 week
9.	End Semester & Supplementary Examinations (II Sem. of I, II & III years)	16 <sup>th</sup> April to 7 <sup>th</sup> May 2018	3 weeks
10.	Summer Vacation	8 <sup>th</sup> May to 7 <sup>th</sup> July 2018	9 weeks

### 4.5 B.Tech. Programme structure

A student after securing admission shall pursue the under graduate programme in B.Tech. in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** 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.

Each semester is structured to provide 24 credits, totaling to 192 credits for the entire B.Tech. programme.

Each student shall secure 192 credits (with CGPA  $\geq 5$ ) required for the completion of the under graduate programme and award of the B.Tech. degree.

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

### Semester scheme

Each under graduate programme is of 4 academic years (8 semesters) with the academic year being divided into two semesters of 22 weeks ( $\geq 90$  instructional days) each, each semester having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated by UGC and curriculum / course structure as suggested by AICTE are followed.

### Credit courses

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.

One credit for one ehour/week/semester for theory/lecture (L) courses

One credit for two hours/ week/ semester for laboratory/ practical (P) courses or tutorials (T)

Courses like Environmental Science, Professional Ethics, Gender Sensitization lab and other

student activities like NCC/NSO and NSS are identified as mandatory courses. These courses will not carry any credits.

#### 4.6 Subject Course Classification

All subjects/ courses offered for the under graduate programme in E&T (B.Tech. degree programmes) are broadly classified as follows. The university has followed almost all the guidelines issued by AICTE/UGC.

S. No.	Broad Course Classification	Course Group/ Category	Course Description
1	Foundation Courses (FnC)	BS – Basic Sciences	Includes mathematics, physics and chemistry subjects
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 (CoC)	PC – Professional Core	Includes core subjects related to the parent discipline/ department/ branch of Engineering.
5	Elective Courses (ElC)	PE – Professional Electives	Includes elective subjects related to the parent discipline/ department/ branch of Engineering.
6		OE – Open Electives	Elective subjects which include inter-disciplinary subjects or subjects in an area outside the parent discipline/ department/ branch of Engineering.
7	Core Courses	Project Work	B.Tech. project or UG project or UG major project
8		Industrial training/ Mini- project	Industrial training/ Internship/ UG Mini-project/ Mini-project
9		Seminar	Seminar/ Colloquium based on core contents related to parent discipline/ department/ branch of Engineering.
10	Minor courses	-	1 or 2 Credit courses (subset ofHS)
11	Mandatory Courses(MC)	-	Mandatory courses (non-credit)

#### 4.7 Course registration

A ‘faculty advisor or counselor’ shall be assigned to a group of 15 students, who will advise student about the under graduate programme, its course structure and curriculum, choice/option for subjects/ courses, based on their competence, progress, pre-requisites and interest.

The academic section of the college invites ‘registration forms’ from students before the beginning of the semester through ‘on-line registration’, ensuring ‘date and time stamping’. The on-line registration requests for any ‘current semester’ shall be **completed**

**before the commencement of SEEs (Semester End Examinations) of the ‘preceding semester’.**

A student can apply for **on-line** registration, **only after** obtaining the ‘**written approval**’ from faculty advisor/counselor, which should be submitted to the college academic section through the Head of the Department. A copy of it shall be retained with Head of the Department, faculty advisor/counselor and the student.

A student may be permitted to register for the subjects/ courses of **choice** with a total of 24 credits per semester (minimum of 20 credits and maximum of 28 credits per semester and permitted deviation of  $\pm 17\%$ ), based on **progress** and SGPA/ CGPA, and completion of the ‘**pre-requisites**’ as indicated for various subjects/ courses, in the department course structure and syllabus contents. However, a **minimum** of 20 credits per semester must be registered to ensure the ‘**studentship**’ in any semester.

Choice for ‘additional subjects/ courses’ to reach the maximum permissible limit of 28 credits (above the typical 24 credit norm) must be clearly indicated, which needs the specific approval and signature of the faculty advisor/counselor

If the student submits ambiguous choices or multiple options or erroneous entries during on-line registration for the subject(s) / course(s) under a given/ specified course group/category as listed in the course structure, only the first mentioned subject/ course in that category will be taken into consideration.

Subject/ course options exercised through **on-line** registration are final and **cannot** be changed or interchanged; further, alternate choices also will not be considered. However, if the subject/ course that has already been listed for registration by the Head of the Department in a semester could not be offered due to any unforeseen or unexpected reasons, then the student shall be allowed to have alternate choice either for a new subject (subject to offering of such a subject), or for another existing subject (subject to availability of seats). Such alternate arrangements will be made by the head of the department, with due notification and time-framed schedule, within the **first week** after the commencement of class-work for that semester.

Dropping of subjects/ courses may be permitted, only after obtaining prior approval from the faculty advisor/ counselor (subject to retaining a minimum of 20 credits), ‘**within a period of 15 days**’ from the beginning of the current semester.

**Open electives:** The students have to choose one open elective (OE-I) in III year I semester, one (OE-II) in III year II semester, and one (OE-III) in IV year II semester, from the list of open electives given. However, the student cannot opt for an open elective subject offered by their own (parent) department, if it is already listed under any category of the subjects offered by parent department in any semester.

**Professional electives:** students have to choose professional elective (PE-I) in III year II semester, Professional electives II, III, and IV (PE-II, III and IV) in IV year I semester, Professional electives V, and VI (PE-V and VI) in IV year II semester, from the list of professional electives given. However, the students may opt for professional elective subjects offered in the related area.



#### **4.8 Attendance requirements:**

A student shall be eligible to appear for the semester end examinations, if student acquires a minimum of 75% of attendance in aggregate of all the subjects/courses (excluding attendance in mandatory courses Environmental Science, Professional Ethics, Gender Sensitization Lab, NCC/NSO and NSS) for that semester.

Shortage of attendance in aggregate upto 10 % (65% and above, and below 75%) in each semester may be condoned by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.

A stipulated fee shall be payable towards condoning of shortage of attendance.

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

Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester. They get detained and their registration for that semester shall stand cancelled. They will not be promoted to the next semester. They may seek re-registration for all those subjects registered in that semester in which student was detained, by seeking re-admission into that semester as and when offered; in case if there are any professional electives and/ or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the same set of elective subjects offered under that category.

A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

#### **4.9 Academic requirements**

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned above.

A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course, if student secures not less than 35% marks (26 out of 75 marks) in the semester end examination, and a minimum of 40% of marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of letter grades, this implies securing 'C' grade or above in that subject/ course.

A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to UG mini-project and seminar, if student secures not less than 40% marks (i.e. 40 out of 100 allotted marks) in each of them. The student would be treated as failed, if student (i) does not submit a report on UG mini-project, or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) does not present the seminar as required in the IV year I Semester, or (iii) secures less than 40% marks in UG mini-project/ seminar evaluations. Student may reappear once for each of the above evaluations, when they are scheduled again; if student fails in such 'one reappearance' evaluation also, student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

#### 4.10 Promotion Rules

S. No.	Promotion	Conditions to be fulfilled
1	First year first semester to first year second semester	Regular course of study of first year first semester.
2	First year second semester to second year first semester	<ul style="list-style-type: none"><li>i. Regular course of study of first year second semester.</li><li>ii. Must have secured at least 24 credits out of 48 credits i.e., 50% of credits up to first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.</li></ul>
3.	Second year first semester to second year second semester	Regular course of study of second year first semester.
4	Second year second semester to third year first semester	<ul style="list-style-type: none"><li>i. Regular course of study of second year second semester.</li><li>ii. Must have secured at least 58 credits out of 96 credits i.e., 60% of credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.</li></ul>
5	Third year first semester to third year second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	<ul style="list-style-type: none"><li>i. Regular course of study of third year second semester.</li><li>ii. Must have secured at least 86 credits out of 144 credits i.e., 60% of credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.</li></ul>
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

A student shall register for all subjects covering 192 credits as specified and listed in the course structure, fulfills all the attendance and academic requirements for 192 credits, 'earn all 192 credits' by securing SGPA  $\geq 5.0$  (in each semester) and CGPA (at the end of each successive semester)  $\geq 5.0$  to successfully complete the under graduate programme.

After securing the necessary 192 credits as specified for the successful completion of the entire under graduate programme, the student can avail exemption of two subjects up to 6 credits, that is, one open elective and one professional elective subject or two professional elective subjects for optional drop out from these 192 credits earned; resulting in 186 credits for under graduate programme performance evaluation, i.e., the performance of the student in these 186 credits shall alone be taken into account for the calculation of 'the final CGPA (at the end of under graduate programme, which takes the SGPA of the IV year II semester into account)', and shall be indicated in the grade card of IV year II semester. However, the

performance of student in the earlier individual semesters, with the corresponding SGPA and CGPA for which grade cards have already been given will not be altered.

If a student registers for some more ‘**extra subjects**’ (in the parent department or other departments/branches of engg.) other than those listed subjects totaling to 192 credits as specified in the course structure of his department, the performances in those ‘**extra subjects**’ (although evaluated and graded using the same procedure as that of the required 192 credits) will not be taken into account while calculating the SGPA and CGPA. For such ‘**extra subjects**’ registered, % of marks and letter grade alone will be indicated in the grade card as a performance measure, subject to completion of the attendance and academic requirements as stated in regulations 6 and 7.1 – 7.5 above.

A student eligible to appear in the end semester examination for any subject/ course, but absent from it or failed (thereby failing to secure ‘**C**’ grade or above) may reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, CIE assessed earlier for that subject/ course will be carried over, and added to the marks to be obtained in the SEE supplementary examination for evaluating performance in that subject.

A student **detained in a semester due to shortage of attendance, may be re-admitted when the same semester is offered in the next academic year for fulfillment of academic requirements.** The academic regulations under which student has been readmitted shall be applicable. However, no grade allotments or SGPA/ CGPA calculations will be done for the entire semester in which student has been detained.

A student **detained due to lack of credits, shall be promoted to the next academic year only after acquiring the required academic credits.** The academic regulations under which student has been readmitted shall be applicable to him.

### **Evaluation - Distribution and Weightage of marks**

The performance of a student in every subject/course (including practicals and UG major project) will be evaluated for 100 marks each, with 25 marks allotted for CIE (Continuous Internal Evaluation) and 75 marks for SEE (Semester End-Examination).

For theory subjects, during a semester, there shall be two mid-term examinations. Each mid-term examination consists of one objective paper, one descriptive paper and one assignment. The objective paper and the essay paper shall be for 10 marks each with a total duration of 1 hour 20 minutes (20 minutes for objective and 60 minutes for essay paper). The objective paper is set with 20 bits of multiple choice, fill-in the blanks and matching type of questions for a total of 10 marks. The essay paper shall contain 4 full questions out of which, the student has to answer 2 questions, each carrying 5 marks. While the first mid-term examination shall be conducted on 50% of the syllabus, the second mid-term examination shall be conducted on the remaining 50% of the syllabus. Five marks are allocated for assignments (as specified by the subject teacher concerned). The first assignment should be submitted before the conduct of the first mid-examination, and the second assignment should be submitted before the conduct of the second mid examination. The total marks secured by the student in each mid-term examination are evaluated for 25 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each student in internals/sessionals. If any student is absent from any subject of a mid-term examination, an on-line test will be conducted for him by the university.

The details of the question paper pattern are as follows,

- The end semester examinations will be conducted for 75 marks consisting of two parts viz. i) **Part- A** for 25 marks, ii) **Part - B** for 50 marks.

- **Part-A** is compulsory question which consists of ten sub-questions. The first five Sub-questions are from each unit and carry 2 marks each. The next five sub questions are one from each unit and carry 3 marks each.
- **Part-B** consists of five questions (numbered from 2 to 6) carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an “either” “or” choice, which means that there will be two questions from each unit and the student should answer either of the two questions.

For practical subjects there shall be a continuous internal evaluation during the semester for 25 sessional marks and 75 semester end examination marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The semester end examination shall be conducted with an external examiner and the laboratory teacher. The external examiner shall be appointed from the clusters of colleges which are decided by the examination branch of the university.

For the subject having design and/or drawing, (such as engineering graphics, engineering drawing, machine drawing) and estimation, the distribution shall be 25 marks for continuous internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for semester end examination. There shall be two internal tests in a semester and the average of the two shall be considered for the award of marks for internal tests.

There shall be an UG mini-project, in collaboration with an industry of their specialization. Students will register for this immediately after III year II semester examinations and pursue it during summer vacation. The UG mini-project shall be submitted in a report form and presented before the committee in IV year I semester. It shall be evaluated for 100 marks. The committee consists of an external examiner, Head of the Department, supervisor of the UG mini-project and a senior faculty member of the department. There shall be no internal marks for UG mini-project.

There shall be a seminar presentation in IV year I semester. For the seminar, the student shall collect the information on a specialized topic, prepare a technical report and submit it to the department. It shall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 100 marks. There shall be no semester end examination for the seminar.

Out of a total of 100 marks for the UG major project, 25 marks shall be allotted for internal evaluation and 75 marks for the end semester examination (viva voce). The end semester examination of the UG major project shall be conducted by the same committee as appointed for the UG mini-project. In addition, the UG major project supervisor shall also be included in the committee. The topics for UG mini project, seminar and UG major project shall be different from one another. The evaluation of UG major project shall be made at the end of IV year II semester. The internal evaluation shall be on the basis of two seminars given by each student on the topic of UG major project.

The laboratory marks and the sessional marks awarded by the college are subject to scrutiny and scaling by the university wherever necessary. In such cases, the sessionals and laboratory marks awarded by the college will be referred to a committee. The committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective institutions as per the university rules and produced before the committees of the university as and when asked for.

For mandatory courses environmental science, professional ethics and gender sensitization lab, a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in the continuous internal evaluation for passing the subject/course.

For mandatory courses NCC/ NSO and NSS, a ‘satisfactory participation certificate’ shall be issued to the student from the authorities concerned, only after securing  $\geq 65\%$  attendance in such a course.

No marks or letter grade shall be allotted for all mandatory/non-credit courses.

#### 4.11 Grading procedure

Marks will be awarded to indicate the performance of student in each theory subject, laboratory / practicals, seminar, UG mini project and UG major project. Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken together) as specified in item 8 above, a corresponding letter grade shall be given.

As a measure of the performance of student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed:

<b>% of Marks Secured in a Subject/Course (Class Intervals)</b>	<b>LetterGrade (UGC Guidelines)</b>	<b>GradePoints</b>
Greater than or equal to 90%	O (Outstanding)	10
80 and less than 90%	A <sup>+</sup> (Excellent)	9
70 and less than 80%	A (Very Good)	8
60 and less than 70%	B <sup>+</sup> (Good)	7
50 and less than 60%	B (Average)	6
40 and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

A student obtaining ‘**F**’ grade in any subject shall be deemed to have ‘**failed**’ and is required to reappear as a ‘supplementary student’ in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

A student who has not appeared for examination in any subject, ‘**Ab**’ grade will be allocated in that subject, and student shall be considered ‘**failed**’. Student will be required to reappear as a ‘supplementary student’ in the semester end examination, as and when offered.

A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

**Credit points (CP) = grade point (GP) x credits .... For a course**

The student passes the subject/ course only when **GP ≥ 5 ('C' grade or above)** The semester grade point average (SGPA) is calculated by dividing the sum of credit points ( $\Sigma CP$ ) secured from all subjects/ courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to **two** decimal places. SGPA is thus computed as

$$\text{SGPA} = \{ \sum_{i=1}^n C_i G_i \} / \{ \sum_{i=1}^n C_i \} \dots \text{For each semester}$$

where 'i' is the subject indicator index (takes into account all subjects in a semester), 'N' is the no. of subjects '**registered**' for the semester (as specifically required and listed under the course structure of the parent department), C is the no. of credits allotted to the i<sup>th</sup> subject, and G represents the grade points (GP) corresponding to the letter grade awarded for that i<sup>th</sup> subject.

The cumulative grade point average (CGPA) is a measure of the overall cumulative performance of a student in all semesters considered for registration. The CGPA is the ratio of the total credit points secured by a student in all registered courses in all semesters, and the total number of credits registered in all the semesters. CGPA is rounded off to **two** decimal places. CGPA is thus computed from the I year II semester onwards at the end of each semester as per the formula

$$\text{CGPA} = \{ \sum_{j=1}^M C_j G_j \} / \{ \sum_{j=1}^M C_j \} \dots \text{for all S semesters registered}$$

**(i.e., up to and inclusive of S semesters, S ≥ 2),**

where '**M**' is the **total** no. of subjects (as specifically required and listed under the course structure of the parent department) the student has '**registered**' i.e., from the 1<sup>st</sup> semester onwards up to and inclusive of the 8<sup>th</sup> semester, 'j' is the subject indicator index (takes into account all subjects from 1 to 8 semesters), C is the no. of credits allotted to the j<sup>th</sup> subject, and G represents the grade points (GP) corresponding to the letter grade awarded for that j<sup>th</sup> subject. After registration and completion of first year first semester, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

**Illustration of calculation of SGPA**

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
	21			152

$$\text{SGPA} = 152/21 = 7.24$$

### Illustration of calculation of CGPA:

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
<b>I Year I Semester</b>				
Course 1	4	A	8	4 x 8 = 32
Course 2	4	A+	9	4 x 9 = 36
Course 3	4	B	6	4 x 6 = 24
Course 4	3	O	10	3 x 10 = 30
Course 5	3	B+	7	3 x 7 = 21
Course 6	3	A	8	3 x 8 = 24
<b>I Year II Semester</b>				
Course 7	4	B+	7	4 x 7 = 28
Course 8	4	O	10	4 x 10 = 40
Course 9	4	A	8	4 x 8 = 32
Course 10	3	B	6	3 x 6 = 18
Course 11	3	C	5	3 x 5 = 15
Course 12	3	A+	9	3 x 9 = 27
	Total Credits = 42			Total Credit Points = 327

$$\text{CGPA} = 327/42 = 7.79$$

For merit ranking or comparison purposes or any other listing, **only** the ‘**rounded off**’ values of the CGPAs will be used.

For calculations listed in regulations 9.6 to 9.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/ courses will also be included in the multiplications and summations. After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA. However, mandatory courses will not be taken into consideration.

### Passing standards

A student shall be declared successful or ‘passed’ in a semester, if student secures a  $GP \geq 5$  (‘C’ grade or above) in every subject/course in that semester (i.e. when student gets an SGPA  $\geq 5.00$  at the end of that particular semester); and a student shall be declared successful or ‘passed’ in the entire under graduate programme, only when gets a CGPA  $\geq 5.00$  for the award of the degree as required.

After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

### Declaration of results

Computation of SGPA and CGPA are done using the procedure specified above. For final percentage of marks equivalent to the computed final CGPA, the following formula may be used.

$$\% \text{ of Marks} = (\text{final CGPA} - 0.5) \times 10$$

## 4.12 Award of degree

A student who registers for all the specified subjects/ courses as listed in the course structure and secures the required number of 192 credits (with CGPA  $\geq 5.0$ ), within 8 academic years from the date of commencement of the first academic year, shall be declared to have '**qualified**' for the award of the B.Tech. degree in the chosen branch of Engineering as selected at the time of admission.

A student who qualifies for the award of the degree as specified above shall be placed in the following classes.

- Students with final CGPA (at the end of the under graduate programme)  $\geq 8.00$ , and fulfilling the following conditions –
  - (i) Should have passed all the subjects/courses in '**first appearance**' within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.
  - (ii) Should have secured a CGPA  $\geq 8.00$ , at the end of each of the 8 sequential semesters, starting from first year first semester onwards.
  - (iii) Should not have been detained or prevented from writing the end semester examinations in any semester due to shortage of attendance or any other reason, shall be placed in '**first class with distinction**'.

Students with final CGPA (at the end of the under graduate programme)  $\geq 6.50$  but  $< 8.00$ , shall be placed in '**first class**'.

Students with final CGPA (at the end of the under graduate programme)  $\geq 5.50$  but  $< 6.50$ , shall be placed in '**second class**'.

All other students who qualify for the award of the degree with final CGPA (at the end of the under graduate programme)  $\geq 5.00$  but  $< 5.50$ , shall be placed in '**pass class**'.

A student with final CGPA (at the end of the under graduate programme)  $< 5.00$  will not be eligible for the award of the degree.

Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of '**university rank**' and '**gold medal**'.

### **Withholding of results**

If the student has not paid the fees to the university/ college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

### **Transitory regulations**

A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects/ courses (or equivalent subjects/ courses, as the case may be), and same professional electives/ open electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).



## 5. Academic Regulations for B.Tech. (Lateral Entry Scheme) w.e.f the AY 2017-18

### 5.1 Eligibility for award of B. Tech. Degree (LES)

1. The LES students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years.
2. The student shall register for 144 credits and secure 144 credits with CGPA  $\geq 5$  from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree. **Out of the 144 credits secured, the student can avail exemption up to 6 credits**, that is, one open elective subject and one professional elective subject or two professional elective subjects resulting in 138 credits for B.Tech programme performance evaluation.
3. The students, who fail to fulfill the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.
4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

### 5.2 Promotion rule

S. No	Promotion	Conditions to be fulfilled
1	Second year first semester to second year second semester	Regular course of study of second year first semester.
2	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 29 credits out of 48 credits i.e., 60% of credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester to third year second semester	Regular course of study of third year first semester.
4	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 58 credits out of 96 credits i.e., 60% of credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

## **Code of conduct handbook exists for students**

### **The institution follows the following rules and regulations for students**

#### **6. Student Rules and Regulations**

- Students are subject to rules of conduct and behavior framed by the authorities of the College.
- College working hours are: 9.00 am to 12.30 pm, 1.20 pm to 3.50pm.
- The College discourages use of soft drinks. Wholesome food and drinks are available in the College Canteen, Cafeteria and the Hostel.
- Internal assessment is part of the evaluation. Please check the marks displayed on the notice board and bring any discrepancy to the notice of the Dean or HOD immediately. Change is not possible later.
- The College siren is given 10 minutes prior to the start of the morning and evening sessions. When you hear the siren, please hasten towards your class room. Except under special conditions, late comers are not allowed to enter class without a note from the Principal. Without the lecturer's permission students are not permitted to leave class.
- As per college regulations, 75% attendance is compulsory. Otherwise, students cannot appear for the University Examinations. Absence from class must be justified with the concerned Dean. Absence for more than three days for reasons of health requires a medical certificate. Producing a medical certificate however does not entitle a student to get attendance.
- Participation in co-curricular or extra-curricular activities inside or outside the campus is not counted as absence from class. Attendance will be counted only when a copy of the participation certificate or a note from the concerned teacher is produced immediately before the Dean (Academics) or an Officer authorized by him.
- It is necessary to score a minimum of 40% to pass in any subject in the semester examination.
- Three internal examinations are conducted for BE, MBA and marks of the best two are considered for internal assessment. Two internal examinations are conducted for MCA. Absence in two such tests, even with medical certificate, cannot entitle a student to double marks in the one test answered by them.
- The college takes note of serious misbehavior, insubordination, habitual tardiness, irregular work habits or obscenity which are punishable by fine, suspension or dismissal. The College is declared an alcohol-smoke-drug-free area and offenders face dismissal.
- Misbehavior outside the College, besides affecting the reputation of the College, has an impact on the student's community. The College reserves the right to take such action and make such rules is necessary in the interest of the general student community to deal with such misbehavior.
- The students are required to wear college Identity Card on all college working days. Failure to wear the college identity card will be treated as misconduct and such students will be barred from entering the campus and class room.
- Use of mobile phones is forbidden inside the academic blocks. The College has provided safe-lockers in different department for the convenience of the students. Students have to provide their own locks and the management is not responsible for their safety. Come sufficiently early to College so that you do not go late to class on account of it.
- The management is not responsible for the safety of valuables of students.
- The students are warned they must follow all the safety regulations while conducting practical in the laboratories and the management is not responsible for any physical damage or mishap that might occur out of students negligence.

- The marks card of the first internal test during the First Semester is given personally by the Dean to the parent/guardian within three weeks of the test. Marks cards of the other tests are sent by post. Parents/guardians are requested to carefully go through the marks and take steps to improve performance whenever necessary.
- First and Second Year B.Tech students are required to dress in the uniform stipulated by the College. MBA and MCA students are required to wear uniform on designated days. All students' are expected to be dressed neatly and decently. They are not expected to wear T-shirts and jeans in the campus.
- Every student is expected to display the identity card on his person for easy identification.
- Students' vehicles may be parked and locked in the allotted place only. However, the College is not responsible for their safety.
- During the mid-session break of 20 minutes between 10.50 am and 11.30 am, students are not allowed to leave the campus without written permission from the Principal.
- Students who do not live with their parents or in the College Hostel are required to inform the Principal about the details of their place of residence.
- No student is permitted to take part in agitations directed against the lawful authority of the Government. Membership of clubs or associations outside the campus and participation in public movements is undesirable. Students are not allowed to collect donation from the public for any purpose.
- Use of cell phones in the campus is banned by the VTU. Mere possession of a cell phone during university examinations may result in losing the exam.
- College fees are to be paid within two weeks of the reopening of semester classes. A late fee of Rs.500 is payable after that. If fees are not paid within four weeks after reopening, the name of the student will be struck from the rolls. Tuition and other fees once paid cannot be refunded. However, refund of deposit may be claimed.
- Change of permanent address must be notified to the College office.
- Those who wish to leave College for any reason will be given a TC only on payment of all fees payable for the remaining semesters and clearing any other dues. Such students have to return any scholarship, stipend or financial assistance given.

## **7. Regulations governing the malpractices by the students during internal/university examinations**

**Every student appearing for the Internal External/University Examination is liable to be charged with committing malpractice(s), if he/she is observed as committing any one or more of the following acts:**

1. Misbehavior with officials or any other kind of rude behavior in or near the Examination Hall and using obscene or abusing language.
2. Writing on the Question Paper and/or passing on the same to other student(s) in the Examination Hall.
3. Possession of electronic gadgets like mobile phones, programmable calculator, pen-drive or such other /storage devices in the Examination Hall.
4. Communicating with any other student(s) or any other person(s) inside or outside the Examination Hall with a view to take assistance or aid to write answers in the examination.
5. Copying from the material or matter or answer(s) of another student or from similar aid or assistance rendered by another student within the Examination Hall.
6. Making any request of representation or offer of any threat for inducement or bribery to Room Superintendent and/or any other official for favours in the Examination Hall or in the answer script.
7. Approaching directly or indirectly the teaching staff to bring about undue pressure or influence upon them for favour in the examination.
8. Taking away or Taking in the answer script pages or supplementary sheets or tearing them off and/or inserting pages written outside the examination hall into the answer scripts.
9. Receiving material from outside or inside the Examination Hall, for the purpose of copying (inclusive of electronic communication).
10. Bringing into the Examination Hall or being found in possession of portions of an unauthorized book, manuscript, or such other material or matter in the Examination Hall.
11. Copying or taking aid from any material or matter referred to in sub-clauses (h & i) above to answer in the examinations.
12. Impersonating or allowing any other person to impersonate to answer in his/her place in the Examination Hall.
13. Committing any other act or commission or omission intending to gain an advantage or favour in the examination by misleading, deceiving or inducing the examiner or official.
14. Having in one's possession any written matter on scribbling pad, calculator, plam, hand, leg or any other part of the body, hand kerchiefs, clothing, socks, instrument box, identity card, scales electronic gadgets etc.,
15. Destroying any evidence of malpractice, like tearing or militating the answer script(s) from the Examination Hall.

## 8. Introduction to Outcome Based Education and Accreditation

“**Outcomes Based Education**” (OBE) of Engineering qualifications gives recognition to graduates for the *knowledge, skills and attitudes/behaviours* they have acquired upon just completion of a programme and after 4 to 5 years of graduation. This system focuses on the Objectives and Outcomes of the Programme and requires evidence of measurement and attainment of Objectives and Outcomes.

**Outcome Based Accreditation (OBA)** is an Assessment of the Performance of the Program/Institution as per the Accreditation Criteria defined in terms of Objectives, Outcomes and other key Constituents.

**Outcome Based Curriculum (OBC)** is prepared keeping in mind that what the student should be able to do at end of the Programme.

**Outcome Based Learning & Teaching (OBLT)** methods are developed to make the student achieve the Outcomes.

**Outcome Based Assessments (OBA)** methods are designed to measure what the student has achieved at end of the Programme in terms of Knowledge, Skills, and Attitude/Behaviour.

### **Key Constituents of OBE:**

The Key Constituents of OBE are Vision, Mission, Programme Educational Objectives (PEO), Programme Outcomes (PO), Graduate Attributes (GA), Course Objectives (COB), Course Outcomes (CO), Assessments, Rubrics, Mapping, Evaluation and Grading.

### **Accreditation:**

It is an Assessment of the Performance of the Program/Institution as per the Accreditation Criteria.

It is an assurance that a Program or Institution meets established quality standards.

- Accreditation assures quality.
- It is a peer review process that assures the quality of post secondary education students receive.
- Educational institutions or program volunteer to undergo this review periodically to determine if certain criteria are being met.
- It is important to understand that accreditation is not a ranking system. It is simply assurance that a program or institution meets established quality standards.
- There are two types of accreditation- Institution and Program.
- Institutional accreditation evaluates overall institutional quality. One form of institutional accreditation is accreditation of Colleges and Universities. (National Assessment & Accreditation Council-NAAC under UGC)
- Program accreditation examines specific program of study rather than institution as a whole. (National Board of Accreditation-NBA under AICTE)

### **Importance and Significance of Accreditation:**

- \* To make the institute/department/program aware of the weaknesses of the program offered by it and act on suggestions for improvement.
- \* To encourage the institute to move continuously towards the improvement of quality of its program, and the pursuit of excellence.
- \* To facilitate institutions for updating themselves in program curriculum, teaching

- and learning processes, faculty achievements, students' skills/abilities/knowledge.
- \* To excel among stakeholders. (Students, faculty, alumni, employers, industries, government, regulators, management, etc.)
- \* To facilitate receiving of grants from Government regulatory bodies and institutions/agencies.
- \* To attain international recognition of accredited degrees awarded.
- \* To facilitate the mobility of graduated students and professionals.

## **Quality Assurance through Accreditation Achieving Excellence through Accreditation**

**“Quality Costs Money, Quality Brings Money”**

Quote by Dr. V. V. Rao

**PEOs, Pos, Gas, Cobs and Cos**

### **Approaches to Accreditation**

#### **1. Input-Output Based Education**

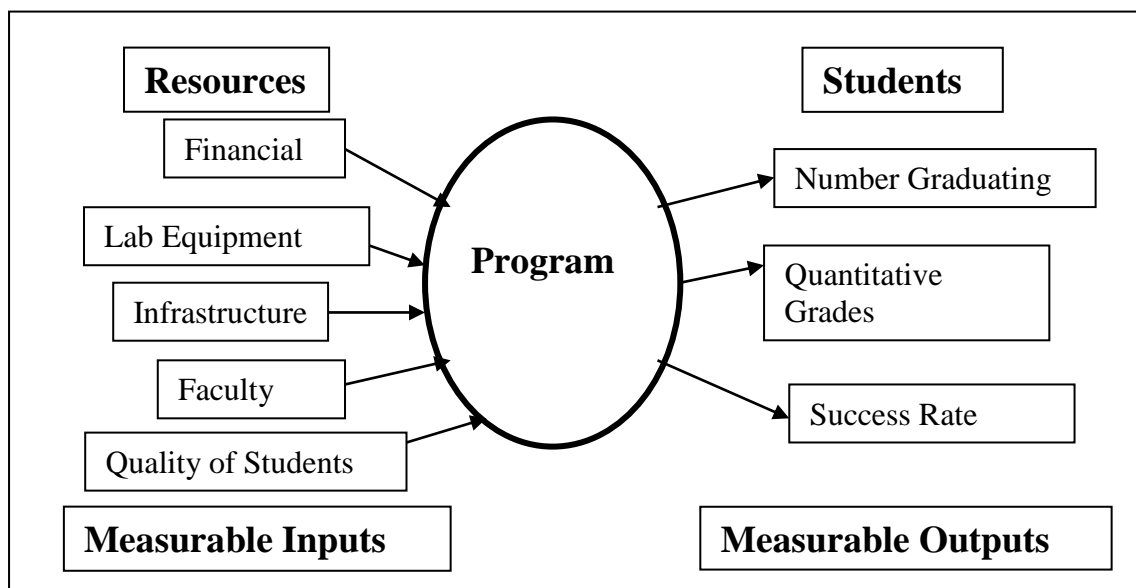
The **Input-Output Based Education** Model requires strict adherence to a core curriculum. This model often involves direct prescriptions of curriculum and faculty composition. It is teacher centric. It focuses on Inputs.

**This model has several advantages:**

- \* It makes the accrediting process uniform and potentially fair,
- \* Criteria are unambiguous and often numeric,
- \* Relatively easy to maintain
- \* The key to success lies in adherence to clear unambiguous rules.

**This model also has several serious drawbacks:**

- \* It is difficult to establish and update, it often leads to vigorous debates over what the “core” requirements should be.
- \* Lack of innovation and creativity in the curriculum
- \* Does not encourage continuous improvement in curriculum
- \* Assessment of Knowledge only



## 8.1 Outcome Based Education

The Outcomes-Based Model prescribes a “small” core curriculum and other basic requirements. It defines the basic parameters for the outcomes of the program. It does focus on the more specific outcomes and objectives declared by the program. The Outcomes-Based Model requires the measurement of outcomes, looking for evidence that these measurements have been used to foster a quality improvement process. It is student centric. It focuses on Outcomes.

### This model has several advantages:

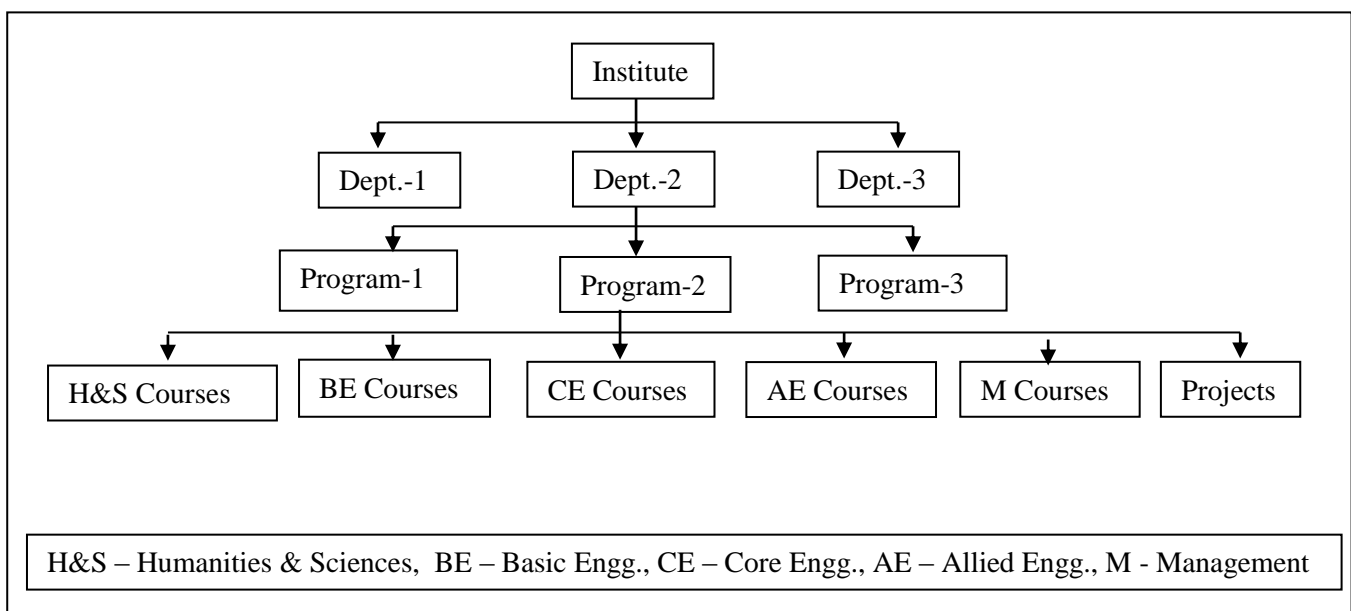
- \* Balance between various components of Curriculum
- \* Assessment of Knowledge, Skills and Attitudes of graduate
- \* Provides for significant diversity in outcomes and objectives.
- \* Focuses on the objectives and outcomes of the program
- \* Encourages continuous improvement in curriculum

### This model also has several serious drawbacks:

- \* Puts significant responsibility in the hands of the program leaders -- and therefore significant risk; some programs may try to achieve outcomes that are unattainable.
- \* Requires evidence of measurement and attainment of objectives and outcomes
- \* Too much data may be collected and analyzed periodically
- \* Disagreements and ambiguity about assessment and assessment tools tend to plague the process.
- \* The process of evaluating outcomes requires a high level of sophistication, as these can sometimes be difficult to measure and assess.
- \* Complaints on inconsistent evaluations may follow. Strong disagreements may arise about methodology and about the extent to which data need to be collected and analyzed.
- \* Extra burden on faculty, students and educational institutions.
- \* Additional preparation, homework, and continuing education time spent by students, parents and faculty in supporting learning.

### Institute and Courses relationship:

An **Institute** may have several **Departments** such as Mechanical Engineering, Electrical & Electronics Engineering, Electronics & Communication Engineering, Computer Science Engineering, etc.. Each Department may be conducting several **Programs** such as B.Tech. in any Engineering, M.Tech. in any Engineering, Diploma and Certificate programs. Each Program may have of several **Courses** such as shown in the flow diagram below. Each Course has a **Syllabus** with its contents.



## **Programme Educational Objectives (PEOs)**

Programme educational objectives are broad statements that describe what graduates are expected to attain within a few (3 to 5) years of graduation. Programme educational objectives are based on the needs of the program's constituencies and goals. PEOs should be consistent with the mission of the Program and the Institution.

PEOs are evolved / prepared in consultation with program's constituencies (Students, Faculty, Parents, Alumni, Industry, Management, Professional Bodies, Data on future, Data on trends in development in the profession, etc.

## **SMART OBJECTIVES and OUTCOMES**

Objectives / Outcomes are the building blocks or steps towards achieving a program's goals. Objectives / Outcomes are specific and concise statements that state *who* will make *what* change, by *how much*, *where* and by *when*.

**When writing Objectives and Outcomes, keep them SMART:**

SMART work objectives / outcomes are:

- **Specific** - Is it clear and well defined
- **Measurable** - Know if it is obtainable and how far away completion is
- **Achievable** - Agreement with all the stakeholders what it should be
- **Realistic** - Within the availability of resources, knowledge and time
- **Timely** - Enough time to achieve it, is there a time limit

## **Difference between Objectives and Outcomes:**

*Objectives* are intended results or consequences of instruction, curricula, programs, or activities. *Outcomes* are achieved results or consequences of what was learned; i.e., evidence that learning took place. Objectives are focused on specific types of performances that students are expected to demonstrate at the end of instruction.

Objectives are often written more in terms of teaching intentions and typically indicate the subject content that the teacher(s) intends to cover. It is teacher-centred. Learning outcomes, on the other hand, are more student/learner-centred and describe what it is that the learner should learn.

Objectives are derived from the mission statement and provide a focus for general performance expectations for graduates of the institution or program regardless of the graduates' major areas of study. Objectives direct the development of the student attributes (outcomes) needed to achieve the objectives. They facilitate the direction of educational strategies needed to instill in students the attributes (outcomes) needed to achieve the objectives.

## **Course / Subject Objectives(CObs)**

Course / Subject Objectives are statements that describe what students are expected to attain in terms of specific knowledge, skills, and attitudes after completing the course/subject. Course / Subject Objectives are based on the syllabus content of the course/subject. These are teacher-centred.

## **Course / Subject Outcomes (COs)**

Course / Subject Outcomes describe what students are expected to know and be able to do at the time of completion of the course/subject. These relate to the skills, knowledge, and behaviours/attitudes that the students / learners acquire as they progress through the course/subject. These are specific and be measurable. These are student/learner-centred.



In summary, **Course Outcomes (COs) are**

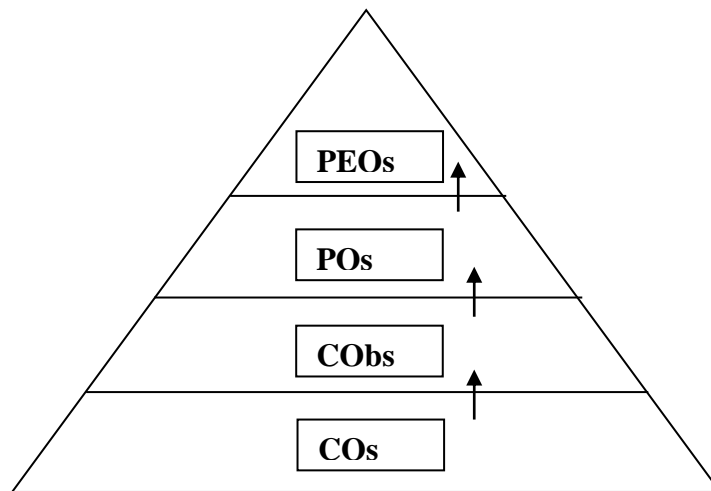
- \* Student-focused, not teacher-focused
- \* Aligned between course, program, and institutional levels
- \* Stated in terms of knowledge, skills, attitude or ability that students will acquire.
- \* Expressed in terms of measurable and/or observable behaviours
- \* Needed to reflect the objectives, outcomes and mission of the academic program
- \* Focused on abilities central to the discipline
- \* Focused on aspects of learning that will endure students new modes of thinking
- \* Limited to manageable number (say, 3-6) being accomplished within a semester
- \* To begin with an action verb (e.g., write, install, solve, and apply – Blooms Taxonomy).

**Course Objectives Vs Course Outcomes**

The following table summarizes the difference between course objectives and course outcomes.

<b>Course Objectives</b>	<b>Course Outcomes</b>
Describe what a faculty needs to teach and a plan for delivery.	Describe what students should demonstrate and show upon the completion of a course.
At the end of the course, students will understand and know the concepts of the topics covered.	At the end of the course, students will be able to do, demonstrate, choose, design, ..... the topics covered.

**Relationship between PEOs, Pos, Cobs and COs:**



**B.Tech PROGRAMME STRUCTURE A.Y.2017-18**  
**Common for CSE, IT, ECE, EEE Branches**

I B.Tech			I Semester						
S.No	Sub-Code	Subject	L	T	P	Credits	Marks	Int.	Ext.
1	MA101BS	Mathematics – I	3	1	0	3	100	25	75
2	CH102BS	Engineering Chemistry	4	0	0	4	100	25	75
3	PH103BS	Engineering Physics – I	3	0	0	3	100	25	75
4	EN104HS	Professional Communication in English	3	0	0	3	100	25	75
5	ME105ES	Engineering Mechanics	3	0	0	3	100	25	75
6.	EE106ES	Basic Electrical and Electronics Engineering	4	0	0	4	100	25	75
7	EN107HS	English Language Communication Skills Lab	0	0	3	2	75	25	50
8	ME108ES	Engineering Workshop	0	0	3	2	75	25	50
9	*EA109MC	NSS	0	0	0	0	0	0	0
10		<b>*Life Skills Lab</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>(5)</b>	<b>(5)</b>	<b>0</b>
		<b>Total</b>	<b>20</b>	<b>1</b>	<b>9</b>	<b>24</b>	<b>750</b>	<b>200</b>	<b>550</b>

I B.Tech			II Semester						
S.No	Sub-Code	Subject	L	T	P	Credits	Marks	Int.	Ext.
1	PH201BS	Engineering Physics – II	3	0	0	3	100	25	75
2	MA202BS	Mathematics - II	4	1	0	4	100	25	75
3	MA203BS	Mathematics - III	4	1	0	4	100	25	75
4	CS204ES	Computer Programming in C	3	0	0	3	100	25	75
5	ME205ES	Engineering Graphics	2	0	4	4	100	25	75
6.	CH206BS	Engineering Chemistry Lab	0	0	3	2	75	25	50
7	PH207BS	Engineering Physics Lab	0	0	3	2	75	25	50
8	CS208ES	Computer Programming in C Lab	0	0	3	2	75	25	50
9	*EA209MC	NCC/NSO	0	0	0	0	0	0	0
10		<b>*Life Skills Lab</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>(5)</b>	<b>(5)</b>	<b>0</b>
		<b>Total</b>	<b>16</b>	<b>2</b>	<b>16</b>	<b>24</b>	<b>725</b>	<b>200</b>	<b>525</b>

**\*Mandatory Course/(5) Marks will be allotted for Life skills Based Assignment for each course.**

**B.Tech PROGRAMME STRUCTURE A.Y.2017-18  
MECHANICAL ENGINEERING**

**I B.Tech**

**I Semester**

S.N	Sub-Code	Subject	L	T	P	Credits	Marks	Int.	Ext.
1	MA101BS	Mathematics – I	3	1	0	3	100	25	75
2	MA102BS	Mathematics – II	4	1	0	4	100	25	75
3	PH103BS	Engineering Physics	3	0	0	3	100	25	75
4	CS104ES	Computer Programming in C	3	0	0	3	100	25	75
5	ME105ES	Engineering Mechanics	3	0	0	3	100	25	75
6	ME106ES	Engineering Graphics	2	0	4	4	100	25	75
7	PH107BS	Engineering Physics Lab	0	0	3	2	75	25	50
8	CS108ES	Computer Programming in C Lab	0	0	3	2	75	25	50
9	*EA109M C	NSS	0	0	0	0	0	0	0
10		*Life Skills Lab	0	0	3	0	(5)	(5)	0
		<b>Total</b>	<b>18</b>	<b>2</b>	<b>13</b>	<b>24</b>	<b>750</b>	<b>200</b>	<b>550</b>

**I B.Tech**

**II Semester**

S.N	Sub-Code	Subject	L	T	P	Credits	Marks	Int.	Ext.
1	AP201BS	Applied Physics	3	0	0	3	100	25	75
2	CH202BS	Engineering Chemistry	4	0	0	4	100	25	75
3	MA203BS	Mathematics – III	4	1	0	4	100	25	75
4	EN204HS	Professional Communication in English	3	0	0	3	100	25	75
5	EE205ES	Basic Electrical & Electronics Engineering	4	0	0	4	100	25	75
6	CH206BS	Engineering Chemistry Lab	0	0	3	2	75	25	50
7	EN207HS	English Language Communication Skills Lab	0	0	3	2	75	25	50
8	ME208ES	Engineering Workshop	0	0	3	2	75	25	50
9	*EA209M C	NCC/NSO	0	0	0	0	0	0	0
10		*Life Skills Lab	0	0	3	0	(5)	(5)	0
		<b>Total</b>	<b>18</b>	<b>1</b>	<b>12</b>	<b>24</b>	<b>725</b>	<b>200</b>	<b>525</b>

\*Mandatory Course/(5) Marks will be allotted for Life skills Based Assignment for each course.

**List of Modules Included in Life Skills Lab Curriculum**  
**First Year – Tentative 1<sup>st</sup> & 2<sup>nd</sup> Semester Course Modules (28)**  
**(Common to all branches)**

Semester I (14)		Semester II (14)	
Session	Skills Coverage	Session	Skills Coverage
1	Introduction to Basic Communication Skills	1	Goal Setting & Action-plan
2		2	
3		3	
4	Barriers of Communication Skills – Real-life case studies etc.,	4	Leadership Traits & skills - Introduction
5		5	
6		6	
7	Effective Speaking Skills– Practice Sessions	7	Problem solving & Decision-making skills
8		8	
9		9	
10	Active Listening Skills – Practice Sessions	10	Assertive Behaviour– Introduction & Role-plays
11		11	
12		12	
13	Vocabulary & Pronunciation - – Introduction & Practice Sessions	13	Yoga & Meditation – Demonstration, Practice & Techniques
14		14	
15		15	
16	Vocal Qualities of Speech – Introduction & Practice Sessions	16	Emotional Intelligence – 5 key factors
17		17	
18		18	
19	Effective Writing skills – Practice Sessions	19	Team Building – Activity Based
20		20	
21		21	
22	Yoga & Meditation – Demonstration, Practice & Techniques	22	Negotiating Skills – Business Game Based Learning
23		23	
24		24	
25	Basic Grammar – Practice Sessions	25	Stress & Anger Management
26		26	
27		27	
28	Personal Values, Developing Values, Cultivating Habits – Real-life cases, Activities etc.,	28	Time Management Exercises
29		29	
30		30	
31	Social Interaction Skills – Role-plays	31	Thinking Skills – Various Types of Thinking
32		32	
33		33	
34	Body Language-Introduction & Role-plays	34	Diversity & Social Responsibility
35		35	
36		36	
37	Presentation Skills– Practice Sessions	37	Data Interpretation
38		38	
39	Personal Grooming& Behavioural Etiquettes – Event Based Learning Activity	39	JAM & GD
40		40	

**Course Objectives and Outcomes**  
**(Common to CSE, IT, ECE, EEE Branches)**  
**SEMESTER-I**

<b>MATHEMATICS I– MA101BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. recognise the types of matrices and their properties</li> <li>2. equipped with the ability to solve the linear systems, Partial differentiation, concept of total derivative</li> <li>3. equipped with the ability to finding maxima and minima of functions of two variables</li> <li>4. equipped with the awareness of applications of the differential equations</li> </ol>	<p>The students will be able to:</p> <ol style="list-style-type: none"> <li>1. Analyse the matrix representation of a set of linear equations and to analyze the solution of the system of equations</li> <li>2. Acquire the Eigen values and Eigen vectors which come across under linear transformations</li> <li>3. Acquire the extreme values of functions of two variables with/ without constraints.</li> <li>4. Solve higher order de's and apply them for solving some real world problems</li> </ol>

<b>ENGINEERING CHEMISTRY –CH102BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. adapt to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.</li> <li>2. understand the importance of water in industrial usage and polymers and their controlled usage.</li> <li>3. acquire knowledge of engineering materials and about fuels and batteries.</li> <li>4. acquire required knowledge about engineering materials like cement, refractories and composites.</li> </ol>	<p>The students will be able to:</p> <ol style="list-style-type: none"> <li>1. apply basic knowledge of electrochemical procedures.</li> <li>2. develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.</li> <li>3. acquire the knowledge of the basic properties of water and its usage in domestic and industrial purposes.</li> <li>4. analyse predictions about the general properties of materials.</li> </ol>

<b>ENGINEERING PHYSICS I –PH103BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. analyse the interaction of light with matter through Interference, Diffraction and Polarization.</li> <li>2. distinguish ordinary light with a LASER light and to realize propagation of light through optical fibers.</li> <li>3. gain the concept of various crystal systems and their structures elaborately.</li> <li>4. analyse various crystal imperfections and probing methods like X-RD.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. analyse the importance of light phenomena in thin films and resolution.</li> <li>2. learn the principle, working of various laser systems and light propagation through optical fibers.</li> <li>3. review the various crystal systems and understand atomic packing factor.</li> <li>4. extract the various defects in crystals.</li> </ol>

<b>Professional Communication in English–EN104HS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.</li> <li>2. gains the ability to students to study subjects effectively using the theoretical and practical components of English syllabus.</li> <li>3. study and communication skills in formal and informal situations.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. articulate effectively in spoken and written forms.</li> <li>2. comprehend the given texts and respond appropriately.</li> <li>3. communicate confidently in formal and informal contexts.</li> </ol>

<b>ENGINEERING MECHANICS –ME105ES- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. understand the resolving forces and moments for a given force system</li> <li>2. analyze the types of friction for moving bodies and problems related to friction.</li> <li>3. determine the centroid and second moment of area</li> <li>4. analyze the concepts of kinematics of particle</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. acquire the vector analytical techniques for analyzing forces in statically determinate structures</li> <li>2. acquire the fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems</li> <li>3. extract the basic knowledge of Maths and Physics to solve real-world problem.</li> </ol>

<b>BASIC ELECTRICAL AND ELECTRONICS ENGINEERING –EE106ES - B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. acquire the concept of electrical circuits and its components</li> <li>2. get concepts of diodes and transistors, and their applications.</li> <li>3. acquire the knowledge of various configurations, characteristics and applications.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. analyze the semiconductor material characteristics.</li> <li>2. analyze and solve problems of electrical circuits using network laws and theorems.</li> <li>3. identify and characterize diodes and various types of transistors.</li> </ol>

<b>ENGLISH LANGUAGE COMMUNICATION SKILLS LAB –EN107HS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. understand the computer-assisted multi-media instruction and enable language learning</li> <li>2. bring a consistent accent and pronunciation of English by practice in speaking</li> <li>3. get fluency of in spoken English and neutralize their mother tongue influence</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. acquire the nuances of English language through audio- visual experience and group activities</li> <li>2. attain the neutralization of accent for intelligibility</li> <li>3. acquire the speaking skills with clarity and confidence</li> </ol>

<b>ENGINEERING WORKSHOP –ME108ES- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. know about different hand operated power tools, uses and their demonstration.</li> <li>2. develop a right attitude, team working, precision and safety at work place.</li> <li>3. understand the construction, function, use and application of different working tools, equipment and machines.</li> <li>4. know commonly used carpentry joints.</li> <li>5. get a practical exposure to various welding and joining processes.</li> <li>6. identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. study and practice on machine tools and their operations</li> <li>2. practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, and foundry, house wiring and welding.</li> <li>3. identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.</li> <li>4. apply basic electrical engineering knowledge for house wiring practice.</li> </ol>

<b>NSS –*EA109MC- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. get opportunities to play their due roles in the implementation of various development "programmes by planning and executing development projects, which not only help in creating durable community assets in rural areas and slums but also result in improvement of the condition of weaker sections of the communities.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. create awareness in social issues.</li> <li>2. participate in mass education program.</li> <li>3. develop some proposals for local slum area development and waste disposal.</li> <li>4. create environmental awareness.</li> <li>5. participate in relief and rehabilitation work during natural calamities.</li> </ol>

<b>LIFE SKILLS LAB - B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. acquire a performance based approach and is a unique combination of different kinds of knowledge, skills and attitudes.</li> <li>2. acquire the skills and attitudes of technical, Life Skills, Employability Skills, Ethics and Values.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. deal with the day to day challenges in a positive way.</li> <li>2. develop the way of seeing problems and letting to prepare to handle difficult situations.</li> <li>3. provide Effective Speaking Skills, Active Listening Skills, Basic Grammar and Self-confidence.</li> <li>4. do YOGA and MEDITATION to enable personal Grooming.</li> </ol>

## SEMESTER-II

<b>ENGINEERING PHYSICS II –PH201BS - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"><li>1. understand the behaviour of a particle quantum mechanically.</li><li>2. distinguish pure and impure semiconductors and understand formation of P-N Junction and devices</li><li>3. understand various magnetic properties of materials</li><li>4. understand various dielectric properties of materials.</li><li>5. know super-conductor behaviour of materials.</li></ol>	The student will be able to: <ol style="list-style-type: none"><li>1. acquire the importance of behaviour of a particle quantum mechanically.</li><li>2. analyse concentration estimation of charge carriers in semiconductors.</li><li>3. learn various magnetic properties and apply them in engineering applications.</li><li>4. analyse various dielectric properties and apply them in engineering applications.</li><li>5. extract the basic principles and applications of super conductors.</li></ol>

<b>MATHEMATICS II –MA202BS- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"><li>1. get the concepts and properties of Laplace Transforms</li><li>2. solve differential equations using Laplace transform techniques and Beta and Gamma Functions</li><li>3. evaluate multiple integrals and applying them to compute the volume and areas of regions</li><li>4. know the basic properties of vector valued functions and their applications to line, surface and volume integrals.</li></ol>	The student will be able to: <ol style="list-style-type: none"><li>1. use Laplace transform techniques for solving DE's</li><li>2. analyse integrals using Beta and Gamma functions</li><li>3. evaluate the multiple integrals and can apply these concepts to find areas, volumes, moment of inertia etc of regions on a plane or in space</li><li>4. evaluate the line, surface and volume integrals and converting them from one to another</li></ol>

<b>MATHEMATICS III –MA203BS - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"><li>1. know random variables and binomial geometric and normal distributions</li><li>2. understand distribution of mean, variance, point estimation and interval estimation</li><li>3. know the testing of hypothesis and ANOVA</li><li>4. understand least squares fitting for the given data and solve ordinary differential equations using numerical techniques</li></ol>	The student will be able to: <ol style="list-style-type: none"><li>1. differentiate among random variables involved in the probability models which are useful for all branches of engineering</li><li>2. calculate mean, proportions and variances of sampling distributions and to make important decisions for few samples which are taken from a large data</li><li>3. solve the tests of ANOVA for classified data</li><li>4. find the root of a given equation and solution of a system of equations and fit a curve for a given data</li></ol>



<b>COMPUTER PROGRAMMING IN C –CS204ES- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. learn the fundamentals of computers.</li> <li>2. understand the various steps in Program development.</li> <li>3. learn the syntax and semantics of C Programming Language.</li> <li>4. learn how to write modular and readable C Programs.</li> <li>5. learn to write programs using structured programming approach in C to solve problems.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. demonstrate the basic knowledge of computer hardware and software.</li> <li>2. write algorithms for solving problems.</li> <li>3. draw flowcharts for solving problems.</li> <li>4. code a given logic in C programming language.</li> <li>5. acquire the knowledge in using C language for solving problems.</li> </ol>

<b>ENGINEERING GRAPHICS –ME205ES - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. get basic concepts in engineering drawing.</li> <li>2. Acquire the knowledge about standard principles of orthographic projection of objects.</li> <li>3. draw sectional views and pictorial views of solids.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. prepare working drawings to communicate the ideas and information.</li> <li>2. read, understand and interpret engineering drawings.</li> </ol>

<b>ENGINEERING CHEMISTRY LAB –CH206BS - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. get a solid foundation in Chemistry laboratory required to solve engineering problems.</li> <li>2. understand practical implementation of fundamental concepts.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. estimate the impurities present in water.</li> <li>2. prepare advanced polymer materials.</li> <li>3. extract the strength of an acid present in secondary batteries.</li> <li>4. find the Fe<sup>+2</sup>, Ca &amp; Cl<sup>-</sup> present in unknown substances/ ores using titrimetric and instrumental methods.</li> </ol>

<b>ENGINEERING PHYSICS LAB –PH207BS- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. analyze various concepts of optics and optical instruments such as Spectrometer, Diffraction Grating and Prism</li> <li>2. analyze the behaviour and characteristics of various electronic circuits such as LCR, CR, and its components such as LED, Solar cell and PN Junction.</li> <li>3. understand the concept of rigidity modulus by torsional pendulum</li> <li>4. analyze the losses in optical fibre.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. learn the principles and applications of Interference, and Diffraction</li> <li>2. Analyze the characteristics of semiconductor devices</li> <li>3. acquire the importance of the rigidity modulus</li> <li>4. acquire the various parameters associated with optical fibre such as numerical aperture</li> </ol>

<b>COMPUTER PROGRAMMING IN C LAB –CS208ES- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. write programs in C using structured programming approach to solve the problems.	The student will be able to: 1. design and test programs to solve mathematical and scientific problems. 2. write structured programs using control structures and functions.

<b>NCC –*EA209MC- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. play their due roles in the implementation of various development "programmes by planning and executing development projects, which not only help in creating durable community assets in rural areas and slums but also result in improvement of the condition of weaker sections of the communities.	The student will be able to: 1. create awareness in social issues. 2. participate in mass education program. 3. develop some proposals for local slum area development and waste disposal. 4. create environmental awareness. 5. participate in relief and rehabilitation work during natural calamities.

<b>LIFE SKILLS LAB - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. understand a performance based approach and is a unique combination of different kinds of knowledge, skills and attitudes. 2. get skills and attitudes of technical, Life Skills, Employability Skills, Ethics and Values.	The student will be able to: 1. analyse the interpersonal skills, goal settings & action-Plan. 2. develop problem solving ability and decision making skills. 3. acquire the assertive behavior, Team building, Negotiative Skills and Stress Management.

## I B.Tech Course Objectives and Outcomes MECHANICAL ENGINEERING

### SEMESTER-I

<b>MATHEMATICS I– MA101BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. recognise the types of matrices and their properties</li> <li>2. equipped with the ability to solve the linear systems, Partial differentiation, concept of total derivative</li> <li>3. equipped with the ability to finding maxima and minima of functions of two variables</li> <li>4. equipped with the awareness of applications of the differential equations</li> </ol>	<p>The students will be able to:</p> <ol style="list-style-type: none"> <li>1. Analyse the matrix representation of a set of linear equations and to analyze the solution of the system of equations</li> <li>2. Acquire the Eigen values and Eigen vectors which come across under linear transformations</li> <li>3. Acquire the extreme values of functions of two variables with/ without constraints.</li> <li>4. Solve higher order de's and apply them for solving some real world problems</li> </ol>

<b>MATHEMATICS II –MA102BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. get the concepts and properties of Laplace Transforms</li> <li>2. solve differential equations using Laplace transform techniques and Beta and Gamma Functions</li> <li>3. evaluate multiple integrals and applying them to compute the volume and areas of regions</li> <li>4. know the basic properties of vector valued functions and their applications to line, surface and volume integrals.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. use Laplace transform techniques for solving DE's</li> <li>2. analyse integrals using Beta and Gamma functions</li> <li>3. evaluate the multiple integrals and can apply these concepts to find areas, volumes, moment of inertia etc of regions on a plane or in space</li> <li>4. evaluate the line, surface and volume integrals and converting them from one to another</li> </ol>

<b>ENGINEERING PHYSICS –PH103BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. analyse the interaction of light with matter through Interference, Diffraction and Polarization.</li> <li>2. distinguish ordinary light with a LASER light and to realize propagation of light through optical fibres.</li> <li>3. gain the concept of various crystal systems and their structures elaborately.</li> <li>4. analyse various crystal imperfections and probing methods like X-RD.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. analyse the importance of light phenomena in thin films and resolution.</li> <li>2. learn the principle, working of various laser systems and light propagation through optical fibres.</li> <li>3. review the various crystal systems and understand atomic packing factor.</li> <li>4. extract the various defects in crystals.</li> </ol>

<b>COMPUTER PROGRAMMING IN C –CS104ES- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. learn the fundamentals of computers.</li> <li>2. understand the various steps in Program development.</li> <li>3. learn the syntax and semantics of C Programming Language.</li> <li>4. learn how to write modular and readable C Programs.</li> <li>5. learn to write programs using structured programming approach in C to solve problems.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. demonstrate the basic knowledge of computer hardware and software.</li> <li>2. write algorithms for solving problems.</li> <li>3. draw flowcharts for solving problems.</li> <li>4. code a given logic in C programming language.</li> <li>5. acquire the knowledge in using C language for solving problems.</li> </ol>

<b>ENGINEERING MECHANICS –ME105ES- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. understand the resolving forces and moments for a given force system</li> <li>2. analyze the types of friction for moving bodies and problems related to friction.</li> <li>3. determine the centroid and second moment of area</li> <li>4. analyze the concepts of kinematics of particle</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. acquire the vector analytical techniques for analyzing forces in statically determinate structures</li> <li>2. acquire the fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems</li> <li>3. extract the basic knowledge of Maths and Physics to solve real-world problem.</li> </ol>

<b>ENGINEERING GRAPHICS –ME106ES - B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. get basic concepts in engineering drawing.</li> <li>2. Acquire the knowledge about standard principles of orthographic projection of objects.</li> <li>3. draw sectional views and pictorial views of solids.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. prepare working drawings to communicate the ideas and information.</li> <li>2. read, understand and interpret engineering drawings.</li> </ol>

<b>ENGINEERING PHYSICS LAB –PH107BS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. analyze various concepts of optics and optical instruments such as Spectrometer, Diffraction Grating and Prism</li> <li>2. analyze the behaviour and characteristics of various electronic circuits such as LCR, CR, and its components such as LED, Solar cell and PN Junction.</li> <li>3. understand the concept of rigidity modulus by torsional pendulum</li> <li>4. analyze the losses in optical fibre.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. learn the principles and applications of Interference, and Diffraction</li> <li>2. Analyze the characteristics of semiconductor devices</li> <li>3. acquire the importance of the rigidity modulus</li> <li>4. acquire the various parameters associated with optical fibre such as numerical aperture</li> </ol>

<b>COMPUTER PROGRAMMING IN C LAB –CS108ES- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. write programs in C using structured programming approach to solve the problems.	The student will be able to: 1. design and test programs to solve mathematical and scientific problems. 2. write structured programs using control structures and functions.

<b>NSS –*EA109MC- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. get opportunities to play their due roles in the implementation of various development "programmes by planning and executing development projects, which not only help in creating durable community assets in rural areas and slums but also result in improvement of the condition of weaker sections of the communities.	The student will be able to: 1. create awareness in social issues. 2. participate in mass education program. 3. develop some proposals for local slum area development and waste disposal. 4. create environmental awareness. 5. participate in relief and rehabilitation work during natural calamities.

<b>LIFE SKILLS LAB - B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. acquire a performance based approach and is a unique combination of different kinds of knowledge, skills and attitudes. 2. acquire the skills and attitudes of technical, Life Skills, Employability Skills, Ethics and Values.	The student will be able to: 1. deal with the day to day challenges in a positive way. 2. develop the way of seeing problems and letting to prepare to handle difficult situations. 3. provide Effective Speaking Skills, Active Listening Skills, Basic Grammar and Self-confidence. 4. do YOGA and MEDITATION to enable personal Grooming.

## **SEMESTER-II**

<b>APPLIED PHYSICS II –PH201BS - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: 1. understand the behaviour of a particle quantum mechanically. 2. distinguish pure and impure semiconductors and understand formation of P-N Junction and devices 3. understand various magnetic properties of materials 4. understand various dielectric properties of materials. 5. know super-conductor behaviour of materials.	The student will be able to: 1. acquire the importance of behaviour of a particle quantum mechanically. 2. analyse concentration estimation of charge carriers in semiconductors. 3. learn various magnetic properties and apply them in engineering applications. 4. analyse various dielectric properties and apply them in engineering applications. 5. extract the basic principles and applications of super conductors.

<b>ENGINEERING CHEMISTRY –CH202BS- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. adapt to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.</li> <li>2. understand the importance of water in industrial usage and polymers and their controlled usage.</li> <li>3. acquire knowledge of engineering materials and about fuels and batteries.</li> <li>4. acquire required knowledge about engineering materials like cement, refractories and composites.</li> </ol>	<p>The students will be able to:</p> <ol style="list-style-type: none"> <li>1. apply basic knowledge of electrochemical procedures.</li> <li>2. develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.</li> <li>3. acquire the knowledge of the basic properties of water and its usage in domestic and industrial purposes.</li> <li>4. analyse predictions about the general properties of materials.</li> </ol>

<b>MATHEMATICS III –MA203BS - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. know random variables and binomial geometric and normal distributions</li> <li>2. understand distribution of mean, variance, point estimation and interval estimation</li> <li>3. know the testing of hypothesis and ANOVA</li> <li>4. understand least squares fitting for the given data and solve ordinary differential equations using numerical techniques</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. differentiate among random variables involved in the probability models which are useful for all branches of engineering</li> <li>2. calculate mean, proportions and variances of sampling distributions and to make important decisions for few samples which are taken from a large data</li> <li>3. solve the tests of ANOVA for classified data</li> <li>4. find the root of a given equation and solution of a system of equations and fit a curve for a given data</li> </ol>

<b>Professional Communication in English–EN204HS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.</li> <li>2. gain the ability to students to study subjects effectively using the theoretical and practical components of English syllabus.</li> <li>3. study and communication skills in formal and informal situations.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. articulate effectively in spoken and written forms.</li> <li>2. comprehend the given texts and respond appropriately.</li> <li>3. communicate confidently in formal and informal contexts.</li> </ol>

<b>BASIC ELECTRICAL AND ELECTRONICS ENGINEERING –EE205ES - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"> <li>1. acquire the concept of electrical circuits and its components</li> <li>2. get concepts of diodes and transistors, and their applications.</li> <li>3. acquire the knowledge of various configurations, characteristics and applications.</li> </ol>	The student will be able to: <ol style="list-style-type: none"> <li>1. analyze the semiconductor material characteristics.</li> <li>2. analyze and solve problems of electrical circuits using network laws and theorems.</li> <li>3. identify and characterize diodes and various types of transistors.</li> </ol>

<b>ENGINEERING CHEMISTRY LAB –CH206BS - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"> <li>1. get a solid foundation in Chemistry laboratory required to solve engineering problems.</li> <li>2. understand practical implementation of fundamental concepts.</li> </ol>	The student will be able to: <ol style="list-style-type: none"> <li>1. estimate the impurities present in water.</li> <li>2. prepare advanced polymer materials.</li> <li>3. extract the strength of an acid present in secondary batteries.</li> <li>4. find the Fe<sup>+2</sup>, Ca &amp; Cl<sup>-</sup> present in unknown substances/ ores using titrimetric and instrumental methods.</li> </ol>

<b>ENGLISH LANGUAGE COMMUNICATION SKILLS LAB –EN207HS- B.Tech- I Year- I Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"> <li>1. understand the computer-assisted multi-media instruction and enable language learning</li> <li>2. bring a consistent accent and pronunciation of English by practice in speaking</li> <li>3. get fluency of in spoken English and neutralize their mother tongue influence</li> </ol>	The student will be able to: <ol style="list-style-type: none"> <li>1. acquire the nuances of English language through audio- visual experience and group activities</li> <li>2. attain the neutralization of accent for intelligibility</li> <li>3. acquire the speaking skills with clarity and confidence</li> </ol>

<b>ENGINEERING WORKSHOP –ME208ES- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
The students will: <ol style="list-style-type: none"> <li>1. know about different hand operated power tools, uses and their demonstration.</li> <li>2. develop a right attitude, team working, precision and safety at work place.</li> <li>3. understand the construction, function, use and application of different working tools, equipment and machines.</li> <li>4. know commonly used carpentry joints.</li> <li>5. get a practical exposure to various welding and joining processes.</li> <li>6. identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.</li> </ol>	The student will be able to: <ol style="list-style-type: none"> <li>1. study and practice on machine tools and their operations</li> <li>2. practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, and foundry, house wiring and welding.</li> <li>3. identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiselling.</li> <li>4. apply basic electrical engineering knowledge for house wiring practice.</li> </ol>

<b>NCC –*EA209MC- B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. play their due roles in the implementation of various development "programmes by planning and executing development projects, which not only help in creating durable community assets in rural areas and slums but also result in improvement of the condition of weaker sections of the communities.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. create awareness in social issues.</li> <li>2. participate in mass education program.</li> <li>3. develop some proposals for local slum area development and waste disposal.</li> <li>4. create environmental awareness.</li> <li>5. participate in relief and rehabilitation work during natural calamities.</li> </ol>

<b>LIFE SKILLS LAB - B.Tech- I Year- II Semester</b>	
<b>Course Objectives</b>	<b>Course Outcomes</b>
<p>The students will:</p> <ol style="list-style-type: none"> <li>1. understand a performance based approach and is a unique combination of different kinds of knowledge, skills and attitudes.</li> <li>2. get skills and attitudes of technical, Life Skills, Employability Skills, Ethics and Values.</li> </ol>	<p>The student will be able to:</p> <ol style="list-style-type: none"> <li>1. analyse the interpersonal skills, goal settings &amp; action-Plan.</li> <li>2. develop problem solving ability and decision making skills.</li> <li>3. acquire the assertive behaviour, Team building, Negotiative Skills and Stress Management.</li> </ol>

### Second Year – Tentative 1<sup>st</sup> & 2<sup>nd</sup> Semester Course Modules (41)

<b>Semester I (21)</b>		<b>Semester II (20)</b>	
<b>Session</b>	<b>Skills Coverage</b>	<b>Session</b>	<b>Skills Coverage</b>
1	Introduction to (Neuro Linguistic Programming) NLP Communication Skills	1	Dealing with Criticism
2		2	
3	Barriers of Communication& Role-plays	3	Wheel of Life – Self-assessment & Activities
4		4	
5	Effective Speaking Skills– Practice Sessions& Role-plays	5	Self-concept & Self-reliance
6		6	
7	Active Listening Skills– Practice Sessions& Role-plays	7	Time Management & Prioritization Skills
8		8	
9	Vocabulary & Pronunciation– Practice Sessions	9	Leadership skills – Activities, Case-studies, Assessments
10		10	
11	Vocal Qualities of Speech– Practice Sessions & Role-plays	11	Team building skills - Activities
12		12	
13	Effective Writing skills– Practice Sessions	13	Problem solving skills - Activities
14		14	
15	Everyday grammar& Speaking– Practice Sessions	15	Public speaking Skills – Activities, Impromptu, Assignments
16		16	
17	Power of Questioning Skills– Practice Sessions & Role-plays	17	Thinking Out-of-the Box – Case-study & Activity Based
18		18	
19	Body language (Facial Expressions, Gestures etc.,) – Practice Sessions & Role-plays	19	Know The Industry – Home Assignments, Research Based Activity – Role-plays
20		20	
21	Yoga & Meditation – Demonstration, Practice & Techniques	21	Developing a Vision& Action-plan
22		22	



23	Attitude & Behaviour– Practice Sessions& Role-plays	23	Positive Attitude & Power of Positive Energy
24		24	
25	Empathy– Practice Sessions & Role-plays	25	Yoga & Meditation – Demonstration, Practice & Techniques
26		26	
27	Personal Grooming& Behavioural Etiquettes– Event Based Learning Activity	27	Anger & Stress Management
28	Interpersonal skills – Role-plays & Activities	28	
29		29	Corporate Etiquettes
30	Negotiation Skills - – Business Game Based Learning	30	Conflict Resolution & Management
31		31	
32	Problem solving & Decision-Making skills -- Business Game Based Learning	32	Data Sufficiency
33		33	
34	Emotional Intelligence – 5 key factors	34	Thinking Skills – Various Types of Thinking
35		35	
36	Assertive Behaviour– Practice Sessions & Role-plays	36	Emotional Intelligence – Theatricals, Skit/Drama
37		37	
38	Design Thinking, Digitization & Data – Latest Trends in Human Resource	38	JAM & GD
39		39	
40	SWOT Analysis - Individual	40	

### Third Year – Tentative 1<sup>st</sup> & 2<sup>nd</sup> Semester Course Modules (54)

Semester I (26)		Semester II (28)	
Session	Skills Coverage	Session	Skills Coverage
1	Advanced Communication Skills	1	Leadership Lessons – Project Based Learning
2		2	
3	Business Speaking Skills -- Practice Sessions	3	Yoga & Meditation – Demonstration, Practice & Techniques
4		4	
5	Organizational Behaviour - Essentials	5	Introduction & Basics of Crisis Resolution
6		6	
7	Speaking & Listening for Success -- Practice Sessions	7	Sentence construction
8		8	Prepositions
9	Business & Corporate Vocabulary - Practice Sessions	9	Articles
10		10	Auxiliary
11	English Language – Debate & GD	11	Tenses
12		12	S+V= Agreement
13	Questioning Skills – Role-play & Practice Sessions	13	Common Errors
14	Effective Writing skills- Practice Sessions	14	MTI
15		15	Modals
16	Yoga & Meditation – Demonstration, Practice & Techniques	16	Common Errors
17		17	Logical Deductions(Syllogism)
18	Body language -- Role-play & Practice Sessions	18	Analytical reasoning
19	Facial Expressions & Gestures	19	
20	Interpersonal Skills-- Role-play & Practice	20	Problems on Ages

21	Sessions	21	
22	Assertive Behaviour-- Role-play & Practice Sessions	22	Quantitative Aptitude
23	Personal Grooming& Behavioural Etiquettes	23	
24	Emotional Intelligence – 5 key factors	24	Logical Reasoning
25		25	
26	Industry Knowledge Projects – Various Industry Information, Discussion etc.,	26	Permutation & Combination and Probability
27	Developing Rapport & Cordial Relations -- Role-play & Practice Sessions	27	
28	Negotiation& Persuasion Skills	28	Industry Expectations & SWOT
29	Problem solving & Decision-making skills	29	
30	Career Planning & Goals - Assessments	30	Job search Techniques
31	Risk -Analysis, Planning & Action - Role-play & Practice Sessions	31	
32	Change Planning & Management- For Self	32	Writing a Resume for various posts in various industry's
33		33	
34	Customer Service in 21 <sup>st</sup> Century	34	Planning, Preparing & Giving an Interview
35		35	
36	Time management & Prioritization	36	Lessons to Learn from Interviews & Improvements
37		37	
38	Public Speaking Skills	38	Interview Questions, Techniques & Mock Interviews
39		39	
40	JAM & GD	40	JAM & GD

#### Fourth Year – Tentative 1<sup>st</sup> & 2<sup>nd</sup> Semester Course Modules (80)

Semester I (40)		Semester II (40)	
Session	Skills Coverage	Session	Skills Coverage
1	Advanced Communication Skills	1	Industry Expectations & SWOT
2	Business Speaking Skills -- Practice Sessions	2	Job Search Techniques & Tips
3	Speaking & Listening for Success -- Practice Sessions	3	Writing a Resume for various posts in various industry's
4	Organizational Behaviour - Essentials	4	Planning, Preparing & Giving an Interview and Follow-up Tips
5	Business & Corporate Vocabulary - Practice Sessions	5	Lessons to Learn from Interviews & Improvements
6	English Language – Debate & GD	6	Interview Questions, Techniques & Mock Interviews
7	Yoga & Meditation – Demonstration, Practice & Techniques	7	Yoga & Meditation – Demonstration, Practice & Techniques
8	Interpersonal skills in Employment	8	Email Etiquettes
9	Reading Body Language, Observing Cues etc- Instructions, Demo & Role-plays	9	Organizational culture & Values
10	Emotional Intelligence – Art of Managing Others Emotions	10	Ratio & Proportions
11	Negotiation & Art of Persuasion	11	Percentages + Profit & Loss
12	Problem Solving/Decision Making Skills	12	Simplification + Average
13	Traits of Engaged Employee	13	Partnership + Simple & Compound Interest

14	Business & Corporate Acumen	14	Percentages + Profit & Loss
15	Employee Mindset& Engagement	15	Time & Work
16	Delegation of Work	16	Time & Distance
17	SWOT Analysis of Self & Company	17	Permutation & Combination and Probability
18	Professional Behaviour	18	Problems on Ages
19	Time management & Prioritization	19	Calendars
20	Public Speaking Skills	20	Clock
21	Presentation Skills	21	Solid geometry – 2D & 3D
22	Positive Attitude & Thinking	22	Volumes & Surface Areas
23	Anger & Stress Management	23	Logical Deductions(Sylogism)
24	Team Building & Management	24	Data Interpretation
25	Leadership Skills – People Relations	25	Data Sufficiency
26	Learning from Failures	26	<b>Unitary Method</b>
27	Body Language	27	Partnership
28	Sentence construction	28	Problems on Ages
29	Prepositions	29	Direction Sense Test
30	Articles	30	Blood Relations
31	Auxiliary	31	Cubes
32	Tenses	32	Volumes & Surface Areas
33	S+V=Agreement	33	Arrangement Problems
34	Common Errors	34	Coding and Decoding
35	MTI	35	Series and Sequences
36	Modals	36	Analytical Puzzles
37	Common Errors	37	JAM
38	JAM	38	GD
39	GD	39	PI
40	Mock Interview	40	Tips to succeed in Campus Recruitment