Suggestion call on Proposed Rules and Syllabus of Engineering.

Proposed Rules and Regulations for Four Year Degree Course in Engineering of **Dr. Babasaheb Ambedkar Marathwada University, Aurangabad** and proposed syllabus of first Year Engineering [F.E.]. All Citizens, Students, Persons concerned with education field are requested to go through the proposed Rules and Regulations for the Four Year Engineering and Scheme and detailed syllabus of First Year Engineering to be implemented from the academic year 2011-12 and onwards. All are requested to give there suggestion, correction in a Proposed draft on or before 16th July, 2011. Your suggestion may please be mailed on rgtated@yahoo.com or **shamuwelb07@gmail.com.**

Sd/-

Deputy Registrar,

[Academic].

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,

AURANGABAD

PROPOSED

RULES AND REGULATIONS

FOR

FOUR YEAR DEGREE COURSE IN ENGINEERING

With effect form Academic Year 2011-2012

RULES AND REGULATIONS

FOR

FIRST YEAR DEGREE COURSE IN ENGINEERING (REVISED)

(Applicable from the Academic Year 2011- 2012)

Note:

1. All the Rules and Regulations, hereinafter specified shall be read as a whole for the purpose of interpretation.

ADMISSION

1. Admission to first year engineering shall be carried out as per the rules and regulations prescribed by the competent authority as appointed by the Government of Maharashtra from time to time.

DURATION AND COURSES OF STUDY

1. The duration of the course is four years. Each of the four academics years shall be divided into two semesters herein after referred to as the semester I and semester II in chronological order. Each semester shall comprise

Instructions	…… 15 weeks
Preparation holiday (Includes practical exams)	…… 2 weeks

2. Candidate who fails to fulfill all the requirements for the award of the degree as specified hereinafter within eight academic years form the time of admission, will forfeit his/her seat in the course and his/her admission will stand cancelled.

RULES AND REGULATION OF ATTENDANCE

1. Candidates admitted to a particular course of study are required to pursue a "Regular course of study" as prescribed by the University before they are permitted to appear for the University Examination.

2. "A regular course of study" means putting in attendance not less than 90%.

3. a) In special cases and for sufficient causes shown, the Principal of the institute may, on the specific recommendation the 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 Principal 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 entire course of study leading to degree in Engineering and Technology.

4. "Active Participation in N.C.C/N.S.S. Camps or Inter collegiate or Inter University or Inter State or International matches or debates of Educational Excursions or such other Inter University activities as approved by the authorities involving journeys outside the city in which the college is situated will not be counted as absence. However, such 'absence shall not exceed (4) weeks per semester of the total period of instructions. Such leave should not be availed more than twice during the entire course of study.

5. The attendance shall be calculated on the aggregate of the papers/subjects from the date of commencement of the semester.

6. In case of the candidates who fail to put in the required attendance in a course of study, he/she shall be detained in the same class and will not be recommended to appear for the University examination.

7. A candidate detained in semester I should take readmission in next academic year as a regular student and shall have to complete all the theory and practicals as a regular student.

8. In case a candidate is detained in semester II, he/she shouldl take admission to Semester II of next academic year and complete all the theory and practicals as a regular student of semester II

9. In case of change of syllabus the candidate even if detained in semester II should take readmission in next academic year for Semester I and II as a regular student and complete all the theory and practicals as a regular student.

10. SCHEME OF INSTRUCTIONS AND EXANINATION

1. Instructions about the curriculum in the various subjects in each semester of all the four years shall be provided by the University.

2. The details of instruction period, examination schedule, vacations etc. shall be notified by the Principal of the College as per the University academic calendar

3. The medium of instruction and examination shall be English.

4. At the end of each semester, university examinations shall be held as prescribed in the respective schemes of examination.

5. The examinations prescribed may include written papers, practical and oral tests, inspection of certified sessional work in Drawing and Laboratories and work done by them in each practical examination, along with other materials prepared or collected as part of Lab work/Project.

6. All the rules for examinations prescribed by the University from time to time shall be adhered to.

7. A candidate shall be deemed to have fully passed the Examination of a semester, if he/she secures not less than the minimum marks/grade as prescribed.

8. Institutions will be encouraged to adopt modern tools in classroom/labs to deliver the course contents.

9. Institutions will be encouraged to conduct online class tests.

O. The First Examination in Engineering will be held in two parts F.E. semester-I and F. E. semester-II. No candidate will be admitted to F.E. semester-I examination unless he/she produce testimonials of having kept one term, for the subject under F.E. semester-I satisfactorily in a college of engineering affiliated to this University after passing the H.S. C. XII Standard examination of the Maharashtra State Board of Secondary and Higher Secondary Education or any other examination recognized as equivalent thereto as per the admission rules to first year engineering prescribed by the government of Mahharashtra from time to time.

No candidate will be admitted to F.E. semester-II examination unless he/she produces testimonials of having kept one term for the subjects under F.E. semester-I and thereafter one term for the subjects under F. E. semester-II satisfactorily, in a college of Engineering affiliated to this University.

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**	**TH**	**T W**	**P**	**Total**	**Duration of Theory Examination**
BSH101	Engineering Mathematics-I	3	1	-	4	20	80	-	-	100	3 Hrs
BSH102/ BSH103	Engineering Physics/ Engineering Chemistry and Environmental science	4	-	-	4	20	80	-	-	100	3 Hrs
MED104	Engineering Graphics	2	-	-	2	20	80	-	-	100	4 Hrs
EED105	Elements of Electrical Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
CED106	Elements of Civil Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
BSH121/ BSH122	Lab I/Lab II Engineering Physics/ Engineering Chemistry and Environmental science	-	-	2	2	-	-	50	-	50	
MED123	Lab III Engineering Graphics	-	-	4	4	-	-	50	-	50	
EED124	Lab IV Elements of Electrical Engineering	-	-	2	2	-	-	50	-	50	
CED125	Lab V Elements of Civil Engineering	-	-	2	2	-	-	50	-	50	
MED126	Lab VI Workshop Practice-I	-	-	2	2	-	-	50	-	50	
	Total	**17**	**1**	**12**	**30**	**100**	**400**	**250**	**-**	**750**	

Sub No.	SEMESTER-II	Contact Hrs / Week				Examination Scheme					
	Subject	**L**	**T**	**P**	**Total**	**CT**	**TH**	**T W**	**P**	**Total**	**Duration of Theory Examination**
BSH151	Engineering Mathematics-II	3	1	-	4	20	80	-	-	100	3 Hrs
BSH103/ BSH102	Engineering Chemistry and Environmental science/ Engineering Physics	4	-	-	4	20	80	-	-	100	3 Hrs
CED152	Engineering Mechanics	4	-	-	4	20	80	-	-	100	3 Hrs
MED153	Elements of Mechanical Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
EXD154	Elements of Electronics and Computer Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
BSH122/ BSH121	Lab II/Lab I Engineering Chemistry and Environmental science/ Engineering Physics	-	-	2	2	-	-	50	-	50	
CED171	Lab VII Engineering Mechanics	-	-	2	2	-	-	50	-	50	
MED172	Lab VIII Elements of Mechanical Engineering	-	-	2	2	-	-	50	-	50	
EXD173	Lab IX Elements of Electronics and Computer Engineering	-	-	2	2	-	-	50	-	50	
MED174	Lab X Workshop Practice-II	-		2	2		-	50	-	50	
	Total	**19**	**1**	**10**	**30**	**100**	**400**	**250**	**-**	**750**	

L: Lecture hours per week T: Tutorial hours per week P: Practical hours per week CT: Class Test
TH: University Theory Examination TW: Term Work P: Practical/Oral Examination

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i. In case a candidate fails in one or more heads of passing at the F.E. semester-I Examination after taking that examination at the end of first term as a regular student, he/she will be allowed to appear again for only those heads of passing in which he/she has failed at his/her immediately subsequent semester-I examination.

ii. That the marks obtained by the candidate at semester-I Examination shall be carried forward unless the candidate desires to appear for a paper in which he has failed and then gracing of marks should be done as a whole for semester-I and semester-II examination taken together.

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a) Candidates who secure 45% or more but less than 50% marks in the aggregate and pass the examination will be declared to have passed the examination in Pass Division.

b) Candidates who secure 50% or more but less than 60% marks in the aggregate and pass the examination will be declared to have passed the examination in Second Division.

c) Candidates who secure 60% or more but less than 66% marks in the aggregate and pass the examination will be declared to have passed the examination in first Division.

d) Candidates who Secure 66% or more marks in the aggregate and pass the examination will be declared to have passed the examination in First Division with Distinction.

e) For calculating the percentage for the purpose of giving weightage while awarding division in Final Examination to the students admitted to first year engineering, the maximum marks prescribed and the marks obtained by the examinee in the particular examinations shall be taken in to consideration with the following weightages.

F.E. - 10%
S.E.- 10%
T.E. – 40%
B. E. – 40%
This shall be applicable for the students admitted in first year from academic year 2011-2012 onwards.

f) In case of the students directly admitted to the second year, the weightage while awarding division in Final Examination the maximum marks prescribed and the marks obtained by the examinee in the particular examinations shall be taken in to consideration

S.E.- 20%
T.E. – 40%
B. E. – 40%
This shall be applicable for the students admitted in the second year engineering from academic year 2012-2013 onwards.

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In case a candidate fails in the examination but desires to appear again thereat.

a) He may, at his option, claim exemption form appearing in the head or heads of passing in which he has passed.

b) Such exemption, if claimed, shall cover all the heads of passing- in which it can be claimed.

c) Such exemption, if not availed of at the immediately subsequent appearance of the candidate at the examination, shall be deemed to have lapsed.

d) He /She may, at his option claim exemption from appearing in head or heads of passing of his choice and appear in the remaining head or head/s of passing to make-up the deficiency in the aggregate, if he has passed in all the heads of passing but has failed to secure a minimum of 45% of the aggregate marks.

e) The Marks obtained by a candidate for such term work as separately assessed will be carried over unless fresh term work is presented by him. A candidate whose marks are thus carried over shall be eligible for a division provided he/she does not avail himself of exemption in any head of passing excepting term work.

f) For the purpose of deciding whether a candidate claiming exemption in accordance with (a), (b), (c) above or (d) and (e) above has as required by R.260 secures 45% of the total marks obtainable in the whole examination the marks at his/ her previous examination/examination in the head or heads of passing in which he/she is exempted will be carried over. Candidates passing the examination in this manner shall not be eligible for a division or prizes or scholarships at the examination.

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RULE FOR COMBINED PASSING

1) To pass the examination a candidate must obtain minimum 40% of Marks in each Theory Paper & class test taken together however the candidate must obtain minimum 35% of Marks at the University Examination. The candidate must obtain a minimum aggregate of 45% of the total Marks obtainable at the F.E. Semester -I & II Examination taken together.

To pass a subject where there is no provision of class test, the candidate must obtain 40% of Marks in the University Examination.

Gracing should be done for the performance at University Examination or University Examination and class test taken together.

Minimum two-class tests should be conducted in a semester for the theory subject if provided. The average performance of the Two-class tests should be forwarded to the University by the college along with the term work marks.

If candidate fails to secure 40% of Marks at University examination and class test taken together he can opt to improve his performance at the subsequent University Examination only. The improved performance at the University Examination should not be considered for the Merit/Medal/Prize etc.

If the candidate remains absent for the class-test, his performance should be treated as ‘Zero’ Marks.

Minimum marks required for passing in term work shall be 40%. If a candidate secures less than 40% in any of the term work or fails to submit term work shall be detained in the same class.

2) The term work of First Year Engineering revised course of Three (3) Subjects of semester-I & Three (3) Subjects of semester-II to be treated as Oral/Practical/External Assessment of term work/heads for passing. The three subjects of Semester I & II shall be as follows:-

Semester-I: - 1) Engineering Graphics
2) Elements of Civil Engineering
3) Elements of Electrical Engineering
Semester-II: - 1) Elements of Mechanical Engineering
2) Engineering Mechanics
3) Elements of Electronics & Computer Engineering

RULE FOR A T K T

For securing ATKT at First year engineering course candidate should clear (pass) as per the provision of R in 12 heads of passing out of 16 heads of passing.

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GENERAL RULES OF EXAMINATION

1. Application for permission to appear at every examination shall be made in the prescribed from, accompanied by one passport size full face photograph (not profile) along with the necessary certificates and the prescribed fee, should be submitted to the Principal of the institute on or before the date fixed for this purpose.

2. When a candidate's application is found in order and he/she is eligible to appear at an Examination, the Principal of the institute is empowered to furnish him/her with a Hall-Ticket with the photograph affixed to it, enabling the candidate to appear in the Examination, and this Hall-Ticket shall have to be produced by the Candidate before he/she is admitted to the premises where the Examination is being held.

3. A Candidate who does not present himself/herself for the examination for any reason whatsoever, excepting shortage of attendance, shall not be entitled to claim refund of the whole or part of the examination fee, for subsequent Examination(s).

4. As engineering is a full time course, no candidate shall be allowed to put in attendance for a course or appear at examinations for different degrees and different faculties at one and the same time.

5. Students who have appeared once at any examination of the course need not put in fresh attendance, if they wish to reappear at the corresponding examination, not withstanding the fact that the College may have introduced new subject. They will, how ever, have to appear at the examinations according to the scheme of examination and syllabi in force

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EQUIVALENCE OF THE SUBJECTS

Whenever a course or scheme of instruction is changed in a particular year, three more examinations immediately following thereafter shall be conducted according to the old syllabi/regulations. Also candidates not appearing at the examinations or failing in them shall take the examination subsequently according to the changed syllabi/ regulations as per the equivalence of the subjects as prescribed by the university.

Proposed Coding System of Subject/Paper

Six digit code for a subject (UG courses)

1	2	3	4	5	6
Branch			Year	Subject no	
CED			1 First year UG	Semester I	
MED			2 Second year UG	1 -20 Theory	
EEP			3 Third year UG		
ECE			4 Fourth year UG	21-30 Practical	
EXE			5 Fifth year UG		
ETC				31-40 Service courses	
IEX					
PED				41-49 Electives	
CSE					
CTD				Semester II	
COE				51 -70 Theory	
ITD					
EED				71-80 Practical	
EEE					
ARH				81-90 Service courses	
BSH				91-99 Electives	

Structure of syllabus of subject

Code No: **Title:**

Teaching Scheme **Examination Scheme**

Theory: hours/week **Class Test: Marks**

Tutorial: hours/week **Theory examination: Maximum hours**

Practical/ TermWork : hours/week **Theory examination: Maximum Marks**

Practical/ Oral examination: Maximum Marks

Objectives: 1

2

3

Unit 1:

Unit 2:

Unit 3:

Unit 4:

Unit 5:

Unit 6:

Text Books: 1

2

Reference Books: 1

2

3

4

Pattern of Question Paper:

The six/four units in the syllabus shall be divided in two equal parts i.e 3/2 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 have at least eight bits of two marks out of which five to be solved
4. Two questions from remaining questions from each section A and B be asked to solve having weightage of 15 marks

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 at least 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.

0.95 GRACE MARKS FOR PASSING IN EACH HEAD OF PASSING (THEROY / 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/ Sessional) 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 percent 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 semester/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.

0.96 GRACE MARKS FOR GETTING HIGHER CLASS

A candidate who passes in all the subjects and heads of passing in the examination without the benefit of either gracing is condonation rules and whose total number of marks falls short for securing Second Class/Higher Second class of First Class by marks not more than 01 percent of the aggregate marks of that examination or upto 10 marks, whichever is less, shall be given the required marks to get the next higher class or grade as the case may be.

Provided that benefit of the above mentioned grace marks shall not be given, if the candidate fails to secure necessary passing marks in the aggregate head of passing also, if prescribed in the examination concerned.

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 etc.

0.97 GRACE MARKS FOR GETTING DISTINCTION IN THE SUBJECT ONLY.

A candidate who passes in all the subject/heads of passing in the examination without benefit of either gracing or condonation rules and whose total number of marks in the subject/s falls short by not more than three marks for getting distinction in the subject/s shall be given necessary grace marks up to three in maximum two subjects, subject to maximum 01 percent of the total marks of that head of passing whichever is more, in a given examination.

Provided that benefit of the above mentioned grace marks shall be given to the candidate only for such examination/s of which provision for distinction in a subject has been prescribed.

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 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 percent of the aggregate marks of the examination or 10 percent 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 upto 10 marks only.

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

Provided that this condonation of marks 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 etc.

0.106 (A) 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 Principal, of the college or Head of the recognized Institution 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 absence 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. Interfering with or counterfeiting of University/College Institution seal or answer books or office stationary used in the examination.

ix. Impersonation at the University/college/Institution examination..

x. 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.

xi. 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 of chief Conductor or any other authorized person to the Controller of Examinations, Principal or Head of the Institutions 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 refereed 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, Principal of the College concerned, or Head of the recognized institution 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 Principal/Head of the concerned college/recognized Institution 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 or 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) (Performa 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/Principal/Head of the Institution, 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/Principal/Head of the Institutions, as the case may be.

PUNISHMENT

The competent authority concerned i.e. the Board of Examinations in the case of University examination, the concerned Principal in the case of college examinations held by the recognized Institutions, after taking into consideration the report of the committee shall pass such orders as it deem fit including granting the student benefit of doubt, issuing warning or exonerating him/her from the charges and shall impose any one or more of the following punishment on the student/s found guilty of using unfair means:-

(a) Annulment of performance of the student in full or in part in the examination he/she has appeared for.

(b) Debarring student from appearing for any examination of the University or college Institution for a stipulated period not exceeding five year.

(c) Debarring student from appearing for any examination of the University or college Institution for a stipulated period not exceeding five year.

(d) Cancellation of the University or College or Institution scholarship/s or award/s prize or medal etc. awarded to him/her in that examination.

(e) In addition to the above mentioned punishment, the competent authority may impose a fine not exceeding Rs.300/- on the student declared guilty. If the student concerned fails to pay the fine within a stipulated period, the competent authority may impose on such a student additional punishment/penalty as it may deem fit.

(f) The student concerned be informed of the punishment finally imposed on him/her in writing by the competent authority or by the officer authorized by it in this behalf, under intimation to the College/Institution he/ she belongs to.

(g) An appeal against the findings of the committee shall lie with the concerned competent authority whose decision shall be final and binding.

(h) An appeal made in writing within a period of 30 days from the date imposition of the punishment shall be considered by the competent authority on merit and shall be decided on the basis of the evidence available in the case and shall be heard in person in deserving cases, if the competent authority finds substance in the appeal, the competent authority shall supply a typed copy of the relevant extract of fact-finding report of the inquiry committee, as well as documents relied upon (if not strictly confidential). Decision in the appeal shall be informed to the student concerned accordingly.

(i) The court matters in respect of the unfair means cases should be dealt with by the respective competent authority.

(j) As far as possible the quantum of punishment should be as prescribed (Category-wise in Appendix-I)

APPENDIX-I

THE BROAD CATEGORIES OF UNFAIR MEANS ADOPTED BY STUDENTS AT THE UNIVERSITY/ COLLEGE/ INSTITUTION EXAMIANTION AND THE QUANTUM OF PUNISHMEN T 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 ot 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 Intuition 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.
(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
(c)	Smuggling in of written answer book and forging signature of Jt, Supervisor thereon	Exclusion of the student from University or College or Institution. Examination for four 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 insertion in answer book.	Exclusion of the student from University or College or Institution examination for four additional examinations.
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 created 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)
(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 five additional examinations
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.	**PRACTICAL/DISSERTATION/PROJECT REPORT EXAMS.**
	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.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,

AURANGABAD

PROPOSED

SCHEME AND DETAILED SYLLABUS

Of

FIRST YEAR ENGINEERING (F. E.)

OF

FOUR YEAR DEGREE COURSE IN ENGINEERING

With effect form Academic Year 2011-2012

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**	**TH**	**T W**	**P**	**Total**	**Duration of Theory Examination**
BSH101	Engineering Mathematics-I	3	1	-	4	20	80	-	-	100	3 Hrs
BSH102/ BSH103	Engineering Physics/ Engineering Chemistry and Environmental science	4	-	-	4	20	80	-	-	100	3 Hrs
MED104	Engineering Graphics	2	-	-	2	20	80	-	-	100	4 Hrs
EED105	Elements of Electrical Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
CED106	Elements of Civil Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
BSH121/ BSH122	Lab I/Lab II Engineering Physics/ Engineering Chemistry and Environmental science	-	-	2	2	-	-	50	-	50	
MED123	Lab III Engineering Graphics	-	-	4	4	-	-	50	-	50	
EED124	Lab IV Elements of Electrical Engineering	-	-	2	2	-	-	50	-	50	
CED125	Lab V Elements of Civil Engineering	-	-	2	2	-	-	50	-	50	
MED126	Lab VI Workshop Practice-I	-	-	2	2	-	-	50	-	50	
	Total	**17**	**1**	**12**	**30**	**100**	**400**	**250**	**-**	**750**	

Sub No.	SEMESTER-II	Contact Hrs / Week				Examination Scheme					
	Subject	**L**	**T**	**P**	**Total**	**CT**	**TH**	**T W**	**P**	**Total**	**Duration of Theory Examination**
BSH151	Engineering Mathematics-II	3	1	-	4	20	80	-	-	100	3 Hrs
BSH103/ BSH102	Engineering Chemistry and Environmental science/ Engineering Physics	4	-	-	4	20	80	-	-	100	3 Hrs
CED152	Engineering Mechanics	4	-	-	4	20	80	-	-	100	3 Hrs
MED153	Elements of Mechanical Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
EXD154	Elements of Electronics and Computer Engineering	4	-	-	4	20	80	-	-	100	3 Hrs
BSH122/ BSH121	Lab II/Lab I Engineering Chemistry and Environmental science/ Engineering Physics	-	-	2	2	-	-	50	-	50	
CED171	Lab VII Engineering Mechanics	-	-	2	2	-	-	50	-	50	
MED172	Lab VIII Elements of Mechanical Engineering	-	-	2	2	-	-	50	-	50	
EXD173	Lab IX Elements of Electronics and Computer Engineering	-	-	2	2	-	-	50	-	50	
MED174	Lab X Workshop Practice-II	-		2	2		-	50	-	50	
	Total	**19**	**1**	**10**	**30**	**100**	**400**	**250**	**-**	**750**	

L: Lecture hours per week T: Tutorial hours per week P: Practical hours per week CT: Class Test
TH: University Theory Examination TW: Term Work P: Practical/Oral Examination

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I

BSH101: ENGINEERING MATHEMATICS I

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	Theory	80 Marks
Tutorial	1 Hr/week	Class Test	20 Marks
Batch size for tutorial	Max 30 students/batch	Duration of Theory paper	3Hrs.

Objectives:

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.

Unit 1:

Complex Numbers With Applications: Representation of a complex number in Cartesian & Polar co-ordinate systems, Argand's diagram, De'Moivre's Theorem, circular and inverse circular functions, hyperbolic and inverse hyperbolic functions, Separation into Real and Imaginary parts of circular and hyperbolic functions, logarithm of complex numbers. **(6 Hours)**

Unit 2:

Successive differentiation: N^{th} derivative of standard functions, Taylor's & Maclaurin's theorem, expansion of functions using i) standard series ii) method of differentiation & integration. Indeterminate forms.

Convergence of power series using Ratio Test, Comparison Test, Cauchy's n-th root Test. **(8 Hours)**

Unit 3:

Ordinary Differential Equations:, Exact differential equation, linear differential equation, reducible to linear differential equation. Applications of Ordinary Differential Equations to

i) Electrical Engineering, ii) Mechanics, iii) Orthogonal trajectories. **(6 Hours)**

Unit 4:

Curve Tracing and Rectification: Tracing of curves in Cartesian (explicit type), Parametric & Polar form, Rectification of Cartesian, Parametric and Polar curves. **(10 Hours)**

Unit 5:

Partial Differentiation: Partial Derivatives, Total Differentiation, Euler's Theorem on Homogeneous Functions, Change of Independent Variables. **(5 Hours)**

Unit 6:

Applications of **Partial Differentiation:** Jacobian, chain rule, Maxima and Minima of Functions of two variables, Lagrange's method of undetermined multipliers. **(5 Hours)**

Note: All Theorems are without proofs

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

TEXT BOOKS:

1. A Text Book of Engineering Mathematics (Volume-I, II), P. N. Wartikar and J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
2. Higher Engineering Mathematics by B. S. Grewal, Khanna Publications, New Delhi.

REFERENCE BOOKS:

1. Advanced Engineering Mathematics by H.K. Das, S. Chand & Company.
2. Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill).
3. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley Eastern Ltd.

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I/II

BSH102: ENGINEERING PHYSICS

Teaching Scheme		Examination Scheme	
Lectures	4 Hrs/week	Theory	80 Marks
		Class Test	20 Marks
		Duration of Theory paper	3Hrs.

OBJECTIVES:

- The syllabus of Engineering Physics highlights the basic concepts of Physics as applied to all branches of Engineering.
- With the knowledge of Physics , basic principles of Engineering can be understood easily .
- To acquaint students with modern techniques in Physics which can be applied in Engineering field

COURSE CONTENT:

Unit 1: ELECTRON OPTICS AND X-RAYS:

Electron optics – Positive rays-production and properties, Determination of q/m by Thomson's parabolic method, Separation of isotopes by Bain bridge mass spectrograph , Aston's mass spectrograph , Electron refraction - Bethe's Law , Cathode ray oscilloscope – Block diagram ,Cathode ray tube (CRT) , Construction and working- Time base circuit and trigger circuit and applications of CRO.

X- RAYS : Continuous and characteristic spectra, Diffraction of X-rays, Bragg's law, Bragg's X-ray spectrometer, Applications of X-rays, Compton's effect , Derivation for Compton Shift.

(8 Hrs)

Unit 2: OPTICS:

INTERFERENCE - Conditions for stable interference pattern, Theory of wedge shaped film, Appearance of Newton's rings by reflected light , Expression for diameter of dark and bright ring, Engineering applications of interference 1) Determination of wavelength 2)Determination of refractive index of liquid 3)Testing of optical flatness , Michelson's interferometer and it's application for determination of refractive index of thin film.

DIFFRACTION- Diffraction of light , Theory of Plane Transmission grating, Resolving power of diffraction grating .

POLARISATION- Polarization of light , Brewster's law, Plane of vibration , Plane of rotation , Malu's Law, Double refraction in calcite crystal. , Production and detection of plane ,circularly, elliptically polarized light , Optical activity, specific rotation, Laurentz's half shade polarimeter, photo elasticity ,Applications of photoelasticity. **(6 Hrs)**

Unit 3: SUPERCONDUCTIVITY:

Superconductivity-Introduction, critical magnetic field ,Zero resistivity ,Meissner effect, Isotope effect, type –I, type-II superconductor, BCS Theory, applications of superconductor – Josephson junction , SQUID.

Nuclear Physics: Nuclear Fission ,Liquid drop model of nucleus, Chain reaction, Nuclear Reactor, Nuclear Fusion-p-p cycle and C-N cycle, Particle accelerators –The Van de Graff accelerator and Betatron ,Particle detector – G.M. Counter **(6 Hrs)**

Unit 4: SEMICONDUCTORS AND MODERN PHYSICS:

Semiconductors - Introduction , Energy band structure of intrinsic and extrinsic semiconductors, Fermi energy , Fermi – Dirac distribution function , Position of Fermi level in intrinsic and extrinsic semiconductor and its variation with temperature (with derivations), Hall effect, Hall coefficient.

Modern physics – Properties of matter waves , G.P. Thomson's experiment on matter waves , Heisenberg's uncertainty principle, Experimental illustration of uncertainty principle, Schrodinger time dependent and time independent wave equation, physical significance of wave function Ψ.

Atomic structure – Short comings of Bohr's atomic model , Sommerfield relativistic atom model, Vector atom model, Quantum numbers introduced by vector atom model , Zeeman effect – Expression for Zeeman shift. **(8 Hrs)**

Unit 5: THEORY OF LIGHT AND SOUND:

LASER- Properties of LASER , Interaction of radiation with matter ,spontaneous and stimulated emission, Population inversion, Pumping mechanism (three level pumping, four level pumping),Construction and working of Ruby laser and Helium - Neon gas laser,Semiconductor laser , Applications of laser.

Fiber optics-Basic structure and classification of optical fiber, Acceptance angle , acceptance cone ,Numerical aperture, ,applications of optical fiber .

Acoustics - Echo ,Reverberation and reverberation time, Absorption coefficient, Sabine's formula , Acoustical design of a hall, Acoustical materials.

Ultrasonic – Limits of audibility , Properties of ultrasonic waves, Production of ultra sonic waves by piezoelectric & magneto striation method, Determination of wavelength and velocity of ultrasonic waves, Applications of ultrasonic wavers.. **(8 Hrs)**

Unit 6: NANO MATERIALS:

Introduction , Properties of nanoparticles , Synthesis of Nanoparticles – using physical, chemical, and mechanical techniques , Applications of Nanotechnology in various fields such as electronic, automobiles, space and defense , medical, environmental, textile, cosmetics. **(4 Hrs)**

Section A - Unit 1, 2, 3
Section B - Unit 4, 5, 6

TEXT BOOKS:

1. Engineering physics- Gaur and Gupta, S.Chand Publication
2. Engineering physics - Avadhanalu and Kshirsagar, S.Chand Publication

REFERENCE BOOKS:

1. Fundamentals of optics-Jenkins and White, McGraw Hill Publication
2. A Text Book Of Optics – Subrahmanyam, Brijlal, S. Chand Publication
3. Fiber optic Communication- D.C.Agrwal. Wheeler Publication ,New Delhi
4. Fiber optic communication-Keiser. Mc Graw Hill Publication
5. Engineering physics- Hitendra K Malik , A. K. Singh ,Tata McGraw Hill Education Private Limited, New Delhi
6. Essential University Physics – Volume – 1and 2 – Richard Wolfson ,Pearson , Noida
7. Modern Physics – B.L.Theraja – S. Chand and Company Ltd.,Ram Nagar ,New Delhi.
8. Engineering Physics – Dattu R Joshi - Tata Mc-Graw Hill Education Private Limited
9. Nanotechnology, Principles and Practices – Dr. S.K. Kulkarni, Capital Publishing Co., New Delhi.

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester- I / II

BSH103: ENGINEERING CHEMISTRY AND ENVIRONMENTAL SCIENCE

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	Theory	80 Marks
		Class Test	20 Marks
		Duration of Theory paper	3Hrs.

OBJECTIVES:

- The syllabus of Engineering Chemistry and Environmental Science highlights the basic concepts of as applied to all branches of engineering.
- With the knowledge of Engineering Chemistry and Environmental Science, basic principles of engineering can be understood easily.
- To acquaint students with modern techniques in Engineering Chemistry and Environmental Science which can be applied in engineering field

COURSE CONTENT:

Unit 1: Water Technology : Hardness, Types of hardness, Causes of hardness. Chemical analysis of water, Hardness Chloride content, Alkalinity, effects of hard water in steam generation and its preventive measures. Softening of water such as Zeolite Process, Ion Exchange Process, Purification of water, Electro dialysis and Reverse osmosis. (Numerical problem on chemical analysis) **Instrumental Methods of Analysis:** Theory, Instrumental Methods, advantages ,disadvantages and Applications of pH Meter, Conductometry, Potentiometry, Colorimetry **(8 Hrs)**

Unit 2: Chemical Energy Sources : Introduction to energy, fuels, Definition, Classification Calorific Value, Definition, Gross and Net calorific value, determination of calorific value by Bomb Calorimeter, Solid Fuels, Classification, Proximate and Ultimate analysis, problems. Liquid Fuels, Origin of petroleum, composition of petroleum, refining of petroleum, introduction of octane and cetain numbers. Gaseous Fuels, Natural gas, CNG **(6 Hrs)**

Unit 3: High Polymers : Introduction, classification, Polymerization: - Addition Polymerization and Condensation Polymerization with one example. Mechanization Polymerization:- Free Radical mechanism(Ethylene as an example) Plastics, Introduction, Definition, compounds of plastics, types of plastics(thermosetting and thermo softening),synthesis, properties and application of :- Teflon, PMMA, Polyurethane, phenol- formaldehyde resin, Elastomers, Deficiencies in natural rubber, Vulcanization of natural rubber, Synthetic rubber(Buna S and butyl rubber) **(6 Hrs)**

Unit 4: Corrosion Science : Definition, Chemical and electrochemical corrosion and its mechanism, Differential aeration Corrosion (pitting and water line corrosion). Factors Influencing corrosion: - Nature of Metal and Nature of Environment. Corrosion Control, Inorganic Coating: Anodizing and phospheting, Metal Coating: Galvanizing and tinning, Cathodic and Anodic protection.

Lubricants : Introduction, classification, types of lubricants, Lubrication ,Mechanism of lubrication, characteristics of Lubrication such as Viscosity ,V.I., Cloud point and pour point , flash point and fire point ,acid value and aniline point, Selection of lubricants. **(7 Hrs)**

Unit 5: Environmental chemistry : Introduction to environment , segments of environment , types of pollution , air pollution: air pollutants (sources and effects) , Gases (NO_x Sox ,Cox), Particulates (smoke ,fly ash ,smog ,lead,) I.C. engines , ozone layer formation and depletion , acid rain, green house effect , control of air pollution. Water pollution: organic and inorganic pollutants, sewage and its treatment, soil pollution, radioactive pollution, and noise pollution.

(7 Hrs)

Unit 6: Electrochemical Energy System : Conductivity of electrolytes ,specific ,equivalent and molar conductivity , lab determination of molar conductivity ,conductivity cell and cell constant, effect of dilution on ,specific ,equivalent and molar conductivity ,Kohlrausch's law and its applications, Battery Technology, basic concept, classification of batteries, primary, secondary and reserve batteries, Construction, working and application of Acid Storage batteries, Lithium-MnO_2 batteries, Nickel- Metal hydride batteries, Fuel Cells, Construction and working of H_2O_2 and methanol-O_2 Cell. **(6 Hrs)**

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

TEXT BOOKS:

1) A Textbook of Engineering Chemistry by S. S. Dara, S. Chand Publication
2) Engineering Chemistry by Jain & Jain, Dhanpat Rai And Sons

REFERENCE BOOKS:

1) A Textbook of Engineering Chemistry by M.M.Uppal
2) Applied Chemistry by Krishnamurthy. P. Vallinayagam and K. Jeysubramanian TMH Publication
3) A Textbook of Engineering Chemistry by Shashi Chawla
4) A textbook on experiment and calculations in Engineering Chemistry by S. S. Dara, S. Chand Publication
5) Engineering Chemistry by R.V.Gadag and A.N. Shetty
6) Textbook of polymers science by F.W.Billmer, John Wiley and sons.
7) University Chemistry, Mahan, Pearson education

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I

MED104: ENGINEERING GRAPHICS

Teaching Scheme	**Examination Scheme**
Lectures: 2 Hrs/week	Theory: 80 Marks
	Class Test :20 Marks
	Duration of Theory Examination :4 Hrs.

OBJECTIVES:

- *Enhancing imagination, visualization, presentation and interpretation skills*
- *To introduce the student to the universal language and tool of communication of engineers*
- *To make them thorough in understanding and using the various concepts – elements and grammar of Engineering Graphics.*

PURPOSE:

- *Engineering drawing is a formal and precise way of communicating information about the shape, size, features and precision of physical objects*
- *To accurately and unambiguously capture all the geometric features of a product or a component.*
- *Convey all the required information that will allow a manufacturer to produce that component.*

COURSE CONTENT:

(Fundamentals to be taught in Theory classes, Additional practice to be covered in practicals)

Unit 1: Projections of Points and Lines:
Projections of points and Projections of lines inclined to both the reference planes including HT & VT. **(04Hrs)**

Unit 2: Projections of planes:
Planes with surface inclined to both the reference planes. Planes with regular [e.g.:-triangles, squares, rectangle, quadrilateral, pentagon, Hexagon, circle, semicircle. **(02 Hrs)**

Unit 3: Projection, Section and Development of Solids:
Projections of solids with double inclination, Solids like prisms, cylinder, pyramid, cone, sphere, frustum, cube tetrahedron. Projections of geometrical solids cut by cutting planes inclined to one plane, projections of determination of cutting plane angle from the given true shape of section. Development of surfaces of various geometric solids, development of surfaces of cut solids. **(04 Hrs)**

Unit 4: Orthographic and Sectional Orthographic Projection:
Orthographic projections of different machine parts from the given 3D view. Drawing sectional orthographic projections **(04 Hrs)**

Unit 5: Isometric Views:

Introduction to isometric projections isometric and non isometric lines Isometric and non isometric planes isometric projections and Isometric views. **(04 Hrs)**

Unit 6: Machine Parts:

Free hand sketching -- FV and TV of standard machine parts – Hexagonal headed nut and bolt, foundation bolts, shafts, keys, couplings, springs, screw thread forms, welded joints, riveted joints. **(02 Hrs)**

TEXT BOOKS:

1	Elementary Engineering Drawing	N D Bhatt	Charotar Publication House
2	Engineering Drawing	Dhananjay A. Jolhe	Tata McGraw-Hill Education

REFERENCE BOOKS:

1	Engineering Drawing	Mali & Chaudhary	Vrinda P ublishers
2	Engineering Drawing	Basant Agrawal C. M. Agrawal	Tata McGraw-Hill Education
3	Engineering Drawing	M. B. Shah, B. C. Rana	Pearson Education India
4	A Text Book of engineering Graphics	M L Dhabhade	Association of Technical Authors, Pune
5	Engineering Drawing	B. V. R. Gupta, M. Raja Roy	I. K. International Pvt. Ltd
6	A text book of Engineering Drawing	R. K. Dhawan	S. Chand and Co.

PATERN OF QUESTION PAPER:

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

SECTION A

Question no 1 from section A having weightage of 10 marks be made compulsory and two questions from remaining questions be asked to solve each having weightage of 15 marks.

1. Question no. 1. Objective type for 10 marks based on topics from section A.
2. Question no. 2. Projections of line for 15 marks.
3. Question no. 3. Projections of planes for 15 marks.
4. Question no. 4. Projections of solids for 15 marks.
5. Question no. 5. Section and development of the surface of the solids for 15 marks.

SECTION B

Question no 6 from section B having weightage of 10 marks be made compulsory and two questions from remaining questions be asked to solve each having weightage of 15 marks.

6. Question no. 6. Objective type for 10 marks based on topics from section B.
7. Question no. 7. Conversion of Isometric views into Orthographic Projections for 15 marks.
8. Question no. 8. Conversion of Orthographic Projections into Sectional Orthographic Projections for 15 marks
9. Question no. 9. Conversion of Orthographic Projections into Isometric views for 15 marks.
10. Question no. 10. Free hand sketches from chapter Machine Parts, for 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I

EED105: ELEMENTS OF ELECTRICAL ENGINEERING

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	Theory	80 Marks
		Class Test	20 Marks
		Duration of Theory paper	3Hrs.

OBJECTIVES:

- Introduction of Electrical Engineering to the students from all branches of engineering
- To understand the scope of the different fields of Electrical Engineering
- To give understanding of the various elements, devices, machines and processes used in day to day life.
- To make student understand analytical treatment to solve different electrical and magnetic circuits

COURSE CONTENT:

Unit 1: Basic Circuit Elements:
Resistance:- effect of temperature on resistance, resistance temperature, coefficient. (Theoretical treatment only)
Inductance: - self induced e.m.f., mutually induced e.m.f., self inductance, mutual inductance. (Theoretical treatment only)
Capacitance: - charging and discharging, time constant (Elementary mathematical treatment)
(5 Hrs)

Unit 2: Elementary Network Theorems:
Loop analysis, Nodal analysis, Superposition theorem, Thevenin's theorem, Maximum power transfer theorem. (Analysis of simple circuits just to understand applications of theorem)
(9 Hrs)

Unit 3: Magnetic Circuits:
Concept of mmf, flux, flux density, reluctance, permeability and field strength. Simple magnetic circuit, composite magnetic circuit, magnetic leakage and fringing, comparison of electric and magnetic circuits, hysteresis loss, eddy current loss, examples on series magnetic circuits.
(6 Hrs)

Unit 4: A) A.C. Fundamentals:
Generation of alternating emf, rms value, average value, form factor, peak factor, phase relation of voltage and current in pure resistive, inductive and capacitive circuits. (Theoretical treatment only)
(3 Hrs)

B) Single Phase A.C. Circuits:

R-L, R-C, R-L-C series circuit, parallel circuit, impedance triangle, admittance triangle, different powers in A.C. circuit, power factor and it's improvement, series and parallel resonance. (Both theoretical and mathematical treatment) **(6 Hrs)**

Unit 5: Single Phase Transformer:

Construction, working principle, emf equation, transformation ratio, working of transformer on no load and with load, losses, efficiency and voltage regulation.

(Mathematical treatment for direct loading method to find efficiency and voltage regulation) **(6 Hrs)**

Unit 6: Miscellaneous:

Electrical safety importance, precautions and causes of accidents, wiring accessories, types of wiring system, earthing, Wattmeter, Energy meter, Domestic energy conservation tips, non conventional energy sources (solar, tidal, wind etc). **(5 Hrs)**

TEXT BOOKS:

1. A text book of electrical technology Volume-1 by B.L. Theraja & A.K. Theraja, S. Chand & Co.
2. Fundamentals of electrical engineering by Ashfaq Husain, Dhanpat Rai & Co.
3. Basic electrical engineering by V.N. Mittal, Tata McGraw-Hill

REFERENCE BOOKS:

1. Basic Electrical Engineering, Rao, Pearson education

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.

4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I

CED106: ELEMENTS OF CIVIL ENGINEERING

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	Theory	80 Marks
		Class Test	20 Marks
		Duration of Theory paper	3Hrs.

OBJECTIVES:

- Introduction of Civil Engineering to the students from all branches of engineering
- To understand the scope of the different fields of civil engineering
- To give understanding of the various elements, devices, machines and processes used in day to day life.

COURSE CONTENT:

Unit 1: Building Planning and Construction Materials:

Site selection, Plinth area, Carpet area, Floor space Index, Cost of building. Study of properties and uses of different Engineering Materials a) Cement b) Stones c)Aggregates d) Sand e) Bricks f) Concrete g) Steel h) Timber **(5hrs)**

Unit 2: Building and Road Construction:

Loads coming on Structure, Types of construction a) Load bearing structure b) Framed Structure. Functions of Foundation, column footing, combined footing and Machine foundation.

Superstructure and its components: Typical cross section through load bearing wall. Masonry in superstructure and foundation in bricks and rubble, English and Flemish bond in one and a half brick thick wall, construction and precautions to be taken in brick masonry, coursed and uncoursed rubble masonry, construction and precautions to be taken in stone masonry.

Lintels: RCC lintels, cast in situ and precast Concrete Arch lintels.

Doors and Windows: Definitions and technical terms, Location, Sizes, Study of doors and windows in public and residential buildings. Framed and Paneled door, Glazed doors. Casement windows and glazed windows

Stairs: Definitions and technical terms. Requirements of a good stair, Bifurcated stairs and Dog legged stairs. Thumb rules for Rise and Tread.

Floors: Requirements, Selection of flooring Materials, Flag stone and Cement concrete flooring.

Roofs: Requirements of a roof, Lean to roof, Flat R.C.C Roof.

Road Construction: Classification of roads, Rigid and Flexible pavements, typical road section, Camber and function of camber. **(10hrs)**

Unit 3: Earthquake Engineering:

Causes of earth quake, changes in earth crust during earthquake, Technical terms related with earthquake such as Focus, Epicenter, magnitude, intensity and seismograph. Factors affecting damage, consideration of earthquake forces in design, General construction aspects, Earthquake resistant low cost buildings, precautions to be taken before occurrence of an earthquake. **(5hrs)**

Unit 4: Surveying and Leveling:

Principles of survey, measurement of distance by chain and tape, Chaining and Ranging, Direct and indirect ranging, base line and offsets. Equipments: Ranging rods, pegs, Line ranger and Open Cross staff. Bearings, Prismatic compass, Measurement of bearings, calculation of included angles.

Leveling: Terms related to leveling, Benchmarks, Study and use of Dumpy level, leveling staff, determination of reduced levels, Height of Instrument.

(10hrs)

Unit 5: Water Resources Engineering:

Definition of watershed, Necessity of watershed management works. Different structures involved in watershed management. Roof top rain water harvesting and groundwater recharge. Classification of dams, typical section through a gravity dam and zoned earthen embankment. Necessity of irrigation and benefits of irrigation. **(5 hrs)**

Unit 6: Environmental Engineering:

Water demands; design period, per capita demand, Methods of forecasting population: Arithmetic increase, geometric increase and incremental increase method. Treatment flow sheet for a typical water treatment plant, treatment units. Drainage of water from building. Construction of septic tanks and soak pits. **(5hrs)**

TEXT BOOKS:

1	Building Construction	Arora. S.P Bindra S.P
2	Building Construction	B.C.Punmia
3	Highway Engineering	Justo and Khanna
4	Earthquake Engineering	D.S.Joshi
5	Surveying and Leveling (Vol. 1)	B.C.Punmia
6	Water Supply and Sanitary Engineering	G.S Birdi
7	Water Supply and Sanitary Engineering	B.C.Punmia
8	Irrigation Engineering and Hydraulic Structures	Garg S.K
9	Irrigation Engineering and Hydraulic Structures	B.C.Punmia

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I/II

BSH121: LAB I: ENGINEERING PHYSICS

Teaching Scheme		**Examination Scheme**	
Practical	2 Hrs/week	Term work	50 Marks

Term Work:

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.

Minimum ten experiments from the list of experiments as given below

1. e/m by Thomson's method.
2. Determination of radius of curvature of plano- convex lens by Newton's ring.
3. Determination of wavelength by diffraction grating.
4. Resolving power of telescope.
5. Study of CRO (amplitude, frequency, phase measurement).
6. Specific rotation of sugar solution by Laurent's half shade polarimeter.
7. Determination of electronic charge by Millikan's oil drop experiment.
8. Determination of band gap of a semiconductor.
9. Semiconductor diode characteristics. (Ge Si zener LED)
10. Transistor characteristics-CE configuration
11. Study of solar cell characteristics.
12. Study of photocell characteristics.
13. Hall effect and Hall coefficient.
14. Wavelength of laser by diffraction grating.
15. Transistor as an amplifier.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I / II

BSH122: LAB II: ENGINEERING CHEMISTRY AND ENVIRONMENTAL SCIENCE

Teaching Scheme		**Examination Scheme**	
Practical	2 Hrs/week	Term work	50 Marks

COURSE CONTENT

At least ten experiments out of the following experiments are to be performed.

LIST OF EXPERIMENTS:

1. Study of effect of dilution on conductivity and determination of cell constant
2. Conductometric titrations with acid-base, mixture of acids-base, precipitation.
3. Determination of hardness of water by EDTA.
4. Determination of pH values of solutions by indicators, pH papers and pH meter.
5. To study the different factors affecting rate of electro-chemical corrosion.
6. Determination of free chlorine in water in water sample.
7. Determination of dissolved oxygen in water sample.
8. Determination of viscosity of liquid by Ostwald/ Redwoods Viscometer.
9. Determination of acid value of lubricating oil.
10. Preparation of phenol formaldehyde plastic.
11. Determination of molecular weight of polymer.
12. .Preparation of Urea formaldehyde resin.
13. Determination of Aniline point of a lubricating oil
14. Determination of acid value of plastic material.
15. Determination of percentage of ash.
16. Determination of percentage of moisture.

TERM WORK

Term work shall consists of the write up on the experiments carried out during the course (at least ten) which should include aim, procedure, neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment.

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I

MED123: Lab III: Engineering Graphics

Teaching Scheme		**Examination Scheme**	
Practicals	4 Hrs/week	Term work	50 Marks

OBJECTIVES:

- Understanding Spacing,
- Understanding Scales, and Sizes of drawings
- Understanding methods of Standard Dimensioning,
- Technical lettering
- Use of different lines with varying thickness and darkness,

TERM WORK Term work shall consist of compilation of A2 (594x420mm) (Half imperial) size drawing sheets as detailed below

Sheet No. 1: PROJECTIONS OF LINES: To draw at least four problems based on line inclined to both the planes, with following objectives,

1. Obtaining projections of line inclined to both the planes,
2. Determination of true length and inclinations of the line,
3. Locating traces of line, and its use for obtaining true length and inclination of the line.

Sheet No. 2: PROJECTIONS OF PLANES: To draw at least four problems based on planes with double inclinations, with following objectives,

1. Obtaining projections of planes of different (polygonal, circular, semicircular etc.) shapes, having double inclinations.
2. Determination of true shape and inclinations of the plane.

Sheet No. 3: PROJECTIONS OF SOLIDS: To draw at least four problems based on solids with double inclination, with following objectives,

1. Obtaining projections of different regular geometrical solids, having double inclinations.
2. Understanding and showing hidden edges of the solids,
3. Determining the inclination of the axis of the solid,
4. Obtaining apparent inclinations in FV/TV.

Sheet No. 4: SECTION AND DEVELOPMENT OF SOLIDS: At least two problems to be solved on each, section of solids and development of surfaces, with following objectives,

1. Drawing section line view of the cutting plane in correct view,
2. Drawing sectional view, and true shape of section,
3. Determining inclination of the cutting plane and for the given true shape.
4. Drawing the development of the cut solid,
5. Drawing the FV and TV from the given development.

Sheet No. 5: ORTHOGRAPHIC AND SECTIONAL ORTHOGRAPHIC PROJECTION: At least two problems to be solved on each, orthographic projections and sectional orthographic projections, with following objectives

1. Reading the 3D drawings and converting it in 2D views.

Sheet No. 6: ISOMETRIC VIEWS: Solving at least three problems for isometric views, and one for isometric projection for simple machine parts with following objectives,

1. Reading the 2D drawings and converting it in 3D views.

Sketch Book: A sketch book to be prepared by the students containing at least 20 objective type thought evoking, questions based on entire syllabus and Free hand sketches based on the Machine Parts syllabus.

Assessment of termwork shall be carried out by a pair of the examiner, one shall be the subject teacher and another appointed by the university.

Note: "Teachers teaching Engineering Graphics of the institute are required to plan the assignments to be covered in practicals well in advance in consultation with the Head of the Department."

"Efforts are required for enhancing the line work, lettering, and presentation skills of the students during practical sessions".

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

EED124: LAB IV ELEMENTS OF ELECTRICAL ENGINEERING

Teaching Scheme		**Examination Scheme**	
Practical	2 Hrs/week	Term work	50 Marks

TERM WORK:

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. (Minimum eight experiments from the list of experiments as given below)

List of Experiments:

1. Study of house & stair case wiring.
2. Study of multimeter.
3. Study of Lamps.
4. Effect of temperature on resistance.
5. Verification of Superposition theorem.
6. Verification of Thevenin's theorem.
7. Study of R-L / R-C series circuit. (Measurement of current and it's verification theoretically)
8. Measurement of single phase power.
9. Verification of transformation ratio.
10. Determination of efficiency of single phase transformer.

Assessment of termwork shall be carried out by a pair of the examiner, one shall be the subject teacher and another appointed by the university.

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

CED125: LAB V: ELEMENTS OF CIVIL ENGINEERING

Teaching Scheme		**Examination Scheme**	
Practical	2 Hrs/week	Term work	50 Marks

Term Work:

Term work shall consist of sketches on ¼ imperial size sheets. (Minimum 15 sketches)

1	Foundation Types	2 Sketches
2	Stone Masonry(Coursed and Un coursed Rubble Masonry)	2 Sketches
3	Brick Masonry(English and Flemish Bond one and half brick thick)	2 Sketches
4	Doors: Paneled and Glazed Doors	2 Sketches
5	Windows: Paneled and Glazed	2 Sketches
6	Stairs: Bifurcated and Dog legged	2 Sketches
7	Floors: Flag Stone and Cement Concrete Flooring	2 Sketches
8	Roofs: Lean to roof and Flat R.C.C roof	2 Sketches
9	Machine Foundation	1 Sketch
10	Section through wall	1 Sketch
11	Flow diagram of conventional water treatment plant	1 Sketch
12	Typical section through a concrete gravity dam	1 Sketch
13	Chain and Compass Survey	1 Sketch
14	Practical use of Dumpy Level	1 Sketch

Assessment of termwork shall be carried out by a pair of the examiner, one shall be the subject teacher and another appointed by the university.

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-I

MED126: Lab VI: WORKSHOP PRACTICE –I

Teaching scheme: practical 2 hours/week **Examination scheme:** Term work **50** marks.

OBJECTIVES:

- Introduction of Workshop Practices.
- To give an on-hand practice to the students to handle the different tools on the shop floor. To get acquainted with the different processes and should be able to select the appropriate process.

PURPOSE:

- To obtain desired shapes and forms of jobs using the basic hand working and joining processes.
- Convey all the information that will be helpful for understanding of different processes used on the shop floor.

COURSE CONTENT:

Preparation of jobs in each section individually by the student. The student must learn to handle the different tools and equipments. He must also learn all the safety precautions and follow them.

1. **Fitting:** Study of all fitting tools, files and purpose of fitting. Prepare a job individually involving various fitting operations and joints.
2. **Joining processes**: Study of welding equipments and techniques, edge preparation, filler metals, fluxes. Prepare one job having lap, butt and angle joints using arc welding and one joint each by gas welding or brazing. Demonstration of spot welding operation.
3. **Black Smithy**: Study of all smithy tools and smithy operations. Preparation of one job individually by each student involving cutting, change of cross section, bending. It may be like change of round to square section and taper, 'S' hook, chain link , round ring or any job involving simple operations.

Term work shall consist of submission of above jobs along with a file containing write up on the principle of the process, description of different tools used in fitting, welding and black smithy and a workshop diary in general format which should have the record like job drawing, tools used, operations to be performed on the job. This should be certified by the concerned section in-charge with the record of number of sessions attended along with starting and completion date of the job.

Assessment of the Term work shall be done by two teachers appointed by the Head of the institute, one of them shall be Workshop Superintendent

Recommended Books:

1) Workshop Technology, vol I, by Hazra Chaudhury; Media Promotors & Publication
2) Workshop Technology, vol I, by B. S. Raghuvanshi; Dhanpatrai and Sons.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

BSH151: ENGINEERING MATHEMATICS II

Teaching Scheme		**Examination Scheme**	
Lectures	4 Hrs/week	Theory	80 Marks
Tutorial	1 Hr/week	Class Test	20 Marks
Batch size for tutorial	Max 30 students/batch	Duration of Theory paper	3Hrs.

OBJECTIVES:

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.

Unit 1:

Reduction formulae

Reduction formulae for $\int_0^{\frac{\pi}{2}} \sin^n x \, dx$, $\int_0^{\frac{\pi}{2}} \cos^n x \, dx$, [ ],Beta and Gamma functions, Relation between Beta and Gamma functions. **(6 Hours)**

Unit 2:

Multiple Integrals: Double integration in Cartesian & polar coordinates, Evaluation of double integrals by changing the order of integration and changing to polar form, triple integration.

(7 Hours)

Unit 3:

Applications Of Integral Calculus: To find Area by double integration, Surface Area & Volume of Solid of Revolution.

Introduction of solid geometry: sphere, cone, cylinder (There should not be any question on solid geometry) Volume by triple integration, Mean value of function, Root Mean Square Values**.** **(7 Hours)**

Unit 4:

Fourier series: Definition, Dirichlet's conditions, Full Range Fourier Series on $C \leq x \leq C+2L$, Fourier series for Even and Odd functions over the $-L \leq x \leq L$, Half Range Fourier series over the $0 \leq x \leq L$.

(10 Hours)

Unit 5:

Matrices-I: Rank of a matrix, Normal form of a matrix, Consistency of the system of linear equations (homogeneous and non homogeneous equations). **(5 Hours)**

Unit 6:
Matrices-II: Characteristic equation of Matrix, Eigen values and Eigen vectors, Cayley-Hamilton Theorem, Linear dependence and independence of vectors, Linear Transformations. Reduction of Quadratic form to Canonical form. **(5 Hours)**

Note: All Theorems are without proofs

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

TEXT BOOKS:

1. A Text Book of Engineering Mathematics (Volume-I, II), P. N. Wartikar and J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
2. Higher Engineering Mathematics by B. S. Grewal, Khanna Publications, New Delhi.

RECOMMENDED BOOKS:

1. Advanced Engineering Mathematics by H.K. Das, S. Chand & Company.
2. Higher Engineering Mathematics by B.V. Ramana (Tata McGraw-Hill).
3. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley Eastern Ltd.
4. Engineering Mathematics by Babu Ram, PEARSON
5. Engineering Mathematics A Tutorial Approach by Ravish R Singh, Mukul Bhat ,Mc Graw Hill

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.

4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

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FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

CED152: ENGINEERING MECHANICS

Teaching Scheme		**Examination Scheme**	
4 Hrs/week	Theory	80 Marks	●● ● Class Test● 20 Marks● ●● ● Duration of Theory paper

Duration of Theory paper 3Hrs.

●

OBJECTIVES:

- Introduction of Civil Engineering to the students from all branches of engineering
- To understand the scope of the different fields of civil engineering
- To study fundamentals and to impart knowledge about role of statics and dynamics

COURSE CONTENT:

1. Force System: Force System: 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. **(9 Hrs.)**

2. Friction and Properties of Plane Surfaces:

Friction: Basic definitions, Laws of Friction, Cone of Friction, Angle of repose, Limiting Equilibrium for bodies under force systems (Block, Wedge-Block and Ladder only).

Centre of Gravity and Moment of Inertia: Derivation of CG and MI of standard shape of lines, plane Lamina, Radius of Gyration, Parallel and Perpendicular Axis Theorem. **(6 Hrs.)**

3. Plane Trusses and Virtual Work:

Plane Trusses: Analysis of pin jointed plane Trusses by Method of Joint, Method of Section.

Virtual Work: Principe of Virtual Work, Application to Single Span Simply Supported Beams only.

(5 Hrs.)

4. Kinematics of Particle and Rigid Body:

Kinematics of Particles: 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, concept of Relative Velocity and Resultant Velocity (No Numerical to be set).

Kinematics of Rigid Bodies: Plane motion of particles and connected bodies, Linear Motion, Translation, Combined Linear and Translation Motion, ICR. **(10 Hrs.)**

5. Kinetics of Particle and Rigid Body:

Kinetics of Particles: Linear Motion of Particles and Connected Bodies.

Kinetics of Rigid Bodies: Rotational motion, Rolling without slipping, D'Alemeberts Principle, Impact and Impulse **(6 Hrs.)**

6. Work, Power, Energy:

: Work-Energy relation for Particles and Rigid Bodies **(4 Hrs.)**

TEXT BOOKS:

1) Applied Mechanics(Statics and Dynamics) : Beer and Johnston
2) Engineering Mechanics: R. K. Bansal
3) Engineering Mechanics: B. Prasad
4) Applied Mechanics: S. Ramamurtham
5) Engineering Mechanics: R. C. Hibbeler, Ashok Gupta
6) Engineering Mechanics: Irving H. Shames, G. Krishna Mohan Rao

REFERENCE BOOKS:

1) Engineering Mechanics: Nelson and Mclean
2) Engineering Mechanics: Singer

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

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FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

MED153: ELEMENTS OF MECHANICAL ENGINEERING

Examination Scheme	•Lectures• 4 Hrs/week	4 Hrs/week	Theory
	Lectures		
		Class Test	20 Marks
		Duration of Theory paper	3Hrs.

OBJECTIVES:

- Introduction of Mechanical Engineering to the students from all branches of engineering
- To understand the scope of the different fields of Mechanical Engineering such as Power, Design and Production.
- To give understanding of the various devices, machines and processes used in day to day life.

COURSE CONTENT:

Unit 1: Fundamentals of thermodynamics: Introduction to Mechanical Engineering. Scope and brief idea about various fields of Mechanical Engineering such as Power, Design and Production.

A) Thermodynamic system, types of systems, working substance, thermodynamic planes, thermodynamic work; Thermodynamic properties, state, state function, path function, process and cycles, thermodynamic equilibrium; Zeroth law of thermodynamics; Temperature, Pressure and their measurement; Form of energy, work transfer, Pdv work, other forms of work.; Heat transfer, specific heat, sensible heat, latent heat, entropy, modes of heat transfer; First law of thermodynamics, Joule's experiment, First law applied to closed system, open system, SFEE, different statements of the First law. (No numerical treatment expected)

B) Ideal gas as working substance, Boyle's law, Avogadro's law, equation of state of an ideal gas, specific and universal gas constant; Concept of constant pressure, constant temperature, constant volume, adiabatic, polytropic processes and their representations on P-V and T-S diagrams. (Simple elementary numericals only on individual process and not on cycles) (**10 Hrs)**

Unit 2: Thermal machines: Introduction of IC engine as a power developing device; Working principle of two and four stroke engines, difference between petrol and diesel engines, brief introduction to MPFI and CRDI systems; Working principle and applications of Gas turbine, Steam Turbine, Compressor, Domestic refrigerator, Air conditioner (Description with block diagrams). (No numerical treatment expected) **(6 Hrs)**

Unit 3: Energy sources: Renewable and non renewable energy sources, Principle of working, applications advantages and limitations of. Thermal and Nuclear Power Plants (only block diagram and brief description). **(05 Hrs)**

Unit 4: Power transmission elements and drives: Introduction; Working principle construction and applications of axle, spindle, coupling, bearing, single plate friction clutch, brakes; belt drive, pulleys,chain drive; Gear drive: Introduction. Types of gears, terminology of spur gear, velocity ratio, geometric relation.(Simple numericals on gear drive like calculation of no of teeth, diameter etc.) **(05 Hrs)**

Unit 5: Engineering materials: Introduction to engineering materials and their applications; Classification of materials, mechanical properties, selection criteria for material selection; Basic heat treatments for change in property of materials: Normalizing, Annealing, Hardening, Case Hardening, Tempering (Only introductory treatment). **(04 Hrs)**

Unit 6: Manufacturing processes: Introduction, classification of manufacturing processes like Primary shaping processes, secondary processes, material removal processes, joining processes, non conventional machining processes. (Only classification). Principle of working and applications of casting, hot forging, cold forging, Hot rolling, Cold rolling and Extrusion. Welding: Introduction of soldering, brazing, shielded metal arc welding and resistance welding (only spot welding), their applications. (Simple schematic diagrams showing their working principles).

Machining processes: Classification of machine tools; Working principle, block diagram, main parts (The main control parts name and purpose or function only, details not to be dealt in depth) and operations carried out on the machine (schematic diagram and brief explanation) such as centre lathe, drilling machine, milling machine and grinding machine. **(10 Hrs)**

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

TEXT BOOKS:

3) Engineering Thermodynamics by P.K.Nag, Tata Mcgraw Hill publication
4) Theory of machine and Mechanisms, by P.L.Balaney; Khanna Publications
5) Material Science and Metallurgy, Dr.V.D.Kotgire; Everest Publishing House.
6) Workshop Technology, Vol I & II, by Hazra Chaudhury; Media Promotors & Publishers

REFERENCE BOOKS:

8) Thermal Engineering by P.L.Balaney; Khanna publication.
9) Non-Conventional Energy Resources, by B. H. Khan; Tata Mcgraw Hill publication.
10) Machine Design by R.S.Khurmi; S. Chand and Company Ltd
11) Theory of Machines by RS Khurmi and J, K. Gupta; S.Chand and Company Ltd.
12) Workshop Technology, vol I & II by B. S. Raghuvanshi; Dhanpatrai and Sons.
13) Manufacturing Process for Engineering Materials, Kalpak Jain, Pearson Education

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. 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 having weightage of 10 marks each be

made compulsory and should have at least eight bits of two marks out of which five to be solved.

4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

EXD154: ELEMENTS OF ELECTRONICS AND COMPUTER ENGINEERING

Examination Scheme	• Lectures• 4 Hrs/week Lectures	4 Hrs/week	Theory
		Duration of Theory paper	3Hrs.

OBJECTIVES:

- Introduction of Electronics and Computer Engineering to the students from all branches of engineering
- To understand the scope of the different fields of Electronics & Computer Engineering.
- To study different case studies for better understanding the subject
- To learn basics of programming
- To develop logic for solving simple application

COURSE CONTENT: ELEMENTS OF ELECTRONICS:

Unit 1: Study of Electronic Components:

Study of Resistor, Types of Resistor and their construction, Color Coding of Resistor,
Study of Capacitors, Types of Capacitors and their construction,
Study of Various types of Inductors (Air core, Ferrite Core etc.).
Study of Semiconductor Devices such as Diode, Transistor, SCR, Diac, Triac, IGBT, MOSFET, JEFET- Construction, Working and Applications.
Optoelectronics Devices: - LED, LED, Case study of MET2E Opt- coupler with data sheet & Applications **[08 Hrs]**

Unit 2: Voltage Regulation:

Definition of rectifier, Need of rectifier, Types of rectifiers, Filters and their types. Block diagram of Voltage regulator, Zener diode as a voltage regulator, Transistorized Voltage regulator, Three terminal Voltage regulator such as IC 78XX, IC79XX. Adjustable Voltage Regulator using LM317. **[06 Hrs]**

Unit 3: Digital Electronics:

Number System :- Decimal, Binary, Octal, Hexadecimal & their conversions. Binary addition, subtraction, 2'S complement method for binary subtraction

Logic Gates: - Study of Basic logic gate, Universal Logic Gate and their truth table.
Boolean Algebra: - Study of Boolean theorems , De-Morgan's Theorem
Case Study: - IC 7400, IC 7406 – Study of data sheet & Electrical Characteristics. **[06 Hrs]**

COURSE CONTENT: COMPUTER ENGINEERING:

Unit 4: Introduction to C:

Historical development of C, Importance of C, writes an algorithm, drawing flowchart, basic structure of C program. Creating a simple C program, executing a C program, why to include header files? Character set, keywords & identifiers. Constants and variables, data types, declaration of variables, defining symbolic constants, Arithmetic operators, relational operators, Logical , assignment, increment and decrement operators, conditional operators, library functions, arithmetic expressions, evolution of expressions, precedence and associativity of operators. **[06 Hrs]**

Unit 5: Data Input Output, Decision Control and Loop Control Structure:

Reading a character, writing a character, formatted input and output. Decision Control structure, if statement, if-else statement, nested if-else, Switch statement, goto statement. While loop, for loop, break, continue, do-while loop. . **[08 Hrs]**

Unit 6: Arrays and Functions:

One dimensional array, two dimensional array, Linear Search, Bubble sort, Defining a function, function prototype, return type, Passing arguments, call by value and call by reference, Recursion. **[06 Hrs]**

Section A: Unit 1, 2, 3
Section B: Unit 4, 5, 6

TEXT BOOKS:

1) Principles of Electronics by V.K.Mehta, S. Chand Publications, New Delhi
2) Modern Digital Electronics By R.P.Jain, TMH Publications
3) Linear Integrated Circuit and Op-Amp by Ramakant Gaikwad, PHI Publications
4) Basic Electronics by B.L. Thareja, S. Chand Publications, New Delhi
5) "Let us C" by Yashvant Kanetkar, BPB Publication.
6) "The C Programming Language" by Dennis Ritchie, Brian W Kernighan, PHI Publication.

REFERENCE BOOKS:

1) Basic Electronics by Debasis De , Pearson Publications,New Delhi
2) Basic Electronics by R.D. Sudhaker Sanuel, Pearson Publications,New Delhi
3) Integrated Electronics by Millman Halkies , PHI Publications.
4) "C Programming: Test your skills" by A. N. Kamthane, Pearson Publication.
5) "C Progminning" by Mike McGrath, Mc Graw Hill Publication.

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part i.e. based on Element of Electronics Engineering and Section B questions on second part i.e. based on Computer Engineering Question paper should cover the entire syllabus.

For 80 marks Paper:

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 having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

FIRST YEAR ENGINEERING

Semester-II

MED171: LABVII: ELEMENTS OF MECHANICAL ENGINEERING

Teaching Scheme		**Examination Scheme**	
Practical	2 Hrs/week	Term work	50 Marks

TERM WORK:

Term work shall consists of the write up on the experiments carried out during the course (at least seven) which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment . Compulsory assignments based on the chapter1, 2 and 3, of the subject Elements of Mechanical Engineering (MED153) given by the teacher, which should cover the overall study, not exceeding 5 topics in each assignment.

LIST OF EXPERIMENTS:

17. **Study of I.C. Engines**. Construction and working of two stroke and four stroke petrol and diesel engine. Demonstration of the working engines. Cut section models be shown to understand the details.
18. **Study of refrigeration system**. Study of the refrigeration cycle used in the household refrigerator, its actual construction and working.
19. **Study of compressor**. Study of a reciprocating compressor with reservoir, its accessories
20. **Study of drives**. Belt drive, chain drive and gear drive is expected to be studied. Different components of these drives. Study of chain, types of belts and gears, their drive ratio and their application must be clearly understood.
21. **Study of clutch**. Function of clutch, types of clutches and its application. Construction and working of a single plate friction clutch be studied in details.
22. **Study of brakes**. Construction, working and applications of different types of brakes.
23. **Study of drill machine**. Study and demonstration of a simple pillar drill machine. Demonstration of various simple operations performed on a drilling machine.
24. **Study of lathe machine**. Study of centre lathe and its various main parts. Demonstration of various simple operations performed on a lathe machine.
25. **Study of milling machine**. Study of a milling machine and its various main parts. Demonstration of various simple operations performed on a milling machine.
26. **Study of grinding machine**. Study of surface grinder (horizontal or vertical axis) and its various main parts. Demonstration of various simple operations performed on a grinding machine.

Assessment of termwork shall be carried out by a pair of the examiner, one shall be the subject teacher and another appointed by the university.

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FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

CED172: LAB VIII: ENGINEERING MECHANICS

Teaching Scheme		**Examination Scheme**	
Practical	2 Hrs/week	Term work	50 Marks

TERM WORK:

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

Part I: Graphical Solutions: (Two problems each)

1) Resultant of Concurrent and Non- Concurrent coplanar Force System.

2) Beam Reaction.

3) Analysis of Pin-jointed Trusses(only one problem)

4) Friction

Part II: Laboratory Experiments: (Any Four)

1) Parallelogram Law of Forces.

2) Lami's Theorem.

3) Beam Reactions.

4) Member Forces in Trusses.

5) Jib Crane.

6) Moment of Inertia of Fly Wheel.

7) Simple Screw Jack.

8) Differential Axle and Wheel.

9) Inclined Plane – Limiting Equilibrium.

Assessment of termwork shall be carried out by a pair of the examiner, one shall be the subject teacher and another appointed by the university.

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

EXD 173: LAB IX: ELEMENTS OF ELECTRONICS AND COMPUTER ENGINEERING

Teaching Scheme		Examination Scheme	
Practical	2 Hrs/week	Term work	50 Marks

ELEMENTS OF ELECTRONICS:

List of Practicals:

1. Study of Various components (Active and Passive) - Diode, Transistor, SCR, Diac, Triac, IGBT, MOSFET, JEFET, Resistors , Capacitors
2. Study and to construct Half wave, Full wave and Bridge Rectifier on bread board
3. Study and to construct Half wave, Full wave and Bridge Rectifier with Shunt Capacitor and Pi-type Filter and observe the output/input wave forms.
4. To construct three terminal voltage regulator (Dual Power Supply) using IC 7805,IC 7905 on bread board.
5. Study of basic Logic gates such as AND, NOT, OR gate. (Use the appropriate IC to perform on bread board)
6. To perform Zener diode as a voltage regulator.
7. To perform Adjustable Voltage regulator using IC LM317.

1. Perform any six practicals out of above list

2. Students are not allowed to perform practical on readymade kits (Physical connections with circuit on breadboard is must)

COMPUTER ENGINEERING:

1. Program to find the sum of individual digits in an integer.
2. Program to find largest of three numbers.
3. Program to find the roots of Quadratic equation.
4. Program to check whether the number is prime or not.
5. Program to generate the specified mathematical series.
6. Program to perform addition of two matrices.
7. Program to search element from given array.
8. Program to sort given numbers in ascending or descending order.
9. Program to find factorial of given number using function.

Term work shall consists of the write up on 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 (at least six from Elements of Electronics and eight programs from Computer Engineering).

Assessment of termwork shall be carried out by a pair of the examiners from each Electronics and Computer Engineering, one from each Electronics and Computer Engineering shall be the subject teacher and another appointed by the university.

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FACULTY OF ENGINEERING AND TECHNOLOGY

First Year Engineering

Semester-II

MED174: LAB X: WORKSHOP PRACTICE –II

Teaching scheme: practical 2 hours/week **Examination scheme:** Term work **50** marks.

OBJECTIVES:

- Introduction of Workshop Practices.
- To give an on-hand practice to the students to handle the different tools on the shop floor. To get acquainted with the different processes and should be able to select the appropriate process.

PURPOSE:

- To obtain desired shapes and forms of jobs using the basic hand working processes.
- Convey all the information that will be helpful for understanding of different processes used on the shop floor.

COURSE CONTENT:

Preparation of jobs in each section individually by the student. The student must learn to handle the different tools and equipments. He must also learn all the safety precautions and follow them.

1 **Carpentry:** Study of carpentry tools, carpentry operations and different joints. Preparation of a job involving any two carpentry joints. One on wood turning lathe.

2 **Plumbing**. Study of plumbing tools, pipe accessories and pipe joints. Cut threads on a pipe using pipe die set. Check its fitment on the connection.

3 **Tin Smithy**. Study of tin smithy tools and development of surfaces. Preparation of one job by each student involving development of surface and various tin smithy operations like marking, cutting, bending/folding, making a joint, riveting etc.

Term work shall consist of submission of above jobs along with a file containing write up on the principle of the process, description of different tools used in carpentry, plumbing and tin smithy and a workshop diary in general format which should have the record like job drawing (and development of surface of tin smithy job), tools used, operations to be performed on the job. This should be certified by the concerned section in-charge with the record of number of sessions attended, starting and completion date of the jobs.

Assessment of the Term work shall be done by two teachers appointed by the Head of the institute, one of them shall be Workshop Superintendent.

Recommended Books:

1) Workshop Technology, vol I, by Hazra Chaudhury; Media Promotors & Publication

2) Workshop Technology, vol I, by B. S. Raghuvanshi; Dhanpatrai and Sons.