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**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**

**CIRCULAR NO. ACAD / NP / B.Tech / 23 / 2011**

It is hereby notified for the information of all concerned that, the Academic Council at its meeting held on 29-08-2011 has accepted the "Syllabus of F.Y. B.Tech. [Chemical] for University Department of Chemical Tecnology and F.Y.B.Tech. (All Branches) run at M.I.T. Aurangabad under the Faculty of Engineering and Technology *as appended herewith.*

This will be effective from the Academic Year 2011-2012 and onwards.


All concerned are requested to note the contents of this Circular for their information and necessary action.

University Campus,  
Aurangabad-431 004.  
REF.NO.ACAD/NP/B.TECH/2011/  
19623-30

Date:- 02-09-2011.

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DIRECTOR,  
*Board of College and  
University Development.*

**Copy forwarded with compliments to:-**

- 1] The Principals, affiliated concerned Colleges,  
Dr. Babasaheb Ambedkar Marathwada University.

**Copy to :-**

- 1] The Controller of Examinations,
- 2] The Assistant Superintendent, [Engineering Unit],
- 3] The Record Keeper,  
Dr. Babasaheb Ambedkar Marathwada University.

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**RULES AND REGULATIONS**  
**FOR**  
**B. TECH. PROGRAMME**  
(Effective from Academic year 2011-2012)



**Dr. Babasaheb Ambedkar Marathwada University,**  
**Aurangabad**

## **RULES, REGULATIONS AND ORDINANCES**

### **B. TECH. PROGRAMME**

**(Effective from Academic year 2011-2012)**

#### **Short title and Commencement**

1. i) These ordinances shall be called the Ordinances for Bachelor of Technology Programme run by the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.
- ii) These ordinances shall come into force with effect from such date as approved by the authorities of Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

#### **Definitions**

2. Unless the context requires otherwise,
  - 5.1 "Applicant" shall mean an individual who applies for admission to any B. Tech. Programme.
  - 5.2 "CGPA" shall mean the Cumulative Grade Point Average of a student.
  - 5.3 "Coordination Committee" shall mean the committee of the faculty members involved in a course.
  - 5.4 "Course" shall mean a curricular component of a programme identified by a designated code number and a title.
  - 5.5 "Course Coordinator" shall mean a faculty member who shall have full responsibility for the course, coordinating the work of other faculty member(s) involved in that course, including examinations and the award of grades.
  - 5.6 "Degree" shall mean the Bachelor's degree viz. B. Tech. and such other degrees of the university as may be approved by the authorities concerned.
  - 5.7 "DSB" means Departmental Subject Board.
  - 5.8 "Direct Admitted Student" shall mean a student who is admitted directly to second year of the degree program after completion of the Diploma Course and registered for undergraduate programme for full time study leading to B. Tech. degree.
  - 5.9 "Programme" means offering of the University for the Award of degree in a specific branch of study.
  - 5.10 "Student" shall mean a student registered for undergraduate programme for full time study leading to Bachelor's degree.
  - 5.11 "Scheme of Teaching and Examination" shall mean the scheme of teaching and examination for a programme of study as approved by the university authorities.
  - 5.12 "SGPA" shall mean the semester grade point average.
  - 5.13 "UG" shall mean undergraduate.
  - 5.14 "UGPIC" shall mean Undergraduate Programme Implementation Committee. This will consist of the University head of the department/Principal of the college, All Deans, Registrar (Academic), Examinations Controller and Chairman of DSBs within the department/college.

3.

1. The University shall offer such UG programmes of such minimum duration as the All India Council for Technical Education may approve and Government of Maharashtra may permit.
2. The minimum entry qualification and procedure for admission to UG programmes shall be as per the directives of the Govt. of Maharashtra.
3. UG student shall be required to earn minimum number of credits through various academic courses of a curriculum as provided for in the regulation.
4. A UG student shall be required to complete all the requirements for the award of the Bachelor's degree within such period as may be specified in the Regulations, including those credits earned at such other institutions/courses as have been recognized by the University for this purpose.
5. The date of initial registration for the UG programme shall normally be the date on which the student formally registers for the first time. This date shall be treated as the date of joining the programmes for all intents and purposes.
6. A student shall be required normally to attend every lecture, tutorial and practical class. However, for late registration, sickness or other such exigencies, absence may be allowed as provided for in the regulations.
7. The procedure for the direct second year admission shall be as per the directives of the Govt. of Maharashtra.
8. The procedure for the withdrawal from an undergraduate programme, rejoining the programme, the award of grades and the SGPA/ CGPA, the examination and all such matters as may be connected with the running of a UG programme shall be as specified in the regulations.
9. The award of the UG degree to an eligible candidate shall be made in accordance with the procedure laid down in the regulations.
10. A student admitted to the UG programme shall abide by the "Standing Orders for Students" issued by the Institute from time to time. These standing orders shall deal with the discipline of the students in the Hostels, Departments, the Institute premises and outside. The standing orders may also deal with such other matters as are considered necessary for the general conduct of the students, co-curricular and extra-curricular activities. The University head of the department/Principal of the college shall approve these standing orders.
11. Notwithstanding anything contained in the above ordinances, no regulations shall be made in contravention of the directives of the Government of Maharashtra, in regard to the duration of the UG programme.

### **Regulations for the Undergraduate Programme (B. Tech.)**

**1. General:**

- 1.1 These regulations shall be called the regulations for the Bachelor of Technology programmes of the university.
- 1.2 These regulations shall come into force from the academic year 2011-2012.

**2. Undergraduate Programme**

- 2.1 The Undergraduate Programme offered shall lead to Bachelor's degree in Technology B. Tech. (Specialization)
- 2.2 The duration of UG programme leading to degree of B. Tech. is normally of four years (Eight semesters).

However, the maximum duration to complete the UG programme is eight years from the date of initial registration. The maximum duration of the programme includes the period of absence and different kinds of leaves permissible to a student but it shall exclude the period of rustication/detention of the student from the department.

### 3. Semester System

- 3.1 The academic programmes in the university department shall be based on Semester system: two semesters (July-Nov) and (Jan-April) in a year with minimum 90 working days in each semester.
- 3.2 Each course shall have a certain number of credits assigned to it depending upon the academic load of the course, which would be assessed on the basis of weekly contact hours of theory lectures and laboratory classes, field study. The credits for the Project shall be assigned depending upon the quantum of work expected.
- 3.3 The courses offered in a semester shall be continually assessed and evaluated to judge the performance of a student.

### 4. Course Codes

- 4.1 The course offered by the university department shall have an alphanumeric course code consisting of a string of six characters. The first three characters in a course code shall be capital letters identifying the responsible department offering the course. The next three numerical digits give the following information. The first digit specifies the year of study of the UG course. Second and third digit specifies the serial number of the subject.

### 5. Course Credits

- 5.1 Each course shall have an integer number of credits, which reflects its weightage. The number of credits of course in a semester shall ordinarily be calculated as under:-
  - (a) *Lectures*: One lecture hour per week shall be assigned one credit.
  - (b) *Practicals*: One laboratory hour per week shall be assigned half a credit. Not more than three credits may be assigned to a practical course having only laboratory component. The courses having three hours of contact every alternate week shall have one credit only.
  - (c) Special courses like project, practical training, National Cadet Corps (NCC)/National Service Scheme (NSS)/National Sports Organization (NSO) in the UG programme shall be treated as any other course and shall be assigned such number of credits as may be approved by the authorities.

#### 5.2 Courses of Special Nature

- (a) **Professional Electives**: A curriculum may contain a 10 credit course on specialized technologies as a departmental elective, which may be offered in six and seventh semesters to have a profound knowledge of the concerned subject. An elective course in a department shall run only if 25% of the sanctioned intake registers for it in a regular semester. The students have to opt any one of the electives of his/her interest from the list provided in the concerned semester.

- (b) **Major Project:** A curriculum shall contain a 13 credit component of major project and seminar, generally offered in the fourth year of the UG programmes specified in the scheme.
- (c) **In plant Training:** A curriculum shall contain inplant training (Off campus) in reputed industries/institute for the period specified in the scheme. generally offered in the eighth semester of fourth year of the UG programme.

#### 6. Departmental Subject Board (DSB)

Every academic department will have Departmental Subject Board (DSB) consisting of

- a) Head of the University Department/Head of Department of College
- b) Two Senior Teachers by rotation
- c) Three Subject Experts nominated by the Principal of the college/University head of the department
- d) Two professional experts from the Industry or any other field as the case may be.
- e) Maximum Two students nominated by the University head of the department/Principal of the college on the basis of their merit in the preceding examination
- f) Dean (Academics)

The DSB shall be responsible for considering all the policy issues concerning academic and research programmes of the Department. There shall be at least two meetings of DSB in a semester.

#### 7. Registration

- 7.1 Registration at the beginning of each semester/year on the prescribed dates announced from time to time by payment of the stipulated fees is compulsory for every student till he/she completes the Programme.
- 7.2 Registration, according to rules, should be carried out on the declared days of each semester/year. Late registration may be permitted on payment of a late registration fee. In any case, registration must be completed before the prescribed last date for registration. Students having outstanding dues to the Institute or hostel shall be permitted to register only after clearing the dues.
- 7.3 Such students who have passed all the courses prescribed for the both semesters in the year and having no backlog courses will be eligible to register for the next year.
- 7.4 Such students who have earned at least 34 credits out of 54 credits in the year will be allowed to register for next year. However these students will have to earn the credit for backlog courses on self-study basis. They can appear for improvement in supplementary examination from next semester onwards.
- 7.5 Such students who have failed to earn 34 credits out of 54 credits in the academic year will not be allowed to register for next higher class. They will have to appear for improvement in their results in the subject/s failed from subsequent examination. They will be eligible to register for higher class when credits earned by them are 34 or more.
- 7.6 For the registration of the third year, the student should have passed all the courses of the first year. Student must have earned 54 credits of First Year and earned minimum 34 credits out of 54 credits in second year.
- 7.7 For the registration of the final year, the student should have passed all the courses of the second year. Student must have earned 54 credits of Second Year and minimum 34 credits out of 54 credits in third year.

7.8 Every student shall register for the courses that he/she wants to study for earning credits and his /her name will appear in the roll list of each such course. No credit shall be given if a student attends a course for which he or she has not registered.

#### **8. Change of Branch (Specialization)**

8.1 A student enrolled for B. Tech. degree shall be eligible for change of specialization at the end of first year provided he/she satisfies the following criteria:

- (i) CGPA of the students is more than 5.
- (ii) Must have earned all the credits of the first year in first two semesters only. The change of specialization will be done within one week from the date of registration of second year.

8.2 In making a change of specialization the strength of a class should not fall below 70% of sanctioned intake and should not exceed the sanctioned intake.

8.3 The change of specialization shall be operated strictly on the basis of inter-se merit as reflected in their CGPA. In the same, their inter-se merit shall be decided on the basis of % marks obtained at common entrance test (CET) and HSC marks in that order.

#### **9. Termination of Enrolment due to Absence or on Academic Grounds**

9.1 If a student is continuously absent from the classes for more than four weeks without informing the course Coordinator shall immediately bring it to the notice of First Year Class Coordinator/ the Head of the concerned department as the case may be and to the University head of the department/ Principal of the college. Such student will be detained and shall be allowed to register next year.

9.2 If a student fails to earn 34 credits out of 54 credits of a year within two consecutive years (i.e. even after availability of four opportunities to appear for examination of each course code), his/her admission will be cancelled. If a student fails to earn 54 credits out of 54 credits of a year within three consecutive years (i.e. even after availability of six opportunities to appear for examination of each course code), his/her admission will be cancelled.

9.3 The enrolment of a student may be terminated on disciplinary grounds, in accordance with the Standing Orders for the students.

#### **10. Attendance, Absence, Leave Rules and Dismissals**

10.1 An undergraduate student must have a minimum attendance of 90% of the total number of classes including lectures, tutorials and practicals, held in a course (subject) before the corresponding examination i.e. End Semester Examination, in order to be eligible to appear for the respective examination in the course, failing which the student will be detained in the said course and has to re-register for that course in the following semester/year.

- a) In special cases and for sufficient causes shown, the University Head of Department/Principal of the college may, on the specific recommendation the Course coordinator/Head of the Department, condone the deficiency in attendance to the extent of 15 % on medical ground subject to submission of medical

certificate.

- b) However, in respect of women candidates who seek condonation of attendance due to pregnancy, the University Head of Department/Principal of the college may condone the deficiency in attendance to the extent of 25 % (as against 15 % Condonation for other) on medical grounds subject to submission of medical certificate to this effect. Such condonation shall not be availed twice during the course of study.
- 10.2 If student is found guilty of malpractice in examinations, involvement in ragging and overall misconduct during his/her stay in the department, he/she will be punished as per the rules of the University/the Government of Maharashtra.
- 10.3 If a student fails or is absent in the End Semester Examination (ESE) of a course, he/she may appear for supplementary examination. Such supplementary examination shall be held along with next semester examination.

#### 11. Examination Scheme

- 11.1 A student shall be evaluated for his/her academic performance in a course through tutorials, practicals, homework assignments, term papers, field work, seminars, quizzes, Test Examinations, and the End-Semester Examination as applicable according to the guidelines formulated for this purpose.
- 11.2 There would be two class test, out of which at least one should be online test examination during the semester of 20 marks (1-Hour duration) in every theory course. The class test performance shall be considered as an average of two class tests.
- 11.3 At the end of the semester, there would be an End Semester Examination as per syllabus. For the examination of First Year for the academic year 2011-2012, the minimum percentage for passing for each course code, practical examination and ESE is 40 %, failing which he/she will get D grade for that course code. This rule will be progressively applicable for higher classes in next consecutive years. Practical/viva voce examination student must secure minimum 35% marks, failing which he/she will get grade D for that course code.
- 11.4 The project work shall be evaluated by midterm seminar(s), quality of work carried out, project report submission and the viva-voce examinations.
- 11.5 The industrial/field training shall be evaluated through the quality of work carried out, the report submission and presentation(s).
- 11.6 Rule for combined passing:
- 1) To pass the examination a candidate must obtain minimum 40% of Marks in each End Semester Examination & class test taken together, however the candidate must obtain minimum 35% of Marks at the End Semester Examination.
  - 2) To pass a subject where there is no provision of class test, the candidate must obtain 40% of Marks in the End Semester Examination.
  - 3) Gracing should be done for the performance at End Semester Examination or End Semester Examination and class test taken together.
  - 4) Minimum two-class tests should be conducted in semester for a subject, if provided. The average performance out of the Two-class test should be forwarded to the Examinations Controller.

5) If the candidate remains absent for the class-test, his performance should be treated as 'Zero' Marks.

**0.95 GRACE MARKS FOR PASSING IN EACH HEAD OF PASSING (THEORY / PRACTICAL / ORAL / SESSIONAL) (EXTERNAL / INTERNAL)**

The examinee shall be given the benefit of grace marks only for passing in each head of passing (Theory/practical/Oral/ Sectional) in external or Internal examination as follows:-

Head of passing	Grace Marks upto
Up to 50	2
051 to 100	3
101 to 150	4
151 to 200	5
201 to 250	6
251 to 300	7
301 to 350	8
351 to 400	9
And 401 and above	10

Provided that the benefit of such gracing marks given in different heads of passing shall not exceed 01 % of the aggregate marks in that examination.

Provided, further that the benefit of gracing of marks under this ordinance shall be applicable only if the candidate passes the entire examination of year.

Provided further that this gracing is concurrent with the rules and guidelines of professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, CCIH, NCTE, UGC etc.

**0.98 CONDONATION**

If a candidate fails in only one head of passing, having passed in all other heads of passing, his/her deficiency of marks in such head of passing may be condoned by not more than 01 % of the aggregate marks of the examination or 10 % of the total number of marks of the head of passing in which he/she is failing, whichever is less. However, condonation, whether in one head of passing or aggregate head of passing be restricted to maximum up to 10 marks only.

Condonation of deficiency of marks be shown in the statement of marks in the form of asterisk and ordinance number.

If a student desires not to opt for the condonation He/she may be permitted to reappear the examination of the subject, provided he/she submits the request to the examination controller within four days of declaration of the result.

Provided that this condonation of marks in concurrent with the rules and guidelines of professional statutory bodies at the All India level such as AICTE, MCI, Bar Council, CCIM, CCIH,NCTE etc

## **12. The Grading System**

For every course taken by a student, he/she is assigned a grade based on his/her combined performance in all the assessments including laboratory or any other assignment. The grade indicates a qualitative assessment of the student's performance and is associated with equivalent number called a grade point.

The academic performance shall be graded on a ten-point scale following guidelines given in Appendix-A. The letter grades and their equivalent grade points are listed in the Appendix-A.

The letter Grades (up to D only) awarded to a student in all the courses shall be converted into a semester and cumulative performance index called the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA), to be calculated by following the procedures given in Appendix-B.

## **13. Scrutiny of Grades**

A student may apply for scrutiny of grades to the Controller of examinations (COE), by paying the specified fees, within three days from the date of scheduled display of grades. A committee appointed by the Controller of Examinations may check the entry of the weightage from different components of evaluation and their addition, the addition of marks in the final answer scripts and unchecked questions, if any. The results of scrutiny may lead to either a change in grade due to error(s) in any of the aspects scrutinized by the committee or the grade may remain unchanged, COE will display the results.

## **14. CGPA for direct second year admitted students:**

In case of the students directly admitted to second year through direct second year admission process, the CGPA shall be calculated on basis of his/her performance in three years (Six Semester) i.e. second year, third year and final year.

## **15. Conversion of Percentage system students into CGPA:**

In case of students who have completed earlier classes in percentage system and shall be taking admission in CGPA system from second year onwards for them the marks obtained in previous examination/s conducted in percentage system will be converted into SGPA for respective years on completion of all courses of that year ( $\% \text{ score minus } 7.5 \text{ divided by } 10$ ). This converted SGPA shall be used for calculating CGPA of the student.

## **16. Minimum Students Requirement for an Elective Course**

An elective course in a department shall run only if 25% of the sanctioned intake registers for it in a regular semester. However, under special circumstances, a course may run with fewer students with prior permission of the university head of the department/Principal of the college.

## **17. Minimum Requirements for the Award of the Degree**

**17.1** The student should have taken and passed all the prescribed courses under the general institutional and departmental requirements and the student should have paid all the dues.

- 17.2 The student should have satisfactorily fulfilled other academic requirements like practical training, visits, seminar and the project and the student should have no case of indiscipline pending against him/her.
- 17.3 The credits for the courses in which a student has obtained "C" (minimum passing grade for a course) grade or higher shall be counted as credits earned by him/her.

**18. Maximum Period for Completion of Programme**

In any case, a student should fulfill the requirements for his/her respective degree within the maximum period specified for each degree as given below.

B. Tech. Programme (4 years): eight years

B. Tech. Programme (for direct admitted students to second year): Seven years

**19. Interpretation of Regulations**

In case of any dispute, difference of opinion in interpretation of these regulations or any other matter not covered in these regulations, the decision of the Vice-Chancellor shall be final and binding.

**20. Discretionary Powers**

Notwithstanding anything contained in the above regulations or in any extraordinary situations as the Programme Head and/or Dean Academic think necessary, University head of the department/Principal of the college may take action on behalf of the university as he feels appropriate and report it to the Vice-Chancellor of the university.

**APPENDIX - A**

**STRUCTURE OF GRADING OF ACADEMIC PERFORMANCE**

Grade	CGPA	Range of Marks	Description of Performance
A++	10	86-100	Outstanding
A+	9	76-85	Excellent
A	8	66-75	Very Good
B+	7	61-65	Good
B	6	56-60	Fair
C+	5	51-55	Average
C	4	40-50	Below Average
D	0	Below 40	Failed

[For securing minimum grade of passing for a course code, student must get minimum 40 % marks in that course code. Additionally for securing minimum grade of passing for a course code having theory paper of ESE, student must get minimum 35 % marks (in case of fraction rounding of marks will be on higher side) in theory paper of ESE of that course code.]

## APPENDIX –B

### Performance Indices

- (i) **Calculation of Semester Grade Point Average (SGPA)** The performance of a student in a semester is indicated by a number called SGPA. The SGPA is the weighted average of the grade points obtained in all the courses registered by the student during the semester.

$$\text{SGPA} = \frac{\sum_{i=1}^n C_i p_i}{\sum_{i=1}^n C_i}$$

Where,

$C_i$  = The number of credits assigned in the  $i^{\text{th}}$  course of a semester for which SGPA is to be calculated

$P_i$  = Grade point earned in the  $i^{\text{th}}$  course

$i = 1, 2, \dots, n$  represent the number of courses in which a student is registered in the concerned semester

The SGPA is calculated to two decimal places.

- (ii) **Calculation of Cumulative Grade Point Average (CGPA)**

An up to date assessment of the overall performance of a student from the time of his first registration is obtained by calculating a number called CGPA, which is weighted average of the grade points obtained in all the courses registered by the student since he/she entered the Institute.

$$\text{CGPA} = \frac{\sum_{j=1}^m C_j P_j}{\sum_{j=1}^m C_j}$$

Where,

$C_j$  = The number of credits earned in the  $j^{\text{th}}$  course up to the semester for which CGPA is to be calculated

$P_j$  = Grade point earned in the  $j^{\text{th}}$  course.

$j = 1, 2, \dots, m$  represent the number of courses in which a student is registered up to the semester for which the CGPA is to be calculated

The CGPA is also calculated to two decimal places.

**Guidelines for the Award of Grades**

The following are the general guidelines for the award of grades:

- i) For each student, all evaluations in different components of a course shall be done in absolute marks considering the weightage in the scheme.
- ii) The marks of various components shall be added to get total marks secured.
- iii) The grades so awarded shall be moderated by a Grade Moderation committee formed by COE. This committee will finalize the grades and display a copy of the grades awarded on the Notice board.
- iv) The procedures for evaluation and award of grades for project, In plant training, seminar and group discussion shall be decided by the respective DSB.
- v) As per the CGPA, absolute grading for the students of each class of different programme will be made on 10-point scale. The student securing maximum CGPA will get 10 points. This absolute grading will be allotted for those students who have passed all the courses prescribed for the both semester in the year and having no backlog courses.
- vi) The CGPA and percentage equivalence of grade points of the 10 point scale for the course of study shall be as given in Appendix C.
- vii) The punishment to the student for adopting unfair means at the examination shall be as mentioned in Appendix D.

## Appendix C

### PERCENTAGE EQUIVALENCE OF GRADE POINTS FOR THE TEN POINTS SCALE

The percentage equivalence of grade points for the ten points scale will be as below.

Grade Point Average	Percentage of Marks
6.25	55
6.75	60
7.25	65
7.75	70
8.25	75

- Wherever necessary the Grade Point Average (GPA) can be converted to percentage of marks as above by interpolation.
  - The class will be awarded on the basis of CGPA as below:

First Division with Distinction:	CGPA	More than 7.35
First Division	: CGPA	6.75 and less than 7.35
Second Division	: CGPA	4.5 and less than 6.75
Pass Class	: CGPA	4.0 and less than 4.5
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## Appendix-D

### UNFAIR MEANS COMMITTED BY THE STUDENT

1. The Board of Examinations shall be the competent authority to take disciplinary action against a student for his misconduct due to his unfair means committed by him at the examination conducted by the University.
2. The University Head of Department/ Principal of the college shall be the competent authority to take disciplinary action against a student for his misconduct due to his unfair means committed by him at the examination conducted by the University, recognized Institution of behalf of the University.
3. Definition- Unless the context otherwise requires
  - (a) Student means and includes a person who is enrolled as such by the University/college/Institution for receiving instruction qualifying for any degree, diploma or certificate awarded by the University. It includes ex-student and student registered as candidate (examinee) for any of the Degree, Diploma or Certificate examinations.
  - (b) Unfair Means includes one or more of the following acts or omissions on the part of student/s during the examination period.
    - i. Possessing unfair means material and or copying there from.
    - ii. Transcribing any unauthorized material or any other use thereof.
    - iii. Intimidating or using abusive language or threatening or use of violence against invigilator or person on duty for the conduct of examination or man-handling him/her or leaving the examination hall without permission of the supervisor or causing disturbances in any manner in the examination proceedings.
    - iv. Unauthorized communicating with other examinees or any one else inside or out side the examination hall.
    - v. Mutual/Mass copying
    - vi. Smuggling out, either blank or written or smuggling in of answer books as copying material.
    - vii. Smuggling in blank or written answer book forging and forging signature of the Jr. Supervisor therein.]
    - viii. Smuggling in blank or written answer book forging and forging signature of the Jr. Supervisor therein.
    - ix. Interfering with or counterfeiting of University/College Institution seal or answer books or office stationery used in the examination.
    - x. Impersonation at the University/college/Institution examination..
    - xi. Revealing identity in any form in the answer written or in any other part of the answer book by the student at the University or College or Institution examination.
    - xii. Or any other similar act/s omission/s which may be considered as unfair means by the competent authority.
  - (c) "Unfair means relating to examination" means and includes directly or indirectly communicating or attempting to commit or threatening to commit any act or coercion, undue influence or fraud or

malpractice with a view to obtaining wrongful gain to him or to any other person or causing wrongful loss to other person/s.

- (d) "Unfair means material" means and includes any material whatsoever, related to the subject of the examination, printed, typed, handwritten or otherwise on the person or on clothes, or body of the student (examinee) or on wood or other material, in any manner or in the form of chart, diagram, map or drawing or electronic aid etc. which is not allowed in the examination hall.
- (e) "Possession of unfair means material by a student" means having any unauthorized material on his/her person or desk or chair or table or at any place within his/ her reach, in the examination centre and its environs or premises at any time from the commencement of the examination till its conclusion.
- (f) "Student found in possession" means a student reported in writing as having been found in possession of unfair means material by Jr. Supervisor, Sr. Supervisor, member of the Vigilance committee or Examination squad or any other person authorized for this purpose in this behalf, even if the unfair means material is not produced as evidence because of its being reported as swallowed or destroyed or snatched away or otherwise taken away or spoiled by the student or by any other person acting on his behalf to such an extent that it has become illegible.

Provided that report to that effect is submitted by the Sr. Supervisor or chief Conductor or any other authorized person to the Controller of Examinations, University Head of Department/ Principal of the college concerned or any officer authorized in this behalf.

- (g) Material related to the subject of Examination means and includes, if the material is produced as evidence any material certified as related to the subject of examination by a competent person and if the material is not produced as evidence or has become illegible for any of the reasons referred to in clause (f) above, the presumption shall be that the material did relate to the subject of the examination.
  - (h) "Chief Conductor", means and includes, University Head of Department/ Principal of the college concerned where concerned examination is being conducted and any other person duly authorized by him or person appointed as In charge of examination, by the authority competent to make appointment to such post.
4. Where the examination of the University courses are conducted by the constituent college/recognized Institute on behalf of the University, the University Head of Department/ Principal of the college on receipt of a report regarding use of unfair means by any student at any such examination including breach of the rules laid down by the Management council or by the College/recognized institution for proper conduct of examination, shall have power at any time to institute inquiry and to punish such unfair means or breach of any of the rules by exclusion of such a student from any such examination or any University course in any college/Institution either permanently or for a specified period or by cancellation of the result of the student in the college/recognized Institution examination for which he/she appeared or by deprivation of any college/Institution scholarship or by cancellation of the award of any college/Institution prize or medal to him/her or by imposition of fine not exceeding Rs.300/- or in any two or more of the aforesaid ways.
  5. During examination, examinees and other students shall be under disciplinary control of the Chief Conductors.
  6. Chief conductor's of the examination centre shall in the case of unfair means, follow the procedure as under:-

- a) The student shall be called upon to surrender to the Chief Conductor, the unfair means material found in his or her possession, if any, and his/her answer-book.
- b) Signature of the concerned student shall be obtained on the relevant materials and list thereon. Concerned Senior Supervisor and the Chief Conductor shall also sign on all the relevant materials and documents.
- c) Statement of the student and his undertaking in the prescribed format and the statement of the concerned Jr. Supervisor and Sr. Supervisor shall be recorded in writing by the Chief Conductor (Appendix-III). If the student refuses to make statement or to give undertaking the concerned Sr. Supervisor and / or Chief Conductor shall record accordingly under their signature.
- d) Chief Conductor shall take one or more of the following decisions depending upon seriousness/gravity of the case:-
  - i) In the case of impersonation of violence, expel the concerned student from the examination and not allow him/her to appear for remaining examination.
  - ii) Obtain undertaking from the student to the effect that the decision of the concerned competent authority in his/her case shall be final and binding and allow him/ her to continue with his/ her examination.
  - iii) May report the case to the concerned Police Station as per the provision of Maharashtra Act No. XXXI 1982 – An act to provide for preventing Malpractice's at University Board and other specified examinations (Appendix-III) Proforma A& B).
  - iv) Confiscate his / her answer books mark it as suspected unfair means case and issue him/her fresh answer books duly marked.
  - v) All the material and list of material mentioned in sub-clause (a) and the undertaking with the statement of the student and that of the Jr. Supervisor as mentioned in clause no. (b) & (c) and the answer-book/s shall be forwarded by the Chief conductor along with his report to the concerned Controller of Examinations/ University Head of Department/ Principal of the college, as the case may be, in a separate and confidential sealed envelope marked " suspected unfair means case"
  - vi) In case of unfair means of oral type, the Jr. Supervisor and the Sr. Supervisor or concerned authorized person shall record the facts in writing and shall report the same to the concerned Controller of Examinations/ University Head of Department/ Principal of the college, as the case may be.

**THE BROAD CATEGORIES OF UNFAIR MEANS ADOPTED BY STUDENTS AT THE UNIVERSITY/ COLLEGE/ INSTITUTION EXAMINATION AND THE QUANTUM OF PUNISHMENT FOR EACH CATEGORY THEREOF.**

Sr. No.	Nature of Malpractices	Quantum of Punishment
1.	Possession of copying material	Annulment of the performance of the student/s at the University/ College/ Institution Examination in full:- (Note: - This quantum of punishment Shall apply also of the following categories of malpractices at Sr. No. 2, to Sr. No.12 in addition to the Punishment prescribed thereat)
2.	Actual copying from the copying material.	Exclusion of the student from university or College or Institution examination for one additional examination.
3.	Possession of another students Answer Book	Exclusion of the student from University or College or Institution examination for one additional examination (Both the students)
4.	Possession of another students Answer book+ actual evidence of Copying	Exclusion of the student from University or College or Institution examination for two additional examination (Both the Students)
5.	Mutual / Mass copying.	Exclusion of the student from University or College or Institution examination for two additional examinations.
6. (a)	Smuggling out or smuggling in of Answer book as copying material.	Exclusion of the student from University or College or Institution examination for two additional examinations.
6. (b)	Smuggling in of written answer book based on the question paper set at the examination	Exclusion of the student from University or College or Institution. Examination for three additional examinations.
7.	Attempt to forge the signature of the Jr. Supervisor on the answer book or Supplement.	Exclusion of the student from the University or College or Institution examination for four additional examinations.
8.	Interfering with or counterfeiting of University / College/ Institution seal or Answer books. Or office stationary used in the examination	Exclusion of the student from University or College or Institution examination for four additional examinations.
9.	Answer book main or supplement written Outside the examination hall or any other	Exclusion of the student from University or College or Institution examination for four additional examinations.

	insertion in answer book.	
10.	Insertion of currency notes/to bribe or attempting to bribe any of the persons/s connected with the conduct of Examination	Exclusion of the student from University or College or Institution Examination for four additional examinations. (Note:- This money shall be crated to the Vice-Chancellor's Fund
11.	Using obscene language/violence/ threat at the examination centre by a student at the University/ College / Institution Examination to Jr./ Sr. Supervisor/ Chief Conductor or Examiners.	Exclusion of the student from University or College or Institution examination for four additional Examinations.
12.(a)	Impersonation at the University/ College / Institution examination	Exclusion of the Student from University or College or Institution examination for five additional examinations, (Both the students if impersonator is University or College or Institute student)
12.(b)	Impersonation by a University/ College/ Institute student at S.S.C./ H.S.C./ any other Examinations.	Exclusion of the Student from University or College or Institution examination for
13.	Revealing identity in any form in the answer written or in any other part of the Answer book by the student at the University or College or Institution Examination	Annulment of the performance of the student at the University or College or Institution Examination in full.
14.	Student found having written on palms or on the Body, or on the clothes while in the Examination	Annulment of the performance of the student at University or College or Institution Examination in full.
15.	All other mal-practices not covered in the aforesaid categories.	Annulment of the performance of the student at the University or college or Institution Examination in full and severe punishment depending upon the gravity or the offence.
16.	If on previous occasion a disciplinary action was taken against a student for malpractice used at examination and he/she is caught again for malpractices used at the examinations, in this event he/she shall be dealt with severely. Enhanced punishment can be imposed on such student. This enhanced punishment may extend to double the punishment provided for the offence when committed at the second or subsequent examination.	
17.	<b>PRACTICAL/DISSERTATION/PROJECT REPORT EXAMS.</b>	
	Student involved in malpractices at practical/ dissertation/ project report examination shall be dealt with as per the punishment provided for the theory examination.	
18.	The competent authority in addition to the above mentioned punishments may impose a fine not exceeding	

	Rs. 300/- on the student declared guilty.
	Note:- The term annulment of performance in full includes performance of the student of the theory as well as annual practical examination, but does not include performance at term work, project work and dissertation examination unless malpractice used thereat.

#### **Instructions for preparing detailed syllabus**

- The entire syllabus for 80 marks theory paper should be divided in six units
- The entire syllabus for 40 marks theory paper should be divided in six units
- The syllabus is to submitted in the format enclosed herewith
- Wherever required the treatment expected either mathematical/theoretical needs to be mentioned
- The total syllabus needs to be of 40 hours teaching for 80 marks theory paper
- The total syllabus needs to be of 20 hours teaching for 40 marks theory paper
- At the end of the syllabus pattern of the question paper as given herewith needs to be mentioned

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I/II		
<b>Code No.:</b>	<b>Title:</b>	
<b>Teaching Scheme:</b>	<b>Class Test:</b>	
<b>Theory:</b>	<b>Theory Examination (Duration):</b>	
<b>Tutorial:</b>	<b>Theory Examination (Marks):</b>	
<b>Credits:</b>		
<b>Objectives</b>	:	
<b>Unit-I</b>	:	
<b>Unit-II</b>	:	
<b>Unit-III</b>	:	
<b>Unit-IV</b>	:	
<b>Unit-V</b>	:	
<b>Unit-VI</b>	:	
<b>Reference Books:</b>	:	
<b>Additional Reference Books</b>	:	

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.  
**All units carry equal weightage**

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

**For 40 marks Paper:**

1. Minimum eight questions
2. Four questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I/II		
<b>Code No.:</b>		<b>Title:</b>
<b>Teaching Scheme:</b>		<b>Teachers Assessment:</b>
<b>Practical/Term Work:</b>		<b>Credits:</b>
<b>Course Objectives</b>	:	
<b>List of Practicals (Not Less than 10)</b>	:	
<b>List of Reference Books</b>	:	
<b>List of Equipments /Instruments</b>	:	

The assessment of term work shall be done on the basis of the following.  
 Continuous assessment  
 Performing the experiments in the laboratory  
 Oral examination conducted on the syllabus and term work mentioned above

**PROPOSED**  
**SCHEME AND DETAILED SYLLABUS**  
**Of**  
**F. Y. B. Tech. (Chemical)**  
**OF**  
**FOUR YEAR DEGREE COURSE IN ENGINEERING & TECHNOLOGY**



**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,**  
**AURANGABAD**

**FACULTY OF ENGINEERING & TECHNOLOGY**  
Proposed Revised Structure of F. Y. B. Tech. (Chemical)

Semester - I													
Subject Code No.	Subjects	Contact Hrs/Week				Examination Scheme					Credits	Duration of Theory Exam	
		L	T	P	Tot	CT	TA	PR	ESE	Grand Total			
BSH-101	Engineering Mathematics-I	3	1	-	4	20		-	80	100	4	3 Hrs	
BED-102	Engineering Graphics	3	1		4	20		-	80	100	4	3 Hrs	
BSH-103	Applied Science	3	1		4	20		-	80	100	4	3 Hrs	
BSH-104	Organic Chemistry-I	3	1		4	20		-	80	100	4	3 Hrs	
BSH-105	Computer Fundamentals and Programming	3	1		4	20		-	80	100	4	3 Hrs	
BED-106	Basic Civil Engineering	2		-	2	10	-	-	40	50	2	2 Hrs	
BED-121	Lab I - Engineering Graphics			2	2		50	-		50	1		
BSH-122	Lab II - Applied Science			2	2		50	-		50	1		
BSH-123	Lab III - Organic Chemistry-I			2	2		50	-		50	1		
BSH-124	Lab IV- Computer Fundamentals and Programming			2	2		50	-		50	1		
SCD-141	Lab V- Development of Skills-I	-		2	2	-	50	-	-	50	1		
<b>Total of Semester-I</b>		<b>17</b>	<b>5</b>	<b>10</b>	<b>32</b>	<b>110</b>	<b>250</b>	<b>-</b>	<b>440</b>	<b>800</b>	<b>27</b>		
Semester - II													
Subject Code No.	Subjects	Contact Hrs/Week				Examination Scheme					Credits	Duration of Theory Exam	
		L	T	P	Tot	CT	TA	PR	ESE	Grand Total			
BSH-151	Engineering Mathematics-II	3	1	-	4	20		-	80	100	4	3 Hrs	
BSH-152	Physics	3	1		4	20		-	80	100	4	3 Hrs	
BSH-153	Organic Chemistry-II	3	1		4	20		-	80	100	4	3 Hrs	
BSH-154	Biological Science	3	1		4	20		-	80	100	4	3 Hrs	
BED-155	Basic Mechanical Engineering	3	1		4	20		-	80	100	4	3 Hrs	
SCD-191	Environment & Ecology	2	-		2	10		-	40	50	2	2 Hrs	
BSH-171	Lab VI- Physics			2	2		50	-		50	1		
BSH-172	Lab VII- Organic Chemistry-II			2	2		50	-		50	1		
BED-173	Lab VIII- Basic Mechanical Engineering			2	2		50	-		50	1		
BED-174	Lab IX- Workshop Practice	-	-	2	2	-	50	-	-	50	1		
SCD-192	Lab X- Development of Skills-II	-	-	2	2	-	50	-	-	50	1		
<b>Total of Semester-II</b>		<b>17</b>	<b>5</b>	<b>10</b>	<b>32</b>	<b>110</b>	<b>250</b>	<b>-</b>	<b>440</b>	<b>800</b>	<b>27</b>		
<b>Grand Total of I &amp; II</b>										<b>1600</b>	<b>54</b>		

**Periods**

L: Lecture hours per week

T: Tutorial hours per week

P: Practical hours per week

Class Test Duration: 1 hour

**Evaluation Scheme**

TA: Teachers Assessment

CT: Class Test

PR: Practical

TOT: Total for sessional exam of evaluation scheme

ESE: End Semester Examination

**Note:**

BSH: Basic Science &amp; Humanities

BED: Basic Engineering Division

SCD: Supporting Courses Division

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I						
Code No. BSH-101		Title: Engineering Mathematics-I				
<b>Teaching Scheme:</b>		<b>Class Test: 20 Marks</b>				
<b>Theory: 3 hours/week</b>		<b>Theory Examination (Duration): 3 hours</b>				
<b>Tutorial: 1 hours/week</b>		<b>Theory Examination (Marks): 80 Marks</b>				
<b>Credits: 4</b>						
<b>Objectives</b>	:	The contents aims to develop the knowledge of students in the direction of solving the practical problems in chemical technology				
<b>Unit-I</b>	:	<b>Complex Number:</b> Introduction to complex numbers, polar form, De-moiver's theorem, Roots of complex number Circular, hyperbolic and inverse hyperbolic functions, Relation between circular and hyperbolic functions, separation of real and imaginary parts, logarithm of complex quantity.				
		<b>(10 Hrs)</b>				
<b>Unit-II</b>	:	<b>Differential calculus:</b> $n^{\text{th}}$ derivatives, Leibnitz's theorem, Taylor's and Maclaurin's theorem. Expansion of functions using (i) Standard series (ii) method of differentiation and integration (iii) Method of substitution. Indeterminate forms				
		<b>(10 Hrs)</b>				
<b>Unit-III</b>	:	<b>Partial Differentiation:</b> Partial derivatives, Total derivatives, Euler's theorem on homogeneous functions. Implicit function, change of independent variables. Maxima and Minima of functions of two independent variables, jacobians.				
		<b>(10 Hrs)</b>				
<b>Unit-IV</b>	:	<b>Differential Equations:</b> Differential equations of first order and first degree (non-homogeneous), Exact, linear and Reducible to linear form. Application to Mechanics and Electrical circuit. orthogonal trajectories				
		<b>(10 Hrs)</b>				
<b>Unit-V</b>	:	<b>Matrices:</b> Rank of a matrix, canonical and normal form of matrix. Solution of simultaneous linear equations (homogeneous and non-homogeneous) linear dependence and independence of the vectors, Cayley-Hamilton theorem. Inverse by Cayley-Hamilton theorem				
		<b>(10 Hrs)</b>				
<b>Unit-VI</b>	:	<b>Infinite Series:</b> Introduction to infinite sequence and infinite series. Convergence, divergence and oscillatory series. P-series, comparison test, D'Alembert's Ratio test, Raabes's test, $n^{\text{th}}$ root test. Absolute and conditional convergence.				
		<b>(10 Hrs)</b>				
<b>Text Books and Reference</b>	:	<b>SN</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>	<b>Edition</b>
		1	A text book of Applied Mathematics volume I	J.N. Wartiker P. N. Wartikar	Pune vidyarthi griha prakashan	9 <sup>th</sup>
		2	A Text Book of Engineering Mathematics	N.P. Bali Harish goyal	Laxmi Publication Ltd.,	7 <sup>th</sup>
		3	Higher Engineering Mathematics	B.V. Ramana	Tata Mc-Graw Hill Publication Co., Ltd.,	1 <sup>st</sup>
		4	Advance Engineering Mathematics	H.K. Dass	S. Chanda and Co. ltd.,	18 <sup>th</sup>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.  
**All units carry equal weightage**

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I	
<b>Code No. BED-102    Title: Engineering Graphics</b>	
<b>Teaching Scheme:</b>	
<b>Theory: 3 hours/week</b> <b>Tutorial: 1 hours/week</b> <b>Credits: 4</b>	<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 hours</b> <b>Theory Examination (Marks): 80 Marks</b>
<b>Objectives</b>	: The objective of learning this subject at undergraduate level is to develop vision, imagination and presentation skill required for drawing and presentation of various engineering components in 2-D and 3-D by using first angle method of projections only except for projections of straight lines
<b>Unit-I</b>	: PROJECTIONS OF STRAIGHT LINES –line inclined to one plane, line inclined to both the reference planes, and in different quadrants, traces of a line. <b>(10 Hrs)</b>
<b>Unit-II</b>	: PROJECTIONS OF PLANES –Planes with surface inclined to both the planes. Planes such as- triangles, squares, rectangles, quadrilaterals, pentagon, hexagon, circle, semicircle. <b>(09 Hrs)</b>
<b>Unit-III</b>	: PROJECTIONS OF SOLIDS –Projections of solids such as prism, cylinder, pyramid, cone, sphere, frustum, cube tetrahedron, with axis inclined to one or both the reference planes. <b>(11 Hrs)</b>
<b>Unit-IV</b>	: SECTIONS OF SOLIDS –Projections of regular solids such as prism, cylinder, pyramid, cone, cube, tetrahedron, cut by cutting planes inclined to one plane. Determination of cutting plane angle from the given true shape of the section. DEVELOPMENT OF SURFACES – Development of surfaces of various regular solids, development of surfaces of cut solids such as prism, cylinder, pyramid and cone. <b>(12 Hrs)</b>
<b>Unit-V</b>	: ORTHOGRAPHIC PROJECTIONS: - Obtaining orthographic projections of different machine parts from the given 3D view, sectional orthographic projections. <b>(10 Hrs)</b>
<b>Unit-VI</b>	: ISOMETRIC PROJECTIONS: - Introduction to isometric projections and isometric views, isometric and nonisometric lines. Drawing Isometric views of simple machine parts. <b>(08 Hrs)</b>

Reference Books:	SN	Title	Author	Publication
	1	Elementary Engineering Drawing	N D Bhatt	Charotar Publication House
	2	A Text Book of engineering Graphics	M L Dhabhade	Association of Technical Authors, Pune
	3	Engineering Drawing	Mali & Chaudhary	Vrinda Publishers
	4	Engineering Drawing	Basant Agrawal C. M. Agrawal	Tata McGraw-Hill Education, 2008
	5	Engineering Drawing	M. B. Shah, B. C. Rana	Pearson Education India
	6	Engineering Drawing	Dhananjay A. Jolhe	Tata McGraw-Hill Education
	7	Engineering Drawing	B. V. R. Gupta M. Raja Roy	I. K. International Pvt. Ltd

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**All units carry equal weightage**

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I	
<b>Code No. BSH-103    Title: Applied Science (Physical &amp; Inorganic Chemistry)</b>	
<b>Teaching Scheme:</b>	
<b>Theory: 3 hours/week</b> <b>Tutorial: 1 hours/week</b> <b>Credits: 4</b>	<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 hours</b> <b>Theory Examination (Marks): 80 Marks</b>
<b>Objectives</b>	: Chemistry is very essential in our day today life. A branch of Chemistry-Physical Chemistry gives us the theoretical basis for all of chemistry and many subjects related to it, whereas Inorganic Chemistry deals with the study of different elements in periodic table from various views. Here special attention has been given to those chapters dealing with basic aspects of chemistry.
<b>Unit-I</b>	: Structure-Property relationship, molecular interactions and bonds weaker than covalent bonds e.g. hydrogen bond, dipole interaction etc and their effects on various properties such as refractive index, viscosity, surface tension, density, thermal conductivity, specific heat, melting point, and boiling point. Methods for estimation of these properties. <span style="float: right;">(10 Hrs)</span>
<b>Unit-II</b>	: <b>Chemical Kinetics and Catalysis:</b> Concept of reaction rates and extent of reaction, simple rate equations, factors affecting rate of reactions, order and molecularity of a reaction, effect of temperature and catalyst on reaction rates, Introduction to catalyst, types of catalyst, concept of acid – base catalysis. <span style="float: right;">(10 Hrs)</span>
<b>Unit-III</b>	: <b>Surface Chemistry:</b> Concept of Surface/interfacial tension and Surface/interfacial energy, contact angle and wetting phenomenon: adhesion and cohesion. Colloidal systems: various types, electrokinetic properties of colloidal systems (electrophoresis, electro-osmosis), surfactants – emulsifiers - gel types and applications of colloidal. <span style="float: right;">(10 Hrs)</span>
<b>Unit-IV</b>	: Periodic Table, s, p, d, and f elements & their general properties. <b>Main Group chemistry:</b> Chemistry of Group IA, IIB and Group IIIB <span style="float: right;">(10 Hrs)</span>
<b>Unit-V</b>	: <b>Chemical Bonding:</b> Valence Bond theory and Molecular Orbital theory Co-ordination Chemistry: Nomenclature, Werner theory, VSEPR, Crystal field theory <span style="float: right;">(10 Hrs)</span>
<b>Unit-VI</b>	: <b>Organometallics:</b> Metal Ligand concept, types of Ligands, Effective atomic number rule, Concept of sigma bond and pi bond formation. <span style="float: right;">(10 Hrs)</span>
<b>Reference Books:</b>	: <ol style="list-style-type: none"> <li>1. Physical Chemistry : P.W. Atkins-J.D. Paula</li> <li>2. Physical Chemistry, P.W. Atkins and J. D. Paula, 8<sup>th</sup> Edition, Oxford University Press.</li> <li>3. Physical Chemistry, K.J. Laidler and J.M. Meiser, 2<sup>nd</sup> Edition, CBS Publishers</li> <li>4. Physical Chemistry: A Molecular Approach, D.A. Mcquarrie and J.D. Simon</li> <li>5. Chemical Kinetics and Catalysis, R.J. Masel, John Wiley and Sons</li> <li>6. Chemical Kinetics and Reaction dynamics, Paul H. Houston, McGraw Hill</li> <li>7. Catalytic Chemistry, Bruce C Gates, John Wiley and Sons</li> </ol>

		8. Principles of Heterogeneous Catalysis, J.M. Thomas and W.J. Thomas, John Wiley and Sons. 9. Properties of Gases and Liquids Reid R.C. and Sherwood T.K 10. Principles of Inorganic Chemistry- by Puri, Sharma, Kaliya 11. Modern Inorganic Chemistry- by Madan, Malik, Tuli 12. Concise Inorganic Chemistry, J.D. Lee, Wiley India Edition 13. Basic Inorganic Chemistry, F. A. Cotton and G. Wilkinson, John Wiley and Sons
<b>Additional Reference Books</b>	:	1. Essentials of Physical Chemistry : Bahl-Tuli-Bhal 2. Principles of Physical Chemistry : Puri-Sharma-Pathania 3. Advanced Physical Chemistry : J.N. Gurtu-A. Gurtu 4. Advanced Physical Chemistry : Gurudeep and Raj

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**All units carry equal weightage**

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I	
Code No. BSH-104    Title: Organic Chemistry-I	
<b>Teaching Scheme:</b>	
<b>Theory:</b> 3 hours/week	<b>Class Test:</b> 20 Marks
<b>Tutorial:</b> 1 hours/week	<b>Theory Examination (Duration):</b> 3 hours
<b>Credits:</b> 4	<b>Theory Examination (Marks):</b> 80 Marks
<b>Objectives</b>	: To Understand the basic knowledge of organic reaction and its mechanism
<b>Unit-I</b>	: <b>IUPAC Nomenclature:</b> Nomenclature of organic compounds, Nomenclature of polycyclic compounds. <span style="float: right;">(10 Hrs)</span>
<b>Unit-II</b>	: <b>Reaction intermediates:</b> Generation, Structure, Stability and Reactions of Free radical, Carbocation and Carbanion. <b>Types of organic reaction:</b> Substitution reaction, Addition reactions, Elimination reaction and-Rearrangement reactions. <span style="float: right;">(10 Hrs)</span>
<b>Unit-III</b>	: <b>Mechanism of organic reaction:</b> Inductive effect, Effect of inductive effect on reactivity of alkyl halide, dipole moment and strength of carboxylic acids. Mesomeric effect, Electromeric effect, Hyper conjugation. <b>Free radical substitution reactions:</b> Mechanism of chlorination of methane and allylic bromination by N.B.S. <b>Nucleophilic substitution reactions:</b> Mechanism of SN <sup>1</sup> , SN <sup>2</sup> and SN <sub>i</sub> reaction, factors affecting on rate of SN <sup>1</sup> and SN <sup>2</sup> reaction. <b>Elimination reactions:</b> Mechanism of E <sub>1</sub> , E <sub>2</sub> and E <sub>1</sub> CB reactions. <span style="float: right;">(10 Hrs)</span>
<b>Unit-IV</b>	: <b>Saturated hydrocarbons:</b> Introduction, Natural source of alkanes, General methods of preparation of alkanes: Hydrogenation of unsaturated hydrocarbon, Reduction of alkyl halide, Wurtz reaction, Frankland reaction, Kolbes electrolysis, from Grignard reagent, Clemensons and Wolf Kishner reduction. General characteristic of alkanes. Reactions of alkanes: Bromination of ethane and propane, Combustion and Cracking, Isomerisation and Aromatization. Natural gas, LPG, knocking, octane number and flash point. <span style="float: right;">(10 Hrs)</span>
<b>Unit-V</b>	: <b>Preparation and chemical properties:</b> <b>Alcohols:</b> Hydroboration, Hydration, Hydrolysis of alkyl halide. Dehydration of alcohol and oxidation. <b>Aldehydes:</b> Dehydrogenation of alcohol. Hydration of alkyne, Oxo process, reaction with Hydroxyl amine. Phenyl Hydrazine, Grignard reagent, Addition of Hydrogen cyanide. <b>Ketones:</b> Oxidation of alcohol, Catalytic Decomposition of Acids, Addition of sodium bisulphite, phenyl hydrazine, Hydroxylamine. <span style="float: right;">(10 Hrs)</span>
<b>Unit-VI</b>	: <b>Amines:</b> Preparations from alkyl halide, reduction of Nitriles. Basicity of Amines. <b>Chemical Properties:</b> Salt formation, reaction with nitrous Acid, Carbylamine reaction. <b>Carboxylic acids:</b> Structure and bonding of carboxylic group, Acidity of carboxylic

		acid, Preparation of carboxylic acid: Hydrolysis of Ester, From dry ice, From nitriles. Chemical Properties: Esterification with mechanism, Decarboxylation of mono and dicarboxylic acid. <b>(10 Hrs)</b>
<b>Reference Books:</b>	:	Modern Organic chemistry By Jain And S.C. Sharma, Advance Organic chemistry by Sachin Kumar Ghosh, Organic chemistry by L. G. Wade. Organic chemistry by Morrison and Boyd's, Organic chemistry by Jerry March, Organic chemistry by Francis and Carry.
<b>Additional Reference Books</b>	:	Organic Chemistry by Clayden, Greeves, Warren and Wothers. Organic chemistry by Peter Sykes.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

All units carry equal weightage .

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I	
<b>Code No. BSH-105    Title: Computer Fundamentals and Programming</b>	
<b>Teaching Scheme:</b>	
<b>Theory:</b> 3 hours/week <b>Tutorial:</b> 1 hours/week <b>Credits:</b> 4	<b>Class Test:</b> 20 Marks <b>Theory Examination (Duration):</b> 3 hours <b>Theory Examination (Marks):</b> 80 Marks
<b>Objectives</b>	: 1. To be conversant with the fundamentals of computers. 2. To develop programming skills in 'C' language.
<b>Unit-I</b>	: <b>Introduction</b> <b>Computers:</b> What is a computer, Evolution of computers, Types of computers, computer hardware, computer software & its types. <b>Programming Languages:</b> Generations of Programming languages, Five phases of system development life cycle. <b>Algorithms and Flowcharts:</b> What is an algorithm, uses of algorithms, flowchart symbols. <div style="text-align: right;"><b>(06 Hrs)</b></div>
<b>Unit-II</b>	: <b>Introduction to C:</b> The C character set, constants, variables, keywords and operators, Basic data types, Instructions, Type conversion, The C program structure, and Simple C program. <div style="text-align: right;"><b>(10 Hrs)</b></div>
<b>Unit-III</b>	: <b>The Decision control structure:</b> The if-statement, the if-else statement, use of logical operators, conditional operator. The Decision control and loop Control structure The if-statement, the if-else statement, Loops- While, for and do-while loops, Break statement, Case control structure, Switch and goto statement. <b>The loop and case control structures:</b> Loops- While, for and do-while loops, Break statement, continue statement, Switch and goto keyword The if-statement, the if-else statement, Loops- While, for and do-while loops, Break statement, Case control structure, Switch and goto statement. <div style="text-align: right;"><b>(14 Hrs)</b></div>
<b>Unit-IV</b>	: <b>Arrays:</b> Array initialization, Bounds checking, One Dimensional Array and Two Dimensional Array. <b>Strings</b> What are Strings, Standard Library Functions -strlen(), strcpy(), strcat(), strcmp(), strcmp(). <div style="text-align: right;"><b>(09 Hrs)</b></div>
<b>Unit-V</b>	: <b>Functions and Pointers:</b> What is a function-why to use functions, Passing values between functions-Scope Rule of functions, Advanced features of functions-function declaration and Prototypes, Introduction to Pointers, Pointer notation, Recursion, Call by Value and Call by Reference, Passing Array Elements to a function. <div style="text-align: right;"><b>(13 Hrs)</b></div>
<b>Unit-VI</b>	: <b>Structures:</b> Why to use Structures-Declaring a Structure , Accessing Structure elements, How Structure elements are stored, Array of Structures, Additional features of Structures. <div style="text-align: right;"><b>(08 Hrs)</b></div>

<b>Reference Books:</b>	:	<b>SN</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>	<b>Edition</b>
		1	Introduction to computers	Peter Norton	Tata McGrawHill	Fourth edition
		2	Let us C	Yashawant Kanetkar	BPB	Eighth edition
		3	Programming in C	E.Balagurusamy	Tata McGrawHill	Fourth edition
		4	Using Turbo C	Herbert schildt	PHI	Fourth edition

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**All units carry equal weightage**

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II		
Code No. BED-106		Title: Basic Civil Engineering
Teaching Scheme:		Class Test: 10 Marks
Theory: 2 hours/week		Theory Examination (Duration): 2 hours
Credits: 2		Theory Examination (Marks): 40 Marks
Objectives	:	Create awareness and knowledge in students about basic civil engineering terminologies and techniques which will be helpful in their day to day life.
Unit-I	:	<b>Civil Engineering Materials:</b> Study of properties and use of civil engineering materials namely bricks, rubble, cement, sand, coarse aggregate. <span style="float: right;">(5 Hrs)</span>
Unit-II	:	<b>Foundation:</b> Introduction to foundation and types, isolated, footing, combined footings, cantilever footing. Pile foundation – types <span style="float: right;">(5 Hrs)</span>
Unit-III	:	<b>Masonry:</b> Introduction to brick masonry and bonds in brick, header bond, stretcher bond, English and Flemish bond. <span style="float: right;">(5 Hrs)</span>
Unit-IV	:	<b>Lintels, Doors and windows:</b> Types of lintels, definition of technical terms of doors and windows, study of battened, ledged and braced doors casement windows, glazed window, and metal windows. <span style="float: right;">(4 Hrs)</span>
Unit-V	:	<b>Roofs and floors:</b> Trussed roofs, king post roof truss and queen post roof truss, flat RCC roof, components of floor, material for construction of floor. <span style="float: right;">(5 Hrs)</span>
Unit-VI	:	<b>Surveying &amp; Leveling</b> i) <b>Surveying:</b> Length measurement use of metallic tape and chain (20m & 30m). ii) <b>Angular Measurements:</b> Use of prismatic compass, simple problems iii) <b>Level measurements:</b> Use of dumpy level, simple problems on calculation of reduced levels. <span style="float: right;">(6 Hrs)</span>
Reference Books:	:	1) Building Materials- Dr. K.A. Patil & I.K. Pateriya 2) Building Construction- B.C. Punmia 3) Building Construction- Sushil Kumar 4) Surveying & Leveling- B.C. Punmia 5) Surveying & leveling- N.N. Basak

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

All units carry equal weightage

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 40 marks Paper:**

1. Minimum eight questions
2. Four questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I	
Code No. BED-121	Title: Lab I - Engineering Graphics
Teaching Scheme:	Teachers Assessment: 50 Marks
Practical/Term Work: 2 hours/week	Credits: 1
<b>Course Objectives</b>	: The objective of learning this subject at undergraduate level is to develop vision, imagination and presentation skill required for drawing and presentation of various engineering components in 2-D and 3-D by using first angle method of projections only except for projections of straight lines.
<b>List of Practicals (Not Less than 10)</b>	: <ol style="list-style-type: none"> <li>1. <b>Sheet No. 1: Projections of Lines:</b> To solve at least two problems based on line inclined to both the planes and one problem on applications of straight lines, with following objectives,               <ol style="list-style-type: none"> <li>i. Obtaining projections of line inclined to both the planes,</li> <li>ii. Determination of true length and true inclinations of the line,</li> <li>iii. Locating traces of the line, and its use for obtaining true length and inclination of the line.</li> <li>iv. To understand applications of straight lines.</li> </ol> </li> <li>2. <b>Sheet No. 2: Projections of Planes:</b> To solve at least three problems on planes inclined to both the reference planes, with following objectives,               <ol style="list-style-type: none"> <li>i. Obtaining projections of planes of different (polygonal, circular, semicircular etc.) shapes, inclined to both the planes.</li> <li>ii. Determination of true shape and inclinations of the plane.</li> </ol> </li> <li>3. <b>Sheet No. 3: Projections of Solids:</b> To solve at least three problems based on solids with axis inclined to both the reference planes, with following objective,               <ol style="list-style-type: none"> <li>i. Obtaining projections of different regular geometrical solids, having axis inclined to both the reference planes.</li> </ol> </li> <li>4. <b>Sheet No. 4: Sections of Solids:</b> At least two problems to be solved on sections of solids, with following objectives,               <ol style="list-style-type: none"> <li>i. Drawing section line view of the cutting plane in correct view,</li> <li>ii. Drawing sectional view, and true shape of the section,</li> <li>iii. Determining inclination of the cutting plane from the given true shape of the section.</li> </ol> </li> <li>5. <b>Sheet No. 5: Development of Surfaces:</b> At least two problems to be solved on               <ol style="list-style-type: none"> <li>i. Drawing the development of the cut solid,</li> <li>ii. Drawing the FV and TV from the given development.</li> </ol> </li> <li>6. <b>Sheet No. 6: Orthographic and Sectional Orthographic Projections:</b> At least two problems to be solved on , orthographic projections and sectional orthographic projections, with following objective,               <ol style="list-style-type: none"> <li>i. Reading the 3D drawings and converting it in 2D views.</li> </ol> </li> <li>7. <b>Sheet No. 7: Isometric Views:</b> Solving at least one problem for isometric view, and one for isometric projections for simple machine parts with following objective,               <ol style="list-style-type: none"> <li>i. Reading the 2D drawings and converting it in 3D views.</li> </ol> </li> </ol>

List of Reference Books	SN	Title	Author	Publication
	1	Elementary Engineering Drawing	N D Bhatt	Charotar Publication House
	2	A Text Book of engineering Graphics	M L Dhabhade	Association of Technical Authors, Pune
	3	Engineering Drawing	Mali & Chaudhary	Vrinda Publishers
	4	Engineering Drawing	Basant Agrawal C. M. Agrawal	Tata McGraw-Hill Education, 2008
	5	Engineering Drawing	M. B. Shah, B. C. Rana	Pearson Education India
	6	Engineering Drawing	Dhananjay A. Jolhe	Tata McGraw-Hill Education
	7	Engineering Drawing	B. V. R. Gupta M. Raja Roy	I. K. International Pvt. Ltd

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above



<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I		
<b>Code No. BSH-123</b>		<b>Title: Lab III- Organic Chemistry-I</b>
<b>Teaching Scheme:</b>		<b>Teachers Assessment: 50 Marks</b>
<b>Practical/Term Work: 2 hours/week</b>		<b>Credits: 1</b>
<b>Course Objectives</b>	:	Student should understand qualitative and quantitative analysis of different organic compounds.
<b>List of Practicals (Not Less than 10)</b>	:	1) Identification of organic compound through elemental analysis, group detection , physical constant and derivatization.(Minimum 08 compounds) 2) Estimations a) . Determination of equivalent weight of organic acid. b) Determination of equivalent weight of ester by saponification. c) Estimation of glucose by Fehling solution. d) To estimate the saponification value of the given oil. e) Estimation of Ascorbic acid by iodine solution.
<b>List of Reference Books</b>	:	Qualitative organic analysis by I. Vogel Quantitative organic analysis by I. Vogel

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<p align="center"><b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering &amp; Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I</p>																								
Code No. BSH-124		Title: Lab IV- Computer Fundamentals and Programming																						
Teaching Scheme:		Teachers Assessment: 50 Marks																						
Practical/Term Work: 2 hours/week		Credits: 1																						
Course Objectives	:	Term work shall consists of record of the experiments carried out during the course, which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment																						
List of Practicals (Not Less than 10)	:	<ol style="list-style-type: none"> <li>1) If a five-digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. For example if the number that is input is 12391 then the output should be displayed as 23402.</li> <li>2) If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is valid or not. The triangle is valid if the sum of two sides is greater than the largest of the three sides.</li> <li>3) Write a program to print all the ASCII values and their equivalent characters using a while loop. The ASCII values vary from 0 to 255.</li> <li>4) Write a program to print the multiplication table of the number entered by the user. The table should get displayed in the following form 11 * 1 =11 11 * 2 = 22</li> <li>5) Write a menu driven program which has following options: \ <ol style="list-style-type: none"> <li>1. Addition of two integers</li> <li>2. Subtraction</li> <li>3. Multiplication</li> <li>4. Exit</li> </ol>                     Make use of switch statement.</li> <li>6) A positive integer is entered through the keyboard; write a function to find the binary equivalent of this number using recursion.</li> <li>7) Write a program to pick up the largest number from any n row by n column matrix.</li> <li>8) Write a program that replaces two or more consecutive blanks in a string by a single blank.</li> <li>9) Find the smallest number in an array using pointers.</li> <li>10) Write a program that compares two given dates. To store date use structure say date that contains three members namely date, month and year. If the dates are equal then display message as "Equal" otherwise "Unequal"</li> </ol>																						
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- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above



List of Reference Books	Sr. No.	Title	Author	Publication
	1	The Essence of Effective Communication	Adrian Budday, Ron Ludlow and Fergus' Panton	Prentice Hall of India-Private Ltd.
	2	Communicating in Style	Yateendra Joshi	The energy Resource Institute
	3	Effective Technical Communication	Anne Eisenberge	Mc Graw Hill International Editors
	4	Professional Communication Skills	A. K. Jain, Pravin, S. R. Bhatia, A. M. Sheikh	S. Chand & Company Ltd.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II						
Code No. BSH-151 Title: Engineering Mathematics-II						
<b>Teaching Scheme:</b>		<b>Class Test: 20 Marks</b>				
<b>Theory: 3 hours/week</b>		<b>Theory Examination (Duration): 3 hours</b>				
<b>Tutorial: 1 hours/week</b>		<b>Theory Examination (Marks): 80 Marks</b>				
<b>Credits: 4</b>						
<b>Objectives</b>	:	The contents aims to develop the knowledge of students in the direction of solving the practical problems in chemical technology				
<b>Unit-I</b>	:	<b>Linear Differential Equations:</b> $n^{\text{th}}$ order differential equations with constant coefficients canchy's and legendre's forms, Method of variation of parameters. (10 Hrs)				
<b>Unit-II</b>	:	<b>Partial differential equations:</b> Method of separation of variables. Application to wave equation of vibrating string, one dimensional heat flow, two dimensional heat flow. (10 Hrs)				
<b>Unit-III</b>	:	<b>Integral calculus :</b> Beta and Gamma functions, Relation between beta and gamma functions Reduction formula of the form $\int_0^{\pi/2} \text{Sin}^m x, \text{Cos}^n x \, dx$ (10 Hrs)				
<b>Unit-IV</b>	:	<b>MultipaleIntegrals :</b> double integration, Triple integration, double integration in polar coordinates, change of order of integration, chaning to polar coordinates. Application to areas, volumes, surface area and volume of solid of revolution. (10 Hrs)				
<b>Unit-V</b>	:	<b>Curve Tracing :</b> Tracing of curves in eartesion, polar and parametric forms rectification and intrinsic equations (10 Hrs)				
<b>Unit-VI</b>	:	<b>Forrierieseries :</b> fourier series of a function, fourier series of ever and odd function in the interval $(-L, L)$ , Half range expansion, forier sine and consine series. Change of interval. (10 Hrs)				
<b>Text Books and Reference</b>	:					
		SN	Title	Author	Publication	Edition
		1	A Text Book of Applied Mathematics II volume II	P.N. Wartikar J.N. Walikar	Pune VidyarathiGrihaPrakashan	9 <sup>th</sup>
		2	A text book of Engineering Mathematics	N.P. Bali MansishGoyal	Laxmi Publication Ltd.,	7 <sup>th</sup>
		3	Advance Mathematics Engineering	H.K. Dass	S.Chand and C.ltd.,	18 <sup>th</sup>
	4	Higher Engineering Mathematics	B.V. Ramana	Tata Mc-Graw Hill publishing co., ltd.,	1 <sup>st</sup>	

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.  
**All units carry equal weightage**

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II	
<b>Code No. BSH-152 Title: Physic</b>	
<b>Teaching Scheme:</b> Theory: 3 hours/week Tutorial: 1 hours/week Credits: 4	<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 hours</b> <b>Theory Examination (Marks): 80 Marks</b>
<b>Objectives</b>	: 1. Introduction of Physics in the curriculum intends to study physical properties of material and basic facts, concepts, law, principles of scientific investigation of physical quantities required in engineering. 2. Physics is the base of all engineering branches hence knowledge of various segments of physics is must for all engineers. 3. To accurately learn to relate the engineering applications with physics
<b>Unit-I</b>	: <b>Optics Interference:</b> Interference in thin film, phase reversal, Newton's ring in reflected light, application-wavelength determination, refractive index, optical flatness. <b>Diffraction:</b> diffraction of light, Fresnel and Fraunhofer diffraction (only definition) diffraction grating, grating theory. <b>Polarisation:</b> Polarization, Double refraction, Nicol prism, polarimeter, optical activity and specific rotation, Laurents half shade polarimeter. <b>Laser:</b> Properties of laser, absorption, spontaneous & stimulated emission, meta stable state, populationinversion, activemedium, pumping, resonantcavity, rubylaser, He-Ne laser, application construction. (12 Hrs)
<b>Unit-II</b>	: <b>Superconductivity:</b> Phenomenon, zero electrical resistivity, effect of temperature and magnetic fields, Messiner effect, Silsbee rule, type I & II ,critical temperature ,critical field superconductors, applications. <b>Acoustics and Ultrasonics:</b> Reverberation and reverberation time, absorption coefficient, sabine's formula (derivation not necessary) acoustical design of hall. <b>Ultrasonic:</b> Properties, piezoelectric transducer, magnetosriction transducer, applications. (12 Hrs)
<b>Unit-III</b>	: <b>X-Rays and Crystal Structure:</b> Crystalline & Amorphous material, periodicity in crystal, geometry of space lattice, unit cell, Crystal symmetry, Miller indices. X- Rays: Continuous & characteristics spectra, Bragg's law, Bragg's spectrometer, powder crystal method. (06 Hrs)
<b>Unit-IV</b>	: <b>Nuclear Physics:</b> Nuclear fission and fusion ,chain reaction ,controlled and uncontrolled chain reaction ,multiplication factor ,nuclear reactor ,P-P cycle ,C-N cycle, Accelerators-cyclotron, betatron. <b>Modern Physics:</b> Wave particle duality, De- Broglie concept of matter wave, matter wave & their properties, Davission –Germer experiment .Heisenberg uncertainty principle, Schrodinger time independent equation & its application to a particle in a box. (10 Hrs)
<b>Unit-V</b>	: <b>Dielectrics</b> : Introduction, Dielectrics parameters-(dielectric strength, dielectric constant) Types of Polarization-(electronic, ionic, & orientation Polarization.) , Effect of temperature & frequency on Polarization , dielectric breakdown <b>Magnetic materials:</b> Ferrites, soft & hard magnetic materials & their application.

		<b>Semiconductors, Nanotechnology:</b> Semiconductors, Diode & zener diode their characteristics, transistor & its action, Hall effect, Hall Coefficient. <b>Nanotechnology :</b> Introduction to nanotechnology & applications <b>(10 Hrs)</b>																																																										
<b>Unit-VI</b>	:	<b>Fiber Technology:</b> Propagation of light through optical fiber, acceptance angle and cone numerical aperture, types, optical fiber communication system, applications. <b>Electron Optics :</b> Electron refraction – Bethe's law, electron gun, cathode ray tube (CRT – Construction & working), electron microscope (Construction, working & application.), determination of $e/m$ Thomson's method, positive rays production & properties, Bainbridge mass spectrograph <b>(10 Hrs)</b>																																																										
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The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II	
Code No. BSH-153    Title: Organic Chemistry-II	
<b>Teaching Scheme:</b> Theory: 3 hours/week Tutorial: 1 hours/week Credits: 4	<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 hours</b> <b>Theory Examination (Marks): 80 Marks</b>
<b>Objectives</b>	: Most of the drugs contains Aromatic heterocycles student should understand its stereochemistry and properties.
<b>Unit-I</b>	: <b>Stereochemistry of organic compounds:</b> Introduction, Element of symmetry, classification of stereo isomers on the basis of symmetry and energy criteria, optical activity, stereogenic centre, enantiomers, distereoisomers, Chiral and achiral compounds with two stereogenic centres, threo and erythro distereoisomers, Fischers and Newman projection formulae, Racemization. Configurational nomenclature: D and L nomenclature, R and S nomenclature. Geometrical isomerism in alkanes and E and Z nomenclature, conformations of ethane and butane. (10 Hrs)
<b>Unit-II</b>	: <b>Unsaturated Hydrocarbons</b> Introduction, Isomerism in alkenes, Method of preparation of alkenes: Dehydration of alcohol with mechanism, dehydrohalogenation of alcohol and electrolysis of salt of dicarboxylic acid. Chemical reaction: Addition of hydrogen, hydrohalogenation( with mechanism), Addition of water, Oxymercuration and demercuration, polymerization of alkenes. Diels Alder reaction. Structure of ethylene, Methods of preparations of alkynes: Dehydrohalogenation of dihalide, Kolbes method, from iodoform. Chemical reaction of Alkynes: Formation of sodium acetylides, addition of hydrogen, addition of water and addition of ozone. (10 Hrs)
<b>Unit-III</b>	: <b>Arens and Aromaticity</b> Classification of aromatic compound, Kekules structure of benzene, Resonance in benzene, structure of benzene, $\pi$ orbital picture of benzene, Nomenclature of substituted derivatives of benzene, Huckels rule. Reaction of benzene: Free radical chlorination, Birch reduction. Mechanism of electrophilic substitution reactions of benzene: Sulphonation, Bromination, Nitration, Friedal Craft alkylation and Friedal Craft acylation. Polymerization of styrene, kinetic and thermodynamic control acetylation of Naphthalene. (10 Hrs)
<b>Unit-IV</b>	: <b>Heterocyclic compounds:</b> Introduction, Nomenclature of one or two heteroatom containing five and six member ring. Structure, preparation and reaction of Furan, Pyrrole, Thiophene and pyridine. Synthesis and reactions of Quinoline. Basicity of nitrogen heterocycles. (10 Hrs)
<b>Unit-V</b>	: <b>Oxidation and Reduction :</b> Use of following reagent in chemical reaction. $\text{KMnO}_4$ , $\text{K}_2\text{Cr}_2\text{O}_7$ , $\text{NaBH}_4$ and $\text{LiAlH}_4$ (10 Hrs)

<b>Unit-VI</b>	:	<b>Name reaction with Mechanism :</b> Aldol condensation, Cannizzaro Reaction, Beckmann rearrangement, Fries rearrangement Reimer-Tiemann reaction, Claisen condensation.	<b>(10 Hrs)</b>
<b>Reference Books:</b>	:	Organic chemistry by <i>Solomons Fryhle</i> , Stereochemistry by <i>Nasipuri</i> Stereochemistry by <i>P.S. Kalsi</i> Heterocyclic chemistry by <i>Gupta</i> Reaction mechanism by <i>P.S. Kalsi</i> Organic chemistry by <i>Paula Bruice</i> Organic Chemistry by <i>Clayden, Greeves, Warren and Wothers</i>	
<b>Additional Reference Books</b>	:	Stereochemistry by <i>E. L. Eliel</i>	

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
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4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II	
<b>Code No. BSH-154 Title: Biological Science</b>	
<b>Teaching Scheme:</b> Theory: 3 hours/week Tutorial: 1 hours/week Credits: 4	<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 hours</b> <b>Theory Examination (Marks): 80 Marks</b>
<b>Objectives</b>	: 1) To impart/acquaint students with basic knowledge of biochemistry for its application in Pharmaceutical and food technology 2) To impart/acquaint students with basic knowledge of microbiology for its application in Pharmaceutical and food technology.
<b>Unit-I</b>	: a) <b>Chemistry of Macromolecules:</b> Classification, structure and biological significance of carbohydrates, proteins, lipids and nucleic acid. b) <b>Enzyme:</b> Introduction, classification, properties, co-enzyme and co-factors, Mechanism of enzyme immobilization techniques and its application in Pharmaceutical industries. (10 Hrs)
<b>Unit-II</b>	: <b>Metabolism:</b> a) <b>Carbohydrates:</b> Glycolysis, glycogenesis, glycogenolysis, TCA cycle, Pentose Phosphate Pathway and ED Pathway b) <b>Proteins:</b> Transamination, Deamination and Decarboxylation of amino acids, Urea cycle c) <b>Lipids:</b> Beta Oxidation of fatty acids with energetic ketosis, ketogenesis and ketolysis. (10 Hrs)
<b>Unit-III</b>	: a) <b>Biological Oxidation:</b> Introduction, component of electron transport chain, oxidative phosphorylation, respiratory inhibitors. b) <b>Hormones:</b> Definition, Endocrine Glands, classification of hormones, physiological role of hormones. (10 Hrs)
<b>Unit-IV</b>	: a) <b>Procarvotic cell structure:</b> Size, shape and arrangement, nucleic acid organisation, cell membrane, cell wall, endospores, nucleic acid. Components external to cell wall: capsules, pili and flagella. <b>Fungi:</b> Distinguish characteristics of fungi, Morphology, Fungi of Special interest: <i>Mucor</i> (Class Zygomycetes) <i>Rhizopus</i> (Class Zygomycetes), <i>Aspergillus&amp;Penicillium</i> (Class Deuteromycetes). <b>Viruses:</b> Generalcharacteristics, Food borne viruses and their significance (Hepatitis A & E viruses and Rotavirus) b) <b>Microscopy:</b> Refractive Index, Focal point, focal length, lens function, bending of light by a prism, Resolution, Numerical aperture. Different types of Microscopes (Compound, Dark Field, Phase contrast, Fluorescence and electron microscope) (10 Hrs)
<b>Unit-V</b>	: a) <b>Microbial Nutrition:</b> Major and minor bio-elements, their source and function in microorganism, growth factors. Nutritional classification of bacteria. b) <b>Culture Media:</b> Synthetic or defined media, Complex media, selective and differential media. Preparation of broth and solid media (Nutrient agar and potato dextrose agar)

		c) <b>Isolation of pure culture:</b> Enrichments method, spread plate, streak plate and pour plate techniques <b>(10 Hrs)</b>
<b>Unit-VI</b>	:	a) <b>Staining Techniques:</b> Stains and dyes, Monochrome staining, Gram's staining, negative staining, acid fast staining, wet mount (For fungi), hanging drop technique to observe motility of bacteria. b) <b>Microbial Growth:</b> the growth curve, phases of growth curve. The mathematics of microbial growth. Measurement of microbial growth (cell number and cell mass). Factors affecting microbial growth (pH, Temperature) c) <b>Principles and practices sterilization:</b> Introduction, sensitivity of micro-organisms (Thermotolerant/thermophilic/spore forming bacteria), Sterilization methods (Moist heat, dry heat, gaseous, radiation and filtration) <b>(10 Hrs)</b>
<b>Reference Books:</b>	:	1. Harper's Biochemistry by Harpe, H. A. 21 <sup>st</sup> Edition. 1988. Appleton and Lange Publishers, California, USA 2. Principles of Biochemistry by Lehninger, A. L., 1982, CBS Publishers, New Delhi, India 3. Principles of Biochemistry by Zubay, G. L. 1995. W. C. Brown Publisher 4. Biochemistry by Stryer, L. 1988. Freeman & Co. 5. General Biochemistry by J. H. Weil. Wiley Eastern Ltd, New Delhi, India. 6. Microbiology by Nester, E.W.C.E. Roberts and M. T. Nester, Brown Publisher. 7. General Microbiology by R. Y. Stanier, E. A. Adelberg and J. L. Ingram 4 <sup>th</sup> Edition. Mac Millan Publications. 8. Microbiology by Prescott, Harley, Klein (2 <sup>nd</sup> Edition, W. C. Brown Publishers) 9. General Microbiology Vol I & II by Powar and Dagainawala 10. Fundamental Principles of bacteriology by A. J. Salle 11. Experiments in Microbiology, Plant pathology, Tissue Culture and Mushroom cultivation, 2 <sup>nd</sup> Edition, 1996, by K. R. Aneja, New Age International (P) Ltd, New Delhi, India. 12. Laboratory Methods by Harrigan W. E.

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**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II	
Code No. BED-155    Title: Basic Mechanical Engineering	
<b>Teaching Scheme:</b> Theory: 3 hours/week Tutorial: 1 hours/week Credits: 4	<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 hours</b> <b>Theory Examination (Marks): 80 Marks</b>
<b>Objectives</b>	: <ul style="list-style-type: none"> <li>• Introduction of Mechanical Engineering to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of Mechanical Engineering such as Power, Design and Production.</li> <li>• To give understanding of the various devices, machines and processes used in day to day life.</li> </ul>
<b>Unit-I</b>	: <b>Fundamental concepts and Definitions:</b> Scope of thermodynamics, brief idea about various fields of applications. Macroscopic & microscopic description of matter, pure substance, working substance, thermodynamic system & its types, thermodynamic state of system, thermodynamic properties, reversible and non-reversible process, cyclic and non-cyclic processes, thermodynamic equilibrium, Zeroth law of thermodynamics. Concept and measurement of temperature, temperature scales, pressure measuring devices.(Numerical treatment on pressure and temperature measurement).  (08 Hrs)
<b>Unit-II</b>	: <b>Work and Heat :</b> Thermodynamic definition of work, types of work, quasi static process, Pdv work for different processes, Definition of heat, specific heat, modes of heat transfer, laws governing the modes of heat transfer, comparison between heat & work (numerical on types of works). <b>First Law of Thermodynamics :</b> Statement of First law of thermodynamics, verification of first law by Jules experiment, PMM1, First law for cyclic and non cyclic ( Non flow ) processes, Concept of internal energy , enthalpy. Application of first law in various processes. (Numerical on single process only.)  (12 Hrs)
<b>Unit-III</b>	: <b>Thermal Machines:</b> Boiler: classification, construction and working of boiler (Lancashire, Benson only), boiler mountings and accessories location and applications only. Turbines: Classification, working principle of steam turbine-impulse and reaction type, Gas turbine- open cycle and closed cycle. Internal Combustion Engines: Classification, Construction parts, Working 4/2-stroke Petrol and diesel engines. P-V diagram. Refrigeration and Air conditioning, Definitions Refrigeration, Refrigerating effect, COP, Unit of Refrigeration TOR. Principle and working of vapor compression refrigeration. Principle and working of air conditioner and air cooler.  (10 Hrs)
<b>Unit-IV</b>	: <b>Introduction to Engineering Materials:</b> Introduction, Classification, Properties, Selection and application of materials .Basic heat treatment Processes: Annealing, Normalizing and Hardening. <b>Metal forming and Metal Joining Processes :</b> Hot working and cold working process, its advantage and disadvantages, Brief explanation of operations rolling,

		forging, extrusion and Wire drawing and its type .Introduction and classification of welding , brief description of Arc Welding and Oxy-Acetylene welding and its application. Soldering and Brazing processes.																																				
<b>Unit-V</b>	:	<b>Machine Tools:</b> Introduction and classification of machine tools, working principle block diagram and operations carried on Lathe machine, Drilling machine, Milling and Shaping machines. Specification of above machines. <span style="float: right;">(12 Hrs)</span>																																				
<b>Unit-VI</b>	:	<b>Power Transmission Elements:</b> Belt: Types of belt and its material, Belt Drives- types and application, velocity ratio, creep and slip in belt. Pulleys: Idler pulley stepped pulley, fast and loose pulley. Gears: Definition, Terminology, types and uses. Gear drives. Bearings- types and application Keys and Coupling: Types of keys, coupling types, rigid flange and bushed pin flexible coupling. Clutch: Types, description of single plate clutch. <span style="float: right;">(08 Hrs)</span>																																				
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1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> <b>(Faculty of Engineering &amp; Technology)</b> <b>Syllabus of F. Y. B. Tech. (Chemical) Semester-II</b>	
<b>Code No. BSH-191 Title: Environment &amp; Ecology</b>	
<b>Teaching Scheme:</b> <b>Theory: 2 hours/week</b> <b>Credits: 2</b>	<b>Class Test: 10 Marks</b> <b>Theory Examination (Duration): 2 hours</b> <b>Theory Examination (Marks): 40 Marks</b>
<b>Objectives</b>	: 1. As we aware, the world environmental problems, students should acquaint basic knowledge of environment and its components. 2. To solve the environmental problems, it is necessary to develop and invent new advanced technologies to control environmental pollution.
<b>Unit-I</b>	: <b>General Introduction &amp; Ecology:</b> Introduction, components of environment, factors affecting on environment, environmental degradation, concepts of ecology, structure and functions of ecosystem, principles of environmental impact assessment. 5 hrs
<b>Unit-II</b>	: <b>Air Pollution:</b> composition of atmosphere, sources and effects of pollutants, primary and secondary pollutants, Global warming, ozone depletion, acid rain, standards and control measures 5 hrs
<b>Unit-III</b>	: <b>Water Pollution:</b> Sources and effects of water pollution on environment, treatment and recycling of industrial effluent and municipal sewage. 5 hrs
<b>Unit-IV</b>	: <b>Land Pollution:</b> Lithosphere pollutants, their origin and effects, collection and disposal of solid waste 5 hrs
<b>Unit-V</b>	: <b>Municipal and Hazardous Waste:</b> Sources & effects of Municipal and Hazardous Waste, handling, storage and disposal methods of Municipal and Hazardous Waste, recovery and conversion methods, recycling of plastic and metal waste. 5 hrs
<b>Unit-VI</b>	: <b>Noise Pollution:</b> Sources of noise, its effects & control measures. 5 hrs
<b>Reference Books:</b>	: 1. Environmental Biology- P. D. Sharma. 2. Environmental Science- Nebel B. J. 3. Environmental Chemistry- A. K. Dey 4. Air Pollution- M. N. Rao 5. Water supply & Sanitary Engineering- R. C. Rangwala 6. Hazardous Waste Management- 2 <sup>nd</sup> Edition- Michael D. LaGrega, Phillip L. Buckingham, Jeffery C. Evans and Environmental Research Managements Mcgraw Hill International Edition, New York

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**For 40 marks Paper:**

1. Minimum eight questions
2. Four questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-II																								
<b>Code No.</b> BSH-171		<b>Title:</b> Lab VI-Physic																						
<b>Teaching Scheme:</b>		<b>Teachers Assessment:</b> 50 Marks																						
<b>Practical/Term Work:</b> 2 hours/week		<b>Credits:</b> 1																						
<b>Course Objectives</b>	:	1. Introduction of Physics in the curriculum intends to study physical properties of material and basic facts, concepts, law, principles of scientific investigation of physical quantities required in engineering. 2. Physics is the base of all engineering branches hence knowledge of various segments of physics is must for all engineers. 3. To accurately learn to relate the engineering applications with physics																						
<b>List of Practicals (Not Less than 10)</b>	:	1. $e/m$ by Thomson's method 2. Newton's rings –determination of $\lambda$ 3. Diffraction grating-determination of $\lambda$ 4. Resolving power of telescope 5. Laurent's half shade colorimeter 6. Logic gates (AND,NAND,OR,NOR) study 7. Study of L.D.R. (light dependent register) 8. R-S Flip flop 9. P-N junction diode characteristics 10. Zener diode characteristics 11. Transistor characteristics 12. Determination of $\lambda$ Laser by diffraction grating																						
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The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
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<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I	
<b>Code No. BSH-172</b>	<b>Title: Lab III- Organic Chemistry-II</b>
<b>Teaching Scheme:</b>	
<b>Practical/Term Work: 2 hours/week</b>	<b>Teachers Assessment: 50 Marks</b>
<b>Credits: 1</b>	
<b>Course Objectives</b>	: Student should understand synthesis of drugs and its pharmaceutical importance.
<b>List of Practicals (Not Less than 10)</b>	: <ol style="list-style-type: none"> <li>1 Organic separation and organic qualitative analysis: To separate two compounds from the given binary mixture qualitatively and identify one of the components from them. Prepare the derivative of same. (Minimum 08 water insoluble binary mixture)</li> <li>2 Organic preparations.               <ol style="list-style-type: none"> <li>a) Preparation of Benzanilide from Aniline.</li> <li>b) Preparation of 2-Naphthaline benzoate from <math>\beta</math>-Naphthol.</li> <li>c) Preparation of P-Bromo acetanilide from Acetanilide.</li> <li>d) Preparation of P-Nitro acetanilide from Acetanilide.</li> <li>e) Preparation of Pthalimide from Pthalic anhydride.</li> <li>f) Preparation of Aspirin.</li> </ol> </li> </ol>
<b>List of Reference Books</b>	: Qualitative organic analysis by I. Vogel Practical organic chemistry by I. Vogel

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I																							
<b>Code No. SCD-173</b>		<b>Title: Lab IX- Basic Mechanical Engineering</b>																					
<b>Teaching Scheme:</b>		<b>Teachers Assessment: 50 Marks</b>																					
<b>Practical/Term Work: 2 hours/week</b>		<b>Credits: 1</b>																					
<b>Course Objectives</b>	:	<ul style="list-style-type: none"> <li>• Introduction of Mechanical Engineering to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of Mechanical Engineering such as Power, Design and Production.</li> <li>• To give understanding of the various devices, machines and processes used in day to day life.</li> </ul>																					
<b>List of Practicals (Not Less than 10)</b>	:	Term work shall consist of a record book on laboratory experiments studies on the following:																					
		SN	Particulars																				
		1	Study and demonstration Low Pressure Boiler(any one)																				
		2	Study and demonstration High Pressure Boiler(any one)																				
		3	Study and demonstration Steam Turbine																				
		4	Study and demonstration Refrigerator																				
		5	Study and demonstration Air Conditioner																				
		6	Study and demonstration Air Cooler.																				
		7	Study and demonstration Lathe Machine																				
		8	Study and demonstration Shaper Machine																				
		9	Study and demonstration Milling machine																				
		10	Study and demonstration of Gears																				
		11	Assignment on topic 1,2,3,4																				
<b>List of Reference Books</b>	:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">SN</th> <th style="text-align: center;">Title</th> <th style="text-align: center;">Author</th> <th style="text-align: center;">Publication</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Fundamentals of classical</td> <td>P.K. Nag</td> <td>Tata Mc Graw Hill</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Thermal Engineering</td> <td>R.K. Rajput</td> <td>Laxmi Publication</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Thermal Engineering</td> <td>P.L. Ballany</td> <td>Khanna Publication</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Thermodynamics</td> <td>C.P. Arora</td> <td>Tata Mc Graw Hill</td> </tr> </tbody> </table>		SN	Title	Author	Publication	1	Fundamentals of classical	P.K. Nag	Tata Mc Graw Hill	2	Thermal Engineering	R.K. Rajput	Laxmi Publication	3	Thermal Engineering	P.L. Ballany	Khanna Publication	4	Thermodynamics	C.P. Arora	Tata Mc Graw Hill
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<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I						
<b>Code No.</b> SCD-174	<b>Title:</b> Lab X- Workshop Practice					
<b>Teaching Scheme:</b>	<b>Teachers Assessment:</b> 50 Marks					
<b>Practical/Term Work:</b> 2 hours/week	<b>Credits:</b> 1					
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>To have hands on practice for Mechanical Workshop.</li> </ul>					
<b>List of Practicals (Not Less than 10)</b>	<b>Mechanical</b>					
	<b>Section</b>					
	<b>Contents</b>					
	<table border="1"> <tbody> <tr> <td style="width: 20%;">Fitting</td> <td>           Study of different tools of fitting &amp; processes involved in fitting.            Workshop Diary – Sketches &amp; description of fitting tools, Sketches of the job.            Practical: One composite job involving simple fitting operation like sawing, marking, filling &amp; tapping operation: minimum one job (Male – female fitting)         </td> </tr> <tr> <td>Black Smithy</td> <td>           Study of different smithy tools &amp; processes.            Workshop diary - Sketches &amp; description of smithy tools, Sketches of the job.            Practical: Preparation of one job making round cross section to square bar.         </td> </tr> <tr> <td>Sheet Metal Working</td> <td>           Study of different sheet metal tools.            Workshop diary - Sketches &amp; description of sheet tools.            Sketches of the job.            Practical: one job involving development of surfaces, marking on sheet metal cutting, bending, joint preparation by folding.         </td> </tr> </tbody> </table>	Fitting	Study of different tools of fitting & processes involved in fitting. Workshop Diary – Sketches & description of fitting tools, Sketches of the job. Practical: One composite job involving simple fitting operation like sawing, marking, filling & tapping operation: minimum one job (Male – female fitting)	Black Smithy	Study of different smithy tools & processes. Workshop diary - Sketches & description of smithy tools, Sketches of the job. Practical: Preparation of one job making round cross section to square bar.	Sheet Metal Working
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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. (Chemical) Semester-I																													
Code No. SCD-192		Title: Lab V- Development of Skills-II																											
Teaching Scheme:		Teachers Assessment: 50 Marks																											
Practical/Term Work: 2 hours/week		Credits: 1																											
Course Objectives	:	1.To help the engineering students acquire adequate mastery of communicative English language primarily - reading and writing skills. 2.To provide language training to the students to enable them to understand and acquire knowledge in technical subjects. 3.To help the students cultivate habit of reading. 4.To help the students write effectively to get desired results.																											
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	1	English Grammar Composition & Effective Business Communication	M. A. Pink, S. E. Thomas	5th Edition Chand Company Ltd.
	2	Living English Structure	W. Stannard Allen	Orient Longman
	3	Effective Teaching- A measure of Excellence	Mathew Thomas	Chand & Company
	4	Any day English for Effective Communication	Henry Van Dyke, Mortha Prabhakar Rao	English Edition
	5	Written Communication in English	Sarah Freeman	Orient Longman
	6	A University Grammar of English	Randolph Quirk Sidney Green Baum	Pearson Education
	7	Modern Commercial Correspondence	R. S. N. Pillai	Chand & Company Ltd.
	8	Technical Writing and Professional Communication	T.Huckins	McGraw Hill Publication
	9	Technical Communication	Farathullah	
	10	Excellence in Business Communication	J H V Thill, Cortland L. Bovee	Macmillan Publication
	11	Effective Technical Communication'	M Ashraf Rizvi	Tata McGraw Hill
	12	Basic Managerial Skills for all	E. H. McGrath	Eastern Economy Edition, Prentice Hall India.
	13	Developing Communication Skills'	Skills' Krishna Mohan, Meera Bannerii	McMillan India Ltd
	14 4	The structure of Technical English	Herbert. A. J	Orient Longman
	15	A Remedial English Grammar for Foreign Students	F.T. Wood	Macmillan Publication
16	Business Communication Strategy and Skill	Munter, Mary	Prentice Hall Inc., New Jersey	

	17	Business Writing and Communication	Kenneth W. Davis	TMGH Publication
	18	Technical Report Writing Today	Daniel G. Riordan, Steven E. Pauley	Indian Adaptation, Biztantra Publication
	19	Basic business communication	Raymond V.Lesikar	
	20	Effective Business Communication	Asha Kaul	Prentice-Hall India Pvt. Ltd
	21	Technical Writing	B. N. Basu	Prentice-Hall India Pvt. Ltd.
	22	Business Communication Strategies	Matthukutty M. Monippally	TMGH Publication

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**PROPOSED**  
**SCHEME AND DETAILED SYLLABUS**  
**Of**  
**F. Y. B. Tech.**  
**OF**  
**FOUR YEAR DEGREE COURSE IN ENGINEERING & TECHNOLOGY**



**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,**  
**AURANGABAD**

**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**Proposed Revised Structure**  
**[First Year common to all branches]**

Sub No.	SEMESTER-I	Contact Hrs / Week				Examination Scheme						
	Subject	L	T	P	Total	CT	ESE	T A	P	Total	Credits	Duration of Theory Exam
BSH101	Engineering Mathematics-I	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH102/ BSH103	Engineering Physics/ Engineering Chemistry	3	1	-	4	20	80	-	-	100	4	3 Hrs
EED104	Basic Electrical Engineering	3	1	-	4	20	80	-	-	100	4	3 Hrs
MED105	Engineering Drawing	3	1	-	4	20	80	-	-	100	4	4 Hrs
CSE106	Computer Fundamental & Programming	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED107	Basic Civil Engineering	2	-	-	2	10	40	-	-	50	2	2 Hrs
BSH121/ BSH122	Lab I/Lab II Engineering Physics/ Engineering Chemistry	-	-	2	2	-	-	50	-	50	1	
EED123	Lab III Basic Electrical Engineering	-	-	2	2	-	-	50	-	50	1	
MED124	Lab IV Engineering Drawing	-	-	2	2	-	-	50	-	50	1	
CSE125	Lab V Computer Fundamental & Programming	-	-	2	2	-	-	50	-	50	1	
MED126	Lab VI Workshop Practice I	-	-	2	2	-	-	50	-	50	1	
	<b>Total of semester-I</b>	<b>17</b>	<b>5</b>	<b>10</b>	<b>32</b>	<b>110</b>	<b>440</b>	<b>250</b>	<b>-</b>	<b>800</b>	<b>27</b>	
Sub No.	SEMESTER-II	Contact Hrs / Week				Examination Scheme						
	Subject	L	T	P	Total	CT	ESE	T A	P	Total	Credits	Duration of Theory Exam
BSH151	Engineering Mathematics-II	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH103/ BSH102	Engineering Chemistry / Engineering Physics	3	1	-	4	20	80	-	-	100	4	3 Hrs
ECE152	Basic Electronics	3	1	-	4	20	80	-	-	100	4	3 Hrs
CED153	Engineering Mechanics	3	1	-	4	20	80	-	-	100	4	3 Hrs
MED154	Basic Mechanical Engineering	3	1	-	4	20	80	-	-	100	4	3 Hrs
BSH155	Environment & Ecology	2	-	-	2	10	40	-	-	50	2	2 Hrs
BSH122/ BSH121	Lab II/Lab I Engineering Chemistry / Engineering Physics	-	-	2	2	-	-	50	-	50	1	
ECE171	Lab VII Basic Electronics	-	-	2	2	-	-	50	-	50	1	
CED172	Lab VIII Engineering Mechanics	-	-	2	2	-	-	50	-	50	1	
MED173	Lab IX Basic Mechanical Engineering	-	-	2	2	-	-	50	-	50	1	
BSH174	Lab X Development of Skills-I	-	-	2	2	-	-	50	-	50	1	
	<b>Total</b>	<b>17</b>	<b>5</b>	<b>10</b>	<b>32</b>	<b>110</b>	<b>440</b>	<b>250</b>	<b>-</b>	<b>800</b>	<b>27</b>	
	<b>Grand Total of I &amp; II</b>									<b>1600</b>	<b>54</b>	

L: Lecture hours per week    T: Tutorial hours per week    P: Practical hours per week    CT: Class Test  
ESE: End Semester Examination    TA: Teachers Assessment    P: Practical/Oral Examination

<p style="text-align: center;"><b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering &amp; Technology) Syllabus of F. Y. B. Tech. Semester-I</p>						
<p><b>Code No.: BSH101</b> <b>Title: Engineering Mathematics-I</b> <b>Teaching Scheme:</b> <b>Theory: 3 hrs/week</b> <b>Tutorial: 1 hr/week</b> <b>Credits: 4</b></p> <p style="text-align: right;"><b>Class Test: 20 marks.</b> <b>Theory Examination (Duration): 3 Hrs.</b> <b>Theory Examination (Marks): 80 Marks.</b></p>						
<b>Objectives</b>	:	<p>1) To develop Logical understanding of the subject. 2) To develop mathematical skills so that students are able to apply mathematical methods and principles in solving problems from different engineering fields. 3) To inculcate computational skills.</p>				
<b>Unit-I</b>	:	<p>Matrix:- Rank of matrix, canonical form of matrix, normal form of matrix, solution of simultaneous linear equations (homogeneous &amp; non homogenous), linear dependence &amp; independence of the vectors, Caley-Hamilton theorem, Application of matrices (Rotation ,Alternate to Gauss Elimination)</p> <p style="text-align: right;"><b>(10 Hrs)</b></p>				
<b>Unit-II</b>	:	<p>Infinite series:- Introduction to infinite sequences &amp; infinite series, Test of convergence &amp; divergence of infinite series: nth term test, integral test, p-series, comparison test, ratio test, nth root test, Rabbe's test, logarithmic test (All test without proof) ,Absolute and Conditional Convergence.</p> <p style="text-align: right;"><b>(10 Hrs)</b></p>				
<b>Unit-III</b>	:	<p>Successive Differentiation:- Nth derivative of some standard functions, Leibnitz's theorem Taylor's and Maclaurin's Theorem, Expansion of function in power series(standard series). Evaluation of standard series. Indeterminate form,L'Hospital's Rule and It's Application (for Indeterminate Form)</p> <p style="text-align: right;"><b>(10 Hrs)</b></p>				
<b>Unit-IV</b>	:	<p>Complex Number: Introduction to complex number, De-Moivrer's theorem, root of complex number, circular function &amp; hyperbolic function, relation between circular &amp; hyperbolic function, inverse hyperbolic functions, separation of real &amp; imaginary parts, logarithm of complex quantity.</p> <p style="text-align: right;"><b>(15 Hrs)</b></p>				
<b>Unit-V</b>	:	<p>Partial Differentiation: Partial derivatives, Total Derivatives, Euler's theorem on Homogeneous function, Implicit Function ,Change of independent variables</p> <p style="text-align: right;"><b>(10 Hrs)</b></p>				
<b>Unit-VI</b>	:	<p>Maxima and Minima : Maxima and Minima of two independent variables, Jacobians and Their Applications</p> <p style="text-align: right;"><b>(05 Hrs)</b></p>				
<b>Reference Books:</b>	:	<b>Sr. No.</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>	<b>Edition</b>
		1	A Text Book Of Applied Mathematics Volume-I	P.N. Wartikar J.N. Wartikar.	Pune Vidyaryhi Griha Prakashan	Ninth edition
		2	Advanced Engineering Mathematics	H.K.Dass.	S.Chand And Co.Ltd	Eighteenth edition
		3	Higher Engineering Mathematics	Dr.B.S.Grewal	Khanna Publishers	46th edition
		4	Higher Engineering Mathematics	B.V.Ramana	Tata McGraw-Hill Publishing Co.Ltd.	First edition

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I/II			
<b>Code No.: BSH102</b>			
<b>Title: : Engineering Physics</b>			
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <b>Teaching Scheme:</b>  <b>Theory : 3 hrs/week</b>  <b>Tutorial : 1 hr/week</b>  <b>Credits : 4</b> </td> <td style="width: 50%; border: none;"> <b>Class Test: 20 Marks.</b>  <b>Theory Examination (Duration) : 3 Hrs.</b>  <b>Theory Examination (Marks): 80 Marks.</b> </td> </tr> </table>		<b>Teaching Scheme:</b> <b>Theory : 3 hrs/week</b> <b>Tutorial : 1 hr/week</b> <b>Credits : 4</b>	<b>Class Test: 20 Marks.</b> <b>Theory Examination (Duration) : 3 Hrs.</b> <b>Theory Examination (Marks): 80 Marks.</b>
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<b>Objectives</b>	: 1. Introduction of Physics in the curriculum intends to study physical properties of material and basic facts, concepts, law, principles of scientific investigation of physical quantities required in engineering. 2. Physics is the base of all engineering branches hence knowledge of various segments of physics is must for all engineers. 3. To accurately learn to relate the engineering applications with physics		
<b>Unit-I</b>	: <b>OPTICS INTERFERENCE:</b> Interference in thin film, phase reversal, Newton's ring in reflected light, application-wavelength determination, refractive index, optical flatness.  <b>DIFFRACTION:</b> diffraction of light, Fresnel and Fraunhofer diffraction (only definition) diffraction grating, grating theory.  <b>POLARISATION:</b> Polarization, Double refraction, Nicol prism, polarimeter, optical activity and specific rotation, Laurents half shade polarimeter.  <b>LASER:</b> Properties of laser ,absorption, spontaneous & stimulated emission , meta stable state ,population inversion ,active medium ,pumping ,resonant cavity ,ruby laser ,He-Ne laser, application construction.  <b>(Descriptive and Analytical) (12 Hrs)</b>		
<b>Unit-II</b>	: <b>SUPERCONDUCTIVITY:</b> phenomenon, zero electrical resistivity, effect of temperature and magnetic fields, Messiner effect, Silsbee rule, type I & II ,critical temperature ,critical field superconductors, applications. <b>ACOUSTICS AND ULTRASONICS:</b> Reverberation and reverberation time, absorption coefficient, Sabine's formula (derivation not necessary) acoustical design of hall.  <b>Ultrasonic :</b> properties ,piezoelectric transducer ,magnetostriction transducer ,applications.  <b>(Descriptive and Analytical) (12 Hrs)</b>		
<b>Unit-III</b>	: <b>X-RAYS AND CRYSTAL STRUCTURE :</b>  Crystalline & Amorphous material, periodicity in crystal, geometry of space lattice, unit cell, Crystal symmetry, Miller indices.  X- Rays: Continuous & characteristics spectra, Bragg's law, Bragg's spectrometer, powder crystal method.  <b>(06 Hrs)</b>		
<b>Unit-IV</b>	: <b>NUCLEAR PHYSICS:</b> Nuclear fission and fusion ,chain reaction ,controlled and uncontrolled chain reaction ,multiplication factor ,nuclear reactor ,P-P cycle ,C-N cycle, Accelerators-cyclotron , betatron.  <b>MODERN PHYSICS :</b> Wave particle duality , De- Broglie concept of matter wave, matter wave & their		

		properties. Davission –Germer experiment .Heisenberg uncertainty principle, Schrodinger time independent equation & its application to a particle in a box. <b>(Descriptive and Analytical) (10 Hrs)</b>				
<b>Unit-V</b>	:	<b>DIELECTRICS :</b> Introduction, Dielectrics parameters-(dielectric strength, dielectric constant) Types of Polarization-(electronic, ionic, & orientation Polarization.), Effect of temperature & frequency on Polarization , dielectric breakdown <b>MAGNETIC MATERIALS:</b> Ferrites, soft & hard magnetic materials & their application. <b>SEMICONDUCTORS, NANOTECHNOLOGY :</b> Semiconductors, Diode & zener diode their characteristics, transistor & its action, Hall effect, Hall Coefficient. <b>Nanotechnology :</b> Introduction to nanotechnology& applications <b>(10 Hrs)</b>				
<b>Unit-VI</b>	:	<b>FIBER TECHNOLOGY:</b> propagation of light through optical fiber, acceptance angle and cone numerical aperture, types .optical fiber communication system ,applications. <b>ELECTRON OPTICS :</b> Electron refraction – Bethe’s law, electron gun , cathode ray tube (CRT – Construction & working), electron microscope (Construction , working & application.), determination of e/m Thomson’s method, positive rays production & properties, Bainbridge mass spectrograph <b>(10 Hrs)</b>				
<b>Reference Books:</b>	:	Sr. No	Title	Author	Publication	Edition
		1	A Text book of Engineering Physics	Avdhanun Kshirsagar	S. Chand & Co.	7 <sup>th</sup>
		2	A Text book of Engineering Physics	Gaur & Gupta	Dhanpatrai & Sons	3 <sup>rd</sup>
		3	Material Science	V. Raghavan	Prientice Hall of India	3 <sup>rd</sup>
		4	Electrical Engineering Material	A.J. Dekkar	Prientice Hall of India	4 <sup>th</sup>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I	
<b>Code No EED 104</b>	
<b>Title: Basic Electrical Engineering</b>	
<b>Teaching Scheme:</b> Theory : 3 hrs/week Tutorial : 1 hr/week Credits : 4	
<b>Class Test : 20 Marks.</b> <b>Theory Examination (Duration) : 03 Hrs</b> <b>Theory Examination (Marks) : 80 Marks.</b>	
<b>Objectives</b>	: At the end of the semester student should be able to know the fundamentals of Electrical Engineering concepts in Theory & In practical he should made aware about methods of practices & safety.
<b>Unit-I</b>	: General Concept of EMF,P.D. &Current. - Definitions of R,L,C- Resistance for Metal ,Alloys. Insulators. Factors upon which resistance depends.-Specific resistance- Resistivity-conductance-Effect of temperature on resistance. temperature coefficient (alpha). Temperature co-efficient at different temperatures-Summary y of temperature co-efficient relations- SI Units of Work ,power & Energy .Insulation resistance of cable. (Descriptive & Analytical) (06 Hrs)
<b>Unit-II</b>	: D.C.Circuit- Ohm's Law,Kirchoff's Laws. Constant &Ideal voltage & Current sources –Internal resistance-Simplification of Networks using series & parallel combinations , Star Delta conversions, Theorems – Nodal, loop analysis ,Superposition, Thevenins , Maximum power transfer Theorem. (Descriptive & Analytical) (12 Hrs)
<b>Unit-III</b>	: Electromagnetism- Magnetic Effect of an Electric Current. Cross & Dot Conventions, Right Hand Thumb Rule, Cork's Screw Rule, Nature of Magnetic field of Long Straight Conductor, Solenoid & Toroid. Concept of MMF, Flux, Flux Density, Reluctance, Permeability & Field Strength. Their units & Relationships. Simple series & Parallel Magnetic circuits. Comparison of Electrical & Magnetic Cuircuits.Force on current carrying conductor placed in Magnetic field. Fleming's Left Hand Rule.Faraday.s laws of Electromagnetic Induction. Statically & Dynamimically induced EMF. Self & Mutual Inductance. Co-efficient of coupling. Energy stored in magnetic field. Decay & rise in R-L Circuit. Time constant-Descriptive treatment on B-H Curve. Hysteresis loop,Hystersis Hlosses,Eddy current, eddy current losses. Reduction in Hysteresis & eddy current losses. (Descriptive & Analytical) (12 Hrs)
<b>Unit-IV</b>	: Electrostatics - Electrostatic field, Electric flux Density, Electric Field Strength, Absolute permittivity, Relative Permittivity,,Capacitance & Capacitor,Compsite Dielectric Capacitors, Capacitors in Series & Parallal,Energy stored in capacitors ,Charging & Discharging of capacitor & Time Constant. factor,reactance,impedence,apperant power active power ,reactive power, power factor, series & parallel circuit. Solution of circuits by impedance / admittance-notation method.Phasor diagram using RL & C - (Descriptive & Analytical) (08 Hrs)
<b>Unit-V</b>	: AC Fundamentals- Sinusoidal voltages & Currents. Their mathematical & Graphical Representation. (Descriptive & Analytical) (08 Hrs)

		Concept of Instantaneous, Peak (Maximum), Average & RMS Values, Frequency, Cycle, Period, Peak Factor & Form factor, Phase difference, Lagging, Leading & in phase quantities & phaser representation For Pure R, Pure L, Pure C. Development of concept of Reactatance, Admittance, Impedence, Conductance, Susceptance, Rectangular & polar representation of phasers. Series & Parallel Resonance circuits-, Q-Factor. concept active power, reactive power, Total power, power factor (Descriptive & Analytical) (14 Hrs)
<b>Unit-VI</b>	:	Single Phase Transformer- Principle of working, construction & types of transformer, core type & shell Type, EMF equation, ideal & practical transformer on no load, on load. Regulation & efficiency of transformer by direct loading. Descriptive treatment of autotransformers and dimmerstats (Descriptive & Analytical) (08 Hrs)
<b>Reference Books:</b>	:	1) Electrical Technology- Vol-I&II B.L.Theraja 2) Basic Electrical Engineering J.B.Gupta 3) Basic Electrical Engineering V.N.Thatte 4) Basic Electrical Engineering V.N.Mittal

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

- 1) Minimum ten questions
- 2) Five questions in each section
- 3) Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no. 1 and 6 should be of objective nature.
- 4) Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I					
<b>Code No.: MED105</b>					
<b>Title : Engineering Drawing</b>					
<b>Teaching Scheme:</b>					
<b>Theory : 3 hrs/week</b>		<b>Class Test : 20 Marks</b>			
<b>Tutorial : 1 hr/week</b>		<b>Theory Examination (Duration) : 4 Hrs.</b>			
<b>Credits : 4.</b>		<b>Theory Examination (Marks) : 80 Marks.</b>			
<b>Objectives</b>	:	The objective of learning this subject at undergraduate level is to develop vision, imagination and presentation skill required for drawing and presentation of various engineering components in 2-D and 3-D by using first angle method of projections only except for projections of straight lines.			
<b>Unit-I</b>	:	PROJECTIONS OF STRAIGHT LINES –line inclined to one plane, line inclined to both the reference planes and in different quadrants, traces of a line. (Graphical) (10 Hrs)			
<b>Unit-II</b>	:	PROJECTIONS OF PLANES –Planes with surface inclined to both the planes. Planes such as- triangles, squares, rectangles, quadrilaterals, pentagon, hexagon, circle, semicircle. (Graphical) (09 Hrs)			
<b>Unit-III</b>	:	PROJECTIONS OF SOLIDS –Projections of solids such as prism, cylinder, pyramid, cone, sphere, frustum, cube tetrahedron, with axis inclined to one or both the reference planes. (Graphical) (11 Hrs)			
<b>Unit-IV</b>	:	SECTIONS OF SOLIDS –Projections of regular solids such as prism, cylinder, pyramid, cone, cube, tetrahedron, cut by cutting planes inclined to one plane. Determination of cutting plane angle from the given true shape of the section. DEVELOPMENT OF SURFACES – Development of surfaces of various regular solids, development of surfaces of cut solids such as prism, cylinder, pyramid and cone. (Graphical) (12 Hrs)			
<b>Unit-V</b>	:	ORTHOGRAPHIC PROJECTIONS: - Obtaining orthographic projections of different machine parts from the given 3D view, sectional orthographic projections. (Graphical) (10 Hrs)			
<b>Unit-VI</b>	:	ISOMETRIC PROJECTIONS: - Introduction to isometric projections and isometric views, isometric and nonisometric lines. Drawing Isometric views of simple machine parts. (Graphical) (08 Hrs)			
<b>Reference Books:</b>	:	Sr no.	Title	Author	Publication
		1	Elementary Engineering Drawing	N D Bhatt	Charotar Publication House
		2	A Text Book of engineering Graphics	M L Dhabhade	Association of Technical Authors, Pune
		3	Engineering Drawing	Mali & Chaudhary	Vrinda Publishers
		4	Engineering Drawing	Basant Agrawal C. M. Agrawal	Tata McGraw-Hill Education, 2008

Section A: Includes Unit I, II and III; Section B: Includes Unit IV, V and VI.

### PATTERN OF QUESTION PAPER

(Note: The theory paper of EG will include the detailed syllabus covered in EG Theory and Practicals)

#### SECTION A

1. Question no. 1. Projections of Straight Lines inclined to both the reference planes, for 13 marks
2. Question no. 2. Projections of line for 13 marks.
3. Question no. 3. Projections of planes for 13 marks.
4. Question no. 4. Projections of solids for 14marks.
5. Question no. 5. Section of the solids for 13 marks.

**SECTION B**

6. Question no. 6. Development of surfaces 13 marks
7. Question no. 7. Conversion of Isometric views into Orthographic Projections for 14 marks.
8. Question no. 8. Missing Views for 13 marks
9. Question no. 9. Conversion of Orthographic Projections into Isometric views for 13 marks.
10. Question no. 10. Free hand sketches from chapter Machine Parts, for 13 marks.

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
(Faculty of Engineering & Technology)  
Syllabus of F. Y. B. Tech. Semester-I.

Code No. : CSE 106

**Title : Computer Fundamentals and Programming****Teaching Scheme:****Theory : 3 hrs/week****Tutorial : 1 hr/week****Credits : 4****Class Test: 20 Marks****Theory Examination (Duration): 3 Hrs****Theory Examination (Marks): 80 Marks**

<b>Objectives</b>	: 1. To be conversant with the fundamentals of computers. 2. To develop programming skills in 'C' language.																									
<b>Unit-I</b>	: <b>Introduction</b> <b>Computers</b> -What is a computer, Evolution of computers, Types of computers, computer hardware, computer software & its types. <b>Programming Languages</b> - Generations of Programming languages, Five phases of system development life cycle. <b>Algorithms and Flowcharts</b> - What is an algorithm, uses of algorithms, flowchart symbols. <b>(06 Hrs)</b>																									
<b>Unit-II</b>	: <b>Introduction to C</b> The C character set, constants, variables, keywords and operators, Basic data types, Instructions, Type conversion, The C program structure, Simple C program. <b>(10 Hrs)</b>																									
<b>Unit-III</b>	: <b>The Decision control structure</b> The if-statement, the if-else statement, use of logical operators, conditional operator.  The Decision control and loop Control structure The if-statement, the if-else statement, Loops- While, for and do-while loops, Break statement, Case control structure, Switch and goto statement. <b>The loop and case control structures</b> Loops- While, for and do-while loops, Break statement, continue statement, Switch and goto keyword The if-statement, the if-else statement, Loops- While, for and do-while loops, Break statement, Case control structure, Switch and goto statement. <b>(14 Hrs)</b>																									
<b>Unit-IV</b>	: <b>Arrays</b> Array initialization, Bounds checking, One Dimensional Array and Two Dimensional Array.  <b>Strings</b> What are Strings, Standard Library Functions -strlen(), strcpy(), strcat(), strcmp(), strrev(). <b>(09 Hrs)</b>																									
<b>Unit-V</b>	: <b>Functions and Pointers</b> What is a function-why to use functions, Passing values between functions-Scope, Rule of functions, Advanced features of functions-function declaration and Prototypes, Introduction to Pointers, Pointer notation, Recursion, Call by Value and Call by Reference, Passing Array Elements to a function. <b>(13 Hrs)</b>																									
<b>Unit-VI</b>	: <b>Structures</b> Why to use Structures-Declaring a Structure, Accessing Structure elements, How Structure elements are stored, Array of Structures, Additional features of Structures. <b>(08 Hrs)</b>																									
<b>Reference Books:</b>	: <table border="1"> <thead> <tr> <th>Sr.No</th> <th>Title</th> <th>Author</th> <th>Publication</th> <th>Edition</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Introduction to computers</td> <td>Peter Norton</td> <td>Tata McGrawHill</td> <td>Fourth edition</td> </tr> <tr> <td>2</td> <td>Let us C</td> <td>Yashawant Kanetkar</td> <td>BPB</td> <td>Eighth edition</td> </tr> <tr> <td>3</td> <td>Programming in C</td> <td>E. Balagurusamy</td> <td>Tata McGrawHill</td> <td>Fourth edition</td> </tr> <tr> <td>4</td> <td>Using Turbo C</td> <td>Herbert schildt</td> <td>PHI</td> <td>Fourth edition</td> </tr> </tbody> </table>	Sr.No	Title	Author	Publication	Edition	1	Introduction to computers	Peter Norton	Tata McGrawHill	Fourth edition	2	Let us C	Yashawant Kanetkar	BPB	Eighth edition	3	Programming in C	E. Balagurusamy	Tata McGrawHill	Fourth edition	4	Using Turbo C	Herbert schildt	PHI	Fourth edition
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**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

- 1) Minimum ten questions
- 2) Five questions in each section
- 3) Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4) Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<p align="center"><b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering &amp; Technology) Syllabus of F. Y. B. Tech. Semester-I.</p>		
<p><b>Code No.: CED 107</b> <b>Title: : Basic Civil Engineering.</b> <b>Teaching Scheme:</b> <b>Theory: 2 hrs/week</b> <b>Tutorial: –</b> <b>Credits: 2</b></p>		
<p align="right"><b>Class Test: 10 Marks</b> <b>Theory Examination (Duration): 2 Hrs</b> <b>Theory Examination (Marks): 40 Marks</b></p>		
<b>Objectives</b>	:	Create awareness and knowledge in students about basic civil engineering terminologies and techniques which will be helpful in their day to day life.
<b>Unit-I</b>	:	Civil Engineering Materials: Study of properties and use of civil engineering materials namely bricks, rubble, cement, sand, coarse aggregate. <b>(05 Hrs)</b>
<b>Unit-II</b>	:	Foundation : Introduction to foundation and types, isolated, footing, combined footings, cantilever footing. Pile foundation – types <b>(05 Hrs)</b>
<b>Unit-III</b>	:	Masonry : Introduction to brick masonry and bonds in brick, header bond, stretcher bond, English and Flemish bond. <b>(05 Hrs)</b>
<b>Unit-IV</b>	:	Lintels, Doors and windows : Types of lintels, definition of technical terms of doors and windows, study of battened, ledged and braced doors casement windows, glazed window, and metal windows. <b>(04 Hrs)</b>
<b>Unit-V</b>	:	Roofs and floors : Trussed roofs, king post roof truss and queen post roof truss, flat RCC roof, components of floor, material for construction of floor. <b>(05 Hrs)</b>
<b>Unit-VI</b>	:	Surveying & Leveling i) surveying: Length measurement use of metallic tape and chain (20m & 30m). ii) Angular Measurements : Use of prismatic compass, simple problems. iii) Level measurements : Use of dumpy level, simple problems on calculation of reduced levels <b>(06 Hrs)</b>
<b>Reference Books:</b>	:	1) Building Materials- Dr. K.A. Patil & I.K. Pateriya 2) Building Construction- B.C. Punmia 3) Building Construction- Sushil Kumar 4) Surveying & Leveling- B.C. Punmia

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 40 marks Paper:**

1. Minimum eight questions
2. Four questions in each section
3. Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for six marks each. The Question no.1 and 6 should be of objective nature.
4. Two questions of 7 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I/II						
<b>Code No.: BSH 121</b>						
<b>Title: Lab I/II: Engineering Physics</b>						
<b>Teaching Scheme: 2 Hrs</b>		<b>Teachers Assessment : 50 Marks</b>				
<b>Practical/Term Work: TW</b>		<b>Credits: 1</b>				
<b>Course Objectives</b>	:	1. Introduction of Physics in the curriculum intends to study physical properties of material and basic facts, concepts, law, principles of scientific investigation of physical quantities required in engineering. 2. Physics is the base of all engineering branches hence knowledge of various segments of physics is must for all engineers. 3. To accurately learn to relate the engineering applications with physics				
<b>List of Practicals (Minimum ten experiments to be performed)</b>	:	1.	Newton's ring: To determine radius of curvature of convex lens			
		2.	Refractive index of a liquid by Newton's ring: To determine refractive index of a liquid			
		3.	Optical flatness: To test the optical flatness			
		4.	Grating: To determine wavelength of light			
		5.	Polarimeter: To determine concentration of solution			
		6.	Laser: Study experiment on different lasers			
		7.	Ultrasonic's interferometer: To determine the velocity of ultrasonic waves			
		8.	Reverberation time: To determine reverberation time of a hall.			
		9.	Crystal structure from diffraction pattern: To determine crystal structure from diffraction pattern			
		10.	e/m by Thomson method: To determine e/m			
		11.	Elements of symmetry: To study different element of symmetry			
		12.	Diode Characteristics: To study characteristics diode			
		13.	Zener diode :To study characteristics of zener diode & to determine zener voltage			
		14.	Dielectric constant: to determine dielectric constant			
		15.	Forbidden gap: To determine forbidden gap of semiconductors			
		16.	Transistor Characteristics in CE Configuration.			
<b>List of Reference Books</b>	:	<b>Sr. No</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>	<b>Edition</b>
		1	A Text book of Engineering Physics	Avdhanun Kshirsagar	S. Chand & Co.	7 <sup>th</sup>
		2	A Text book of Engineering Physics	Gaur & Gupta	Dhanpatrai & Sons	3 <sup>rd</sup>
		3	Material Science	V. Raghavan	Prientice Hall of India	3 <sup>rd</sup>

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I													
<b>Code No. : EED123</b> <b>Title : Lab III: Basic Electrical Engineering</b> <b>Teaching Scheme :</b> <b>Practical / Term Work : 2 Hrs.</b>													
<b>Teachers Assessment : 50 Marks</b> <b>Credits : 1</b>													
<b>Course Objectives</b>	: At the end of the semester student should be able to know the fundamentals of Electrical Engineering concepts in Theory & In practical he should made aware about methods of practices & safety.												
<b>List of Practicals (Minimum ten experiments to be performed)</b>	: <ol style="list-style-type: none"> <li>1. Study of the accessories to be used in Household wirings. Comparison of AC/</li> <li>2. Concept of phase, Neutral &amp; Earthing for Electrical Installation for House . Single Lamp controlled by single switch</li> <li>3. Study of Fluorescent Tube light</li> <li>4. Study of megger for insulation test and continuity test of wiring installations and machines</li> <li>5. Staircase wiring</li> <li>6. Concept of series lamp .</li> <li>7. Two lamps controlled by two switches,</li> <li>8. Verification of Ohm's Law</li> <li>9. Superposition Theorem</li> <li>10. Thevenin's Theorem</li> <li>11. Study of R-L-C series circuit</li> <li>12. Voltage Ratio &amp; Current ratio of single phase Transformer</li> <li>13. Efficiency &amp; Regulation of single phase Transformer</li> </ol>												
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The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I	
<b>Code No. : MED 124</b> <b>Title: Lab IV : Engineering Drawing</b> <b>Teaching Scheme :</b> <b>Practical / Term Work : 2Hrs.</b>	
<b>Teachers Assessment : 50 Marks.</b> <b>Credits : 1</b>	
<b>Course Objectives</b>	: The objective of learning this subject at undergraduate level is to develop vision, imagination and presentation skill required for drawing and presentation of various engineering components in 2-D and 3-D by using first angle method of projections only except for projections of straight lines.
<b>List of Practicals</b>	: <ol style="list-style-type: none"> <li>1. <b>Sheet No. 1: PROJECTIONS OF LINES:</b> To solve at least two problems based on line inclined to both the planes and one problem on applications of straight lines, with following objectives,               <ol style="list-style-type: none"> <li>i. Obtaining projections of line inclined to both the planes,</li> <li>ii. Determination of true length and true inclinations of the line,</li> <li>iii. Locating traces of the line, and its use for obtaining true length and inclination of the line.</li> <li>iv. To understand applications of straight lines.</li> </ol> </li> <li>2. <b>Sheet No. 2: PROJECTIONS OF PLANES:</b> To solve at least three problems on planes inclined to both the reference planes, with following objectives,               <ol style="list-style-type: none"> <li>i. Obtaining projections of planes of different (polygonal, circular, semicircular etc.) shapes, inclined to both the planes.</li> <li>ii. Determination of true shape and inclinations of the plane.</li> </ol> </li> <li>3. <b>Sheet No. 3: PROJECTIONS OF SOLIDS:</b> To solve at least three problems based on solids with axis inclined to both the reference planes, with following objective,               <ol style="list-style-type: none"> <li>i. Obtaining projections of different regular geometrical solids, having axis inclined to both the reference planes.</li> </ol> </li> <li>4. <b>Sheet No. 4: SECTIONS OF SOLIDS:</b> At least two problems to be solved on sections of solids, with following objectives,               <ol style="list-style-type: none"> <li>i. Drawing section line view of the cutting plane in correct view,</li> <li>ii. Drawing sectional view, and true shape of the section,</li> <li>iii. Determining inclination of the cutting plane from the given true shape of the section.</li> </ol> </li> <li>5. <b>Sheet No. 5: DEVELOPMENT OF SURFACES:</b> At least two problems to be solved on               <ol style="list-style-type: none"> <li>i. Drawing the development of the cut solid,</li> <li>ii. Drawing the FV and TV from the given development.</li> </ol> </li> <li>6. <b>Sheet No. 6: ORTHOGRAPHIC AND SECTIONAL ORTHOGRAPHIC PROJECTIONS:</b> At least two problems to be solved on orthographic projections and sectional orthographic projections, with following objective,               <ol style="list-style-type: none"> <li>i. Reading the 3D drawings and converting it in 2D views.</li> </ol> </li> <li>7. <b>Sheet No. 7: ISOMETRIC VIEWS:</b> Solving at least one problem for isometric view, and one for isometric projections for simple machine parts with following objective,               <ol style="list-style-type: none"> <li>i. Reading the 2D drawings and converting it in 3D views.</li> </ol> </li> </ol>

List of Reference Books	Sr no.	Title	Author	Publication
	1	Elementary Engineering Drawing	N D Bhatt	Charotar Publication House
	2	A Text Book of engineering Graphics	M L Dhabhade	Association of Technical Authors, Pune
	3	Engineering Drawing	Mali & Chaudhary	Vrinda Publishers
	4	Engineering Drawing	Basant Agrawal C. M. Agrawal	Tata McGraw-Hill Education, 2008

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
(Faculty of Engineering & Technology)  
Syllabus of F. Y. B. Tech. Semester-I.

**Code No.: CSE 125**

**Title: Lab V: Computer Fundamentals and Programming**

**Teaching Scheme:**

**Practical / Term Work: 2Hrs**

**Teachers Assessment : 50 Marks**

**Credits: 1**

<b>Course Objectives</b>	:	Term work shall consist of record of the experiments carried out during the course, which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment																				
<b>List of Practicals</b>	:	<ol style="list-style-type: none"> <li>1) If a five-digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. For example if the number that is input is 12391 then the output should be displayed as 23402.</li> <li>2) If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is valid or not. The triangle is valid if the sum of two sides is greater than the largest of the three sides.</li> <li>3) Write a program to print all the ASCII values and their equivalent characters using a <b>while</b> loop. The ASCII values vary from 0 to 255.</li> <li>4) Write a program to print the multiplication table of the number entered by the user. The table should get displayed in the following form.  <math>11 * 1 = 11</math>  <math>11 * 2 = 22</math></li> <li>5) Write a menu driven program which has following options: <ol style="list-style-type: none"> <li>1. Addition of two integers</li> <li>2. Subtraction</li> <li>3. Multiplication</li> <li>4. Exit</li> </ol>                     Make use of switch statement.                 </li> <li>6) A positive integer is entered through the keyboard; write a function to find the binary equivalent of this number using recursion.</li> <li>7) Write a program to pick up the largest number from any <b>n</b> row by <b>n</b> column matrix.</li> <li>8) Write a program that replaces two or more consecutive blanks in a string by a single blank.</li> <li>9) Find the smallest number in an array using pointers.</li> <li>10) Write a program that compares two given dates. To store date use structure say <b>date</b> that contains three members namely date, month and year. If the dates are equal then display message as "Equal" otherwise "Unequal"</li> </ol>																				
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The assessment of term work shall be done on the basis of the following.

- Continuous assessment
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Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester- II									
Code No : MED 126 Title : Lab VI : Workshop Practice I Teaching Scheme: Practical / Term Work: 2 Hrs/week									
Teachers Assessment : 25 Marks. Credits: 1									
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>To have hands on practice for Mechanical Workshop.</li> </ul>								
<b>List of Practicals</b>	<b>Mechanical</b>								
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- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester- II																																		
<b>Code No.: BSH 151</b>																																		
<b>Title: Engineering Mathematics II</b>																																		
<b>Teaching Scheme:</b> Theory : 3 hrs/week Tutorial : 1 hr/week Credits : 4		<b>Class Test: 20 Marks</b> <b>Theory Examination (Duration): 3 Hrs</b> <b>Theory Examination (Marks): 80 Marks.</b>																																
<b>Objectives</b>	:	1) To develop Logical understanding of the subject. 2) To develop mathematical skills so that students are able to apply mathematical methods and principles in solving problems from different engineering fields. 3) To inculcate computational skills.																																
<b>Unit-I</b>	:	Integral Calculus :- Reduction Formulae, Beta Function, Gamma Function, Relation between Beta and Gamma Function <span style="float: right;">(08 Hrs)</span>																																
<b>Unit-II</b>	:	Multiple Integrals:- Double Integration in Cartesian and Polar co-ordinates, Change of order of Integration, Change to polar co-ordinates, Triple integral, Application to areas, volumes, surfaces areas and volume of revolutions <span style="float: right;">(12 Hrs)</span>																																
<b>Unit-III</b>	:	Fourier Series: Dirichlet's conditions, Euler(Euler-Fourier) formulae, Fourier series for function having period $2L$ , Fourier series for even and odd function in the interval $(-L,L)$ , Half range expansions: Fourier sine and cosine series. Change of Interval <span style="float: right;">(10 Hrs)</span>																																
<b>Unit-IV</b>	:	Curve Tracing:- Tracing of Cartesian Curve . Polar curves. parametric curves and Their Rectification <span style="float: right;">(12 Hrs)</span>																																
<b>Unit-V</b>	:	Differential Equations:- Solution of differential equation of first order and first degree: Exact, Linear and Reducible to linear form, Application of first order and first degree to mechanics, electrical circuit, orthogonal trajectories <span style="float: right;">(14 Hrs)</span>																																
<b>Unit-VI</b>	:	Curvature: Radius of curvature for Cartesian curves (Explicit Functions), Radius of curvature at origin, Radius of curvature for polar curves using pedal equation, chord of curvature through the pole, co-ordinates of centre of curvature <span style="float: right;">(04 Hrs)</span>																																
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**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

- 1) Minimum ten questions
- 2) Five questions in each section
- 3) Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4) Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
(Faculty of Engineering & Technology)  
Syllabus of F. Y. B. Tech. (Branch/s) Semester-I/II

Code No.: BSH 103

Title: Engineering Chemistry

Teaching Scheme:

Theory : 3 hrs/week

Tutorial : 1 hr/week

Credits : 4

Class Test : 20 Marks

Theory Examination (Duration) : 3 Hrs

Theory Examination (Marks): 80 Marks

<b>Objectives</b>	: 1) The syllabus of Engineering Chemistry highlights the basic concepts of as applied to all branches of engineering. 2) With the knowledge of Engineering Chemistry, basic principles of engineering can be understood easily. 3) To acquaint students with modern techniques in Engineering Chemistry which can be applied in engineering field
<b>Unit-I</b>	: Water :water quality parameters, Analysis of water –alkalinity (Titrimetry method),Hardness(EDTA method) ,Water for domestic use,water softening processes- Lime Soda process & Ion exchange method, Boiler Problems-Scale,sludge, priming and foaming, caustic embrittlement , their causes and prevention.Numericals on alkalinity & hardness. <p style="text-align: right;">(08 Hrs)</p>
<b>Unit-II</b>	: a) Fuels :classification,calorific value:gross and net calorific value, Solid fuels,Proximate and ultimate analysis of coal and their importance, Carbonisation of coal,coke . Liquid fuels: Petroleum.it's chemical composition and fractional distillation,cracking of heavy oil residues. Thermal and catalytic cracking, knocking, octane number, and cetane number and their significance,power alcohol,Gaseous fuels-Natural gas,LPG.Producer gas, Biogas. b) Lubricant : Definition, Friction ,Lubrication mechanism.Classification.Solid and semi solid lubricants. properties of Liquid Lubricants. Viscosity and viscosity index, Fire point,Cloud point.Pour point.Aniline number.Neutralisation no..Emulsification no.Selection of Lubricants <p style="text-align: right;">(15 Hrs)</p>
<b>Unit-III</b>	: Electrochemistry: electrolytic conductivity, specific,molar and equivalent conductivity, effect of dilution ,determination of conductivity.Cell constant ,Kohlrauch's Law ,applications ,conductometric titrations, .Lead storage battery, fuels cells,Problems on conductivity. <p style="text-align: right;">(07Hrs)</p>
<b>Unit-IV</b>	: Corrosion: Types of corrosion (Dry,wet,atmospheric and soil corrosion), mechanism of corrosion,prevention of corrosion, Oxidation-kinds of oxides formed on metal surfaces,Protective coatings-galvanising ,tinning ,metal cladding. <p style="text-align: right;">(08 Hrs)</p>
<b>Unit-V</b>	: a)Ceramics : Classification ,general properties (Mechanical, Thermal, Electrical), Classification,characteristics of Rocks & Stones, Refractories Glasses (Borosilicate, Coloured,Fibre glasses),cement and Reinforced concrete. b) Polymers-Definition ,Classification ,Types of Molecular weight, Thermo-Plastics and thermosetting plastics.Monomers .structure. properties and application of PE,PP,PVC,Polyester, Nylon 6,Nylon-66.ABS And Natural Rubber.Applications of plastics in Automobile, Electronics industry.Agriculture and Biomedical field.silicons. <p style="text-align: right;">(15 Hrs)</p>
<b>Unit-VI</b>	: Phase Rule and phase diagrams : Phase rule,terms involved,phase diagrams-one component system –water system,sulphur system. Two component system,Lead –tin,Lead silver,Iron-carbon., applications & limitations. <p style="text-align: right;">(07 Hrs)</p>

Reference Books:	Sr. No.	Title	Author	Publication
	1	Engineering chemistry	Jain & jain	Dhanpat Rai publishing
	2	Fundamentals of engineering chemistry(theory and practical)	S.k.singh	New age international publishers
	3	Chemistry in Engineering & technology	J.C Kuriacose&J.Rajaram	
	4	Material Science & processes	S. K. Hajra Choudhary	Indian Book Distribution

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

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<p align="center"><b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering &amp; Technology) Syllabus of F. Y. B. Tech. Semester- II</p>		
<p><b>Code No.: ECE 152</b> <b>Title: Basic Electronics</b> <b>Teaching Scheme:</b> <b>Theory : 3 hrs/week</b> <b>Tutorial : 1 hr/week</b> <b>Credits : 4</b></p>		
		<p><b>Class Test: 20 Marks</b> <b>Theory Examination (Duration) : 3hrs</b> <b>Theory Examination (Marks) : 80 Marks.</b></p>
<b>Objectives</b>	:	<ul style="list-style-type: none"> <li>• Introduction of Electronics to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of Electronics Engineering.</li> <li>• To study different case studies for better understanding the subject</li> </ul>
<b>Unit-I</b>	:	<p>Semiconductor Devices: Semiconductors. types, Constructional features and characteristics of PN junction diode, Zener diode, transistor, UJT,FET,MOSFET.LED.LCD Power Conversion: Rectifiers, types of rectifiers, comparison of rectifiers, principle of regulated power supply <b>(13 Hrs)</b></p>
<b>Unit-II</b>	:	<p>Amplifiers: Ideal Amplifier and its characteristics, BJT and their ratings, performance measure of amplifiers like gain, frequency response, Distortion. Common base, Common emitter, common collector configuration their comparisons <b>(10 Hrs)</b></p>
<b>Unit-III</b>	:	<p>Operational Amplifiers: block diagram, inverting and non inverting configurations, open loop and closed loop of op-amp, parameters, ideal characteristics, application like summing, scaling, averaging, comparator. <b>(07 Hrs)</b></p>
<b>Unit-IV</b>	:	<p>Digital Circuits: Basic logic gates, universal logic gate, Boolean algebra, introduction to logic families, introduction to combinational, sequential logic circuits <b>(07 Hrs)</b></p>
<b>Unit-V</b>	:	<p>Introduction to Measurement system: Generalized measurement system, static and dynamic characteristics .errors and their types, digital multimeter, CRO Transducers: Definition. types. classification of transducer, Temperature transducers like RTD .PT100 thermocouple, thermister, Flow measurement, level measurement, pressure measurement, displacement measurement <b>(17 Hrs )</b></p>
<b>Unit-VI</b>	:	<p>Recent trends in instrumentation: Introduction to automation , introduction to pneumatic and hydraulic system ,introduction to control element <b>(06 Hrs)</b></p>
<b>Reference Books:</b>	:	<ol style="list-style-type: none"> <li>1) Miliman, Halkies- Integrated Electronics - Tata Mc Graw Hill</li> <li>2) Ramakant Gaikwad - Linear Integrated Circuit and operational amplifier - Prientice Hall of India</li> <li>3) R.P.Jain- Modern Digital Electronics - Tata Mc Graw Hill</li> <li>4) A.K.Sawhney- Electronics and Electrical Meaurement and instrumentation- Dhanpat Rai &amp; sons</li> </ol>

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester- II	
<b>Code No.: CED 153</b> <b>Title: Engineering Mechanics</b> <b>Teaching Scheme :</b> <b>Theory : 3 hrs/week</b> <b>Tutorial : 1 hr/week</b> <b>Credits : 4</b>	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• Introduction of Civil Engineering to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of civil engineering</li> <li>• To study fundamentals and to impart knowledge about role of statics and dynamics</li> </ul>
<b>Unit-I</b>	<b>Force System:</b> Basic definitions , Force, Rigid Body, Particle, Moment of a force, Principle of Transmissibility. Principle of super position, Varignon's Theorem, Lami's Theorem, Law of Parallelogram of Force. Resolution and Composition of Forces, Force Systems(co-planer 2-D System only). Analytical method to determine resultant, equivalent force couple. Free body Diagrams, concept of Equilibrium, Equilibrium of 2- D Force System, Analysis of pin-jointed plane frames, types of supports, types of loading, Beam Reactions. (Analytical) (10 Hrs)
<b>Unit-II</b>	<b>Plane Trusses:</b> Analysis of pin jointed plane Trusses by Method of Joint, Method of Section, Graphical Method. <b>Virtual Work:</b> Principle of Virtual Work, Application to Beams, Trusses. (Analytical) (10 Hrs)
<b>Unit-III</b>	<b>Friction:</b> Basic definitions, Laws of Friction, Cone of Friction, Angle of repose, Limiting Equilibrium for bodies under force systems, Belt Friction. <b>Centre of Gravity and Moment of Inertia:</b> Derivation of CG and MI of standard shape of lines, plane Lamina. Radius of Gyration, Parallel and Perpendicular Axis Theorem. (Analytical) (10 Hrs)
<b>Unit-IV</b>	<b>Kinematics of Particles:</b> Linear motion, Motion with constant acceleration, Motion with variable acceleration, Motion Diagrams, Curvilinear motion, Relation between Linear and Curvilinear motion, Tangent and Normal Acceleration, Projectile Motion, Relative Velocity and Resultant Velocity. (Analytical) (09 Hrs)
<b>Unit-V</b>	<b>Kinematics of Rigid Bodies:</b> Plane motion of particles and connected bodies, Linear Motion, Translation, Combined Linear and Translation Motion, ICR. <b>Kinetics of Particles:</b> Linear Motion of Particles and Connected Bodies. (Analytical) (12 Hrs)
<b>Unit-VI</b>	<b>Kinetics of Rigid Bodies:</b> Rotational motion, Rolling without slipping, D'Alemberts Principle, Impact and Impulse <b>Work, Power, Energy:</b> Work-Energy relation for Particles and Rigid Bodies. (Analytical) (09 Hrs)

Reference Books:	:	Sr. No.	Title	Author	Publication	Edition
		1	Engineering Mechanics	R. K. Bansal	Laxmi Publication	Fourth
		2	Engineering Mechanics	A. R. Basu	Dhanpatrai and Sons	Second
		3	Engineering Mechanics	Nelson and Mclean	Mc Graw Hill Book, Inc	Second
		4	Engineering Mechanics	B. Prasad	Khanna Publications	Nineteenth

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

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- 3) Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no.1 and 6 should be of objective nature.
- 4) Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
(Faculty of Engineering & Technology)  
Syllabus of F. Y. B. Tech Semester- II

**Code No.: MED-154**

**Title: Basic Mechanical Engineering**

**Teaching Scheme:**

**Theory : 3 hrs/week**

**Tutorial : 1 hr/week**

**Credits : 4**

**Class Test: 20 Marks**

**Theory Examination (Duration) : 3 Hrs**

**Theory Examination (Marks): 80 Marks**

<b>Objectives</b>	<ul style="list-style-type: none"> <li>• Introduction of Mechanical Engineering to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of Mechanical Engineering such as Power, Design and Production.</li> <li>• To give understanding of the various devices, machines and processes used in day to day life.</li> </ul>
<b>Unit-I</b>	<p><b>Fundamental concepts and Definitions:</b> Scope of thermodynamics, brief idea about various fields of applications. Macroscopic &amp; microscopic description of matter, pure substance, working substance, thermodynamic system &amp; its types, thermodynamic state of system, thermodynamic properties, reversible and non reversible process, cyclic and non-cyclic processes, thermodynamic equilibrium, Zeroth law of thermodynamics. Concept and measurement of temperature. temperature scales, pressure measuring devices.(Numerical treatment on pressure and temperature measurement) <span style="float: right;"><b>(08 Hrs)</b></span></p>
<b>Unit-II</b>	<p><b>Work and Heat :</b> Thermodynamic definition of work, types of work, quasi static process, Pdv work for different processes, Definition of heat, specific heat, modes of heat transfer, laws governing the modes of heat transfer, comparison between heat &amp; work. (numerical on types of works).</p> <p><b>First Law of Thermodynamics :</b>Statement of First law of thermodynamics, verification of first law by Jules experiment, PMM1, First law for cyclic and non cyclic ( Non flow ) processes, Concept of internal energy , enthalpy. Application of first law in various processes. (Numerical on single process only.) <span style="float: right;"><b>(12 Hrs)</b></span></p>
<b>Unit-III</b>	<p><b>Thermal Machines: Boiler:</b> classification, construction and working of boiler (Lancashire, Benson only), boiler mountings and accessories location and applications only.</p> <p>Turbines: Classification, working principle of steam turbine-impulse and reaction type, Gas turbine- open cycle and closed cycle. Internal Combustion Engines: Classification, Construction parts, Working 4/2-stroke Petrol and diesel engines. P-V diagram. Refrigeration and Air conditioning. Definitions Refrigeration, Refrigerating effect, COP, Unit of Refrigeration TOR. Principle and working of vapor compression refrigeration. Principle and working of air conditioner and air cooler. <span style="float: right;"><b>(10 Hrs)</b></span></p>
<b>Unit-IV</b>	<p><b>Introduction to Engineering Materials:</b> Introduction, Classification, Properties, Selection and application of materials .Basic heat treatment Processes: Annealing, Normalizing and Hardening.</p> <p><b>Metal forming and Metal Joining Processes :</b> Hot working and cold working process, its advantage and disadvantages, Brief explanation of operations rolling, forging, extrusion and Wire drawing and its type .Introduction and classification of welding , brief description of Arc Welding and Oxy-Acetylene welding and its application. Soldering and Brazing processes. <span style="float: right;"><b>(12 Hrs)</b></span></p>
<b>Unit-V</b>	<p><b>Machine Tools:</b> Introduction and classification of machine tools, working principle block diagram and</p>

		operations carried on Lathe machine, Drilling machine, Milling and Shaping machines. Specification of above machines. (08 H)			
<b>Unit-VI</b>	:	<b>Power Transmission Elements:</b> Belt: Types of belt and its material, Belt Drives-types and application, velocity ratio, creep and slip in belt. Pulleys: Idler pulley stepped pulley, fast and loose pulley. Gears: Definition, Terminology, types and uses. Gear drives. Bearings-types and application  Keys and Coupling: Types of keys, coupling types, rigid flange and bushed pin flexible coupling. Clutch: Type description of single plate clutch. (10 H)			
<b>Reference Books:</b>	:	Sr. No.	Title	Author	Publication
		1	Fundamentals of classical Thermodynamics	P.K.Nag	Tata Mc Graw Hill
		2	Thermal Engineering	R.K.Rajput	Laxmi Publication
		3	Thermal Engineering	P.L.Ballany	Khanna Publication
		4	Thermodynamics	C.P.Arora	Tata Mc Graw Hill
		5	Engineering Thermodynamics	Edward Arnold and Hawkins J	John Wiley and Sons.
		6	Workshop Technology	Hajara Chowdhary	Media Promoters
		7	Manufacturing Science	Amitabha Ghosh and Mallik	East West Press
		8	Manufacturing Technology	P. N.Rao	Tata Mc Graw Hill

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 80 marks Paper:**

- 1) Minimum ten questions
- 2) Five questions in each section
- 3) Question no 1 from section A and Question no 6 from section B be made compulsory and should cover complete syllabus of the respective section and should be set for ten marks each. The Question no. 1 and 6 should be of objective nature.
- 4) Two questions of 15 marks each from remaining questions from each section A and B be asked to solve.

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester- II	
<b>Code No.: BSH 155</b> <b>Title : Environment &amp; Ecology</b> <b>Teaching Scheme:</b> <b>Theory : 2 Hrs/week</b> <b>Tutorial : --</b> <b>Credits : 02.</b>	
<b>Class Test: 10 Marks</b> <b>Theory Examination (Duration) : 2 Hrs</b> <b>Theory Examination (Marks): 40 Marks.</b>	
<b>Objectives</b>	: 1. To study the direct and indirect effect of industrial products on environmental & ecological factors. 2. To study sources of pollution, etc. 3. To make students understand about Environment and Ecology and factors affecting Global Warming.
<b>Unit-I</b>	: <b>GENERAL INTRODUCTION</b> * Introduction ,components of environment ,environmental degradation * Natural resources, Classification. <span style="float: right;"><b>(05 Hrs)</b></span>
<b>Unit-II</b>	: <b>Ecology:</b> Elements of Ecology, ecological balance, consequences of change, principles of environmental impact assessment, food chain, food wave, ecological pyramids. <span style="float: right;"><b>(05 Hrs)</b></span>
<b>Unit-III</b>	: <b>Air pollution and control</b> Atmospheric composition, climate ,weather,dispersion.sources and effects of pollutants, primary and secondary pollutants, Green house effect ,depletion of ozone layer,standards and control measures <span style="float: right;"><b>(05 Hrs)</b></span>
<b>Unit-IV</b>	: <b>Water pollution and control :</b> Hydrosphere,natural water, pollutants their origin and effects,river/lake/ground water pollution,standards and control,recycling of industrial and muncipal waste water. <span style="float: right;"><b>(06 Hrs)</b></span>
<b>Unit-V</b>	: <b>Land pollution :</b> Lithosphere pollutants (muncipal,industrial,commercial, agricultural,hazardous solid wastes):their origin and effects collection and disposal of solid wastes ,recovery and conversion methods, recycling of plastic and metal waste. <span style="float: right;"><b>(06 Hrs)</b></span>
<b>Unit-VI</b>	: <b>Noise pollution :</b> Sources ,effects standards and control. <span style="float: right;"><b>(03 Hrs)</b></span>
<b>Reference Books:</b>	: 1) Introduction to Environmental Engineering- Masters,G.M. 2) Environmental science - Nebel,B,J 3) Ecology - Odem,E.P.

**Section A:** Includes Unit I, II and III; **Section B:** Includes Unit IV, V and VI.

**Pattern of Question Paper:**

The six/four units in the syllabus shall be divided in two equal parts i.e. 3 units respectively. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

**For 40 marks Paper:**

1. Minimum eight questions
2. Four questions in each section
3. Question no 1 from section A and Question no 5 from section B be made compulsory and should have five bits of two marks out of which three to be solved
4. Two questions from remaining questions from each section be asked to solve having weightage of 7 marks:

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester-I/II				
<b>Code No.: BSH 122</b>		<b>Teachers Assessment: 50 Marks.</b>		
<b>Title: Lab I/II Engineering Chemistry.</b>		<b>Credits: 1</b>		
<b>Teaching Scheme:</b>		<b>Practical/Term Work: 2 Hrs/week</b>		
<b>Course Objectives</b>	:	1) The syllabus of Engineering Chemistry highlights the basic concepts of as applied to all branches of engineering. 2) With the knowledge of Engineering Chemistry, basic principles of engineering can be understood easily. 3) To acquaint students with modern techniques in Engineering Chemistry which can be applied in engineering field		
<b>List of Practicals (Minimum ten experiments to be performed)</b>	1	Determination of hardness (Total, temporary & permanent) of water –EDTA method.		
	2	Estimation of different types and amounts of alkalinity in water-Indicator method.		
	3	Determination of percentage of moisture and ash in a coal sample.		
	4	Determination of Acid value of lubricating oil.		
	5	Measurement of corrosion rate –using digital mili voltmeter.		
	6	Determination of molecular weight of a polymer-Viscometric Method.		
	7	Estimation of calcium from cement.		
	8	Study of micro-structure of alloys.		
	9	Determination of emulsification number of oil.		
	10	Preparation of Bakelite or urea formaldehyde plastic		
	11	Determination of pH value of different solutions by pH paper & pH meter		
	12	Study effect of dilution on conductivity of electrolyte.		
	13	Conductometric Titration		
	14	Determine viscosity of oil by Redwood viscometer		
<b>List of Reference Books</b>	Sr. No.	Title	Author	Publication
	1	Engineering chemistry	Jain & jain	Dhanpat Rai publishinn
	2	Fundamentals of engineering chemistry(theory and practical)	S.k.singh	New age international Publishers
	3	Chemistry in Engineering & technology	J.C Kuriacose&J.Rajaram	
4	Material Science & processes	S. K. Hajra Choudhary	Indian Book Distribution	

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<b>Dr.BabasahebAmbedkarMarathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester- II		
<b>Code No.: ECE 171</b> <b>Title: Lab VII: Basic Electronics</b> <b>Teaching Scheme:</b>		
<b>Practical / Term Work : 2 Hrs/week</b>		<b>Teachers Assessment : 50 Marks</b> <b>Credits: 1</b>
<b>Course Objectives</b>	:	<ul style="list-style-type: none"> <li>• Introduction of Electronics to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of Electronics Engineering.</li> <li>• To study different case studies for better understanding the subject</li> </ul>
<b>List of Practicals</b>	1	V-I characteristics of p-n junction Diode
	2	Input, output characteristics of CE configuration
	3	Drain characteristics and of JFET
	4	Regulation characteristics of half wave rectifier
	5	Regulation characteristics of full wave rectifier
	6	Differentiating and integrating circuit using op-amp
	7	study of logic gates(AND, OR, NOT, NAND, Ex-OR)
	8	study of strain gauge
	9	study of bourdon tube
	10	Measurement of displacement using using LVDT
<b>List of Reference Books</b>		1) Miliman, Halkies- Integrated Electronics - Tata Mc Graw Hill 2) Ramakant Gaikwad - Linear Integrated Circuit and operational amplifier - Prentice Hall of India 3) R.P.Jain- Modern Digital Electronics - Tata Mc Graw Hill 4) A.K.Sawhney- Electronics and Electrical Meaurement and instrumentation- Dhanpat Rai & sons

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering & Technology) Syllabus of F. Y. B. Tech. Semester- II						
<b>Code No. : CED 172</b> <b>Title : Lab VIII: Engineering Mechanics</b> <b>Teaching Scheme:</b> <b>Practical/Term Work : 2 hrs/week</b>						
			<b>Teachers Assessment : 50 Marks</b> <b>Credits : 1</b>			
<b>Course Objectives</b>	:	<ul style="list-style-type: none"> <li>• Introduction of Civil Engineering to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of civil engineering</li> <li>• To study fundamentals and to impart knowledge about role of statics and dynamics</li> </ul>				
<b>List of Practicals</b>	:	Part I: Graphical Solutions : ( Two problems each) Part II: Laboratory Experiments : (Any Six)				
		<b>Sr. No.</b>	<b>Particulars</b>			
		Part I				
		1	Resultant of Concurrent and Non- Concurrent coplanar Force System			
		2	Beam Reaction			
		3	Analysis of Pin-jointed Trusses			
		4	ICR			
		Part II				
		5	Parallelogram Law of Forces			
		6	Lami's Theorem			
		7	Beam Reactions			
		8	Member Forces in Trusses			
		9	Jib Crane			
		10	Moment of Inertia of Fly Wheel			
		11	Simple Screw Jack			
12	Differential Axle and Wheel					
13	Belt Friction					
14	Inclined Plane – Limiting Equilibrium					
<b>List of Reference Books</b>	:	<b>Sr. No.</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>	<b>Edition</b>
		1	Engineering Mechanics	R. K. Bansal	Laxmi Publication	Fourth
		2	Engineering Mechanics	A. R. Basu	Dhanpatrai and Sons	Second
		3	Engineering Mechanics	Nelson and Mclean	Mc Graw Hill Book, Inc	Second
		4	Engineering Mechanics	B. Prasad	Khanna Publications	Nineteenth

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

<p align="center"><b>Dr. Babasaheb Ambedkar Marathwada University, Aurangabad</b> (Faculty of Engineering &amp; Technology) Syllabus of F. Y. B. Tech. (Branch/es) Semester- II</p>					
<p><b>Code No.: MED 173</b> <b>Title: Lab IX: Basic Mechanical Engineering</b> <b>Teaching Scheme:</b> <b>Practical/Term Work : 2 Hrs/week</b></p>		<p><b>Teachers Assessment : 50 Marks</b> <b>Credits: 1</b></p>			
<b>Course Objectives</b>	:	<ul style="list-style-type: none"> <li>• Introduction of Mechanical Engineering to the students from all branches of engineering</li> <li>• To understand the scope of the different fields of Mechanical Engineering such as Power, Design and Production.</li> <li>• To give understanding of the various devices, machines and processes used in day to day life.</li> </ul>			
<b>List of Practicals (Minimum ten experiments to be performed)</b>	:	Term work shall consist of a record book on laboratory experiments studies on the following:			
		<b>Sr.No.</b>	<b>Particulars</b>		
		1	Study and demonstration Low Pressure Boiler(any one)		
		2	Study and demonstration High Pressure Boiler(any one)		
		3	Study and demonstration Steam Turbine		
		4	Study and demonstration Refrigerator		
		5	Study and demonstration Air Conditioner		
		6	Study and demonstration Air Cooler.		
		7	Study and demonstration Lathe Machine		
		8	Study and demonstration Shaper Machine		
		9	Study and demonstration Milling machine		
		10	Study and demonstration of Gears		
	11	Assignment on topic 1,2,3,4			
<b>List of Reference Books</b>	:	<b>Sr. No.</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>
		1	Fundamentals of classical Thermodynamics	P.K.Nag	Tata Mc Graw Hill
		2	Thermal Engineering	R.K.Rajput	Laxmi Publication
		3	Thermal Engineering	P.L.Ballany	Khanna Publication
		4	Thermodynamics	C.P.Arora	Tata Mc Graw Hill

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above

**Dr. Babasaheb Ambedkar Marathwada University, Aurangabad**  
 (Faculty of Engineering & Technology)  
 Syllabus of F. Y. B. Tech. Semester - I.

**Code No.: BSH 174**  
**Title: Lab X : Development of Skills - I**  
**Teaching Scheme:**  
**Practical / Term Work: 2 Hrs/week**

**Teachers Assessment: 50 Marks**  
**Credits: 1**

<b>Course Objectives</b>	:	1. To help engineering students in acquiring adequate mastery of communicative English language primarily listening and speaking skills.  2. To provide language training to the students to enable them to understand and acquire knowledge in technical subjects.  3. To help students develop their personal and interpersonal skills to enable them to make their transition from college to workplace smoother and help them excel in their jobs
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<b>List of Practicals</b>	:	<b>Sr. No.</b>	<b>Section</b>	<b>Contents</b>
		1	Introduction	Importance of Soft Skills in general, Communication Skills in particular.
		2	Communication Process	Basic Concepts, Kinds, Routes Forms, Factors, Barriers.  Activity in understanding the barriers in communication.
		3	Oral communication	Introduction to various types: Formal. Informal. Face to Face. Telephonic.  Activity: Self Introduction or Introduction in pairs.
		4	Listening Skills	Listening process. Hearing and Listening. Types of listening - superficial, appreciative, focused, evaluative, attentive, empathetic. Barriers in listening. Effective listening strategies.  Activities: Listening in conversational interaction, Listening to structured talks, Team listening.
		5	Speaking Skills	Phonetics and problems in learning and using pronunciation  Vowel sounds  Consonant Sounds  Word accent  Sentence Intonation
		6	Conversation Skills(Dialogue)	Conversation skills in different situations (Expressing different language functions - orders, requests, advice, suggestions, questions, Opinions (agreement / disagreement), defining, describing  Activities: Skits with Social messages and Role Plays

106 x 50

	7	Public Speaking and Presentation skills	Planning, Preparation, Organization, Delivery in Seminars Compeering/Anchoring Activities: Speeches, JAM Sessions	
<b>List of Reference Books</b>	<b>Sr. No.</b>	<b>Title</b>	<b>Author</b>	<b>Publication</b>
	1	The Essence of Effective Communication	Adrian Budday, Ron Ludlow and Fergus' Panton	Prentice Hall of India-Private Ltd.
	2	Communicating in Style	Yateendra Joshi	The energy Resource Institute
	3	Effective Technical Communication	Anne Eisenberge	Mc Graw Hill International Editors
	4	Professional Communication Skills	A. K. Jain, Pravin, S. R. Bhatia, A. M. Sheikh	S. Chand & Company Ltd.

The assessment of term work shall be done on the basis of the following.

- Continuous assessment
- Performing the experiments in the laboratory
- Oral examination conducted on the syllabus and term work mentioned above