COLLEGE OF ENGINEERING

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING

(AUTONOMOUS)

MADHURAWADA, VISAKHAPATNAM-530048

AFFILIATED TO JNTU KAKINADA

CIVIL ENGINEERING

REGULATIONS, COURSE STRUCTURE AND SYLLABI FOR B.TECH. (I TO VI SEMESTERS) UNDER AUTONOMOUS STATUS

ALL BRANCHES ARE ACCREDITED BY **NBA** OF AICTE

ACCREDITED BY **NAAC** WITH '**A**' GRADE WITH A **CGPA** OF **3.47**/4.00

2011 - 2012

Prof. Allam Appa Rao, Vice Chancellor, JNTU-K launching the Autonomous System at Gayatri Vidya Parishad College of Engineering

Meeting of the Academic Council held on 15th May 2011

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CIVIL ENGINEERING

REGULATIONS, COURSE STRUCTURE AND SYLLABI FOR B.TECH.

CHEMICAL ENGINEERING

UNDER AUTONOMOUS STATUS

(I TO VI SEMESTERS)

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Vision

To evolve into and sustain as a Centre of Excellence in Technological Education and Research with a holistic approach.

Mission

To produce high quality engineering graduates with the requisite theoretical and practical knowledge and social awareness to be able to contribute effectively to the progress of the society through their chosen field of endeavour.

To undertake Research & Development, and extension activities in the fields of Science and Engineering in areas of relevance for immediate application as well as for strengthening or establishing fundamental knowledge.

F O R E W O R D

The G.V.P. College of Engineering has successfully completed two years of Autonomy and entered into third year with great confidence and vigor. The procedures and methods adopted in implementing the autonomy has drawn admiration from other institutes of same status.

At each step, a systematic feed back is taken from all the stake holders which helped to fine tune the academic activities so that the teaching learning process is more effective.

The support and encouragement from academicians from institutes of repute from within and outside the state in the form of members on the BOS, paper setters, valuers and other types of involvement has led us to maintain the standards. The moral support and encouragement from parent University gave a boost to march forward with great enthusiasm.

The regulations and course structure are reviewed and some flexibilities and modifications are incorporated to make the slow learners catch up with the rest. The syllabi for 5th ,6th semesters is also prepared in the third meeting of the Board of Studies and approved by the Academic Council for implementation.

The students are advised to make the best use of the available resources and strive hard to achieve laurels on the personal as well as institutional levels.

On behalf of the Management and staff a warm welcome is extended to the new incumbents assuring a healthy academic environment.

Principal

COURSE STRUCTURE

ACADEMIC REGULATIONS

(EFFECTIVE FOR 2011 ADMITTED BATCH)

R 1.0 Qualification for Admission and duration:

R1.1 The selection for category A and B seats shall be as per Govt. of Andhra Pradesh rules.

R1.2 The duration of the programme for the Degree of Bachelor of Technology will be four academic years, with two semesters in each year. However if a student cannot complete within 4 years, he can do so by taking more time but not more than 8 years.

R1.3 The duration of each semester will normally be 20 weeks with 5 days a week. A working day shall have 7 periods each of 50 minutes.

R 2.0 Structure of the Programme :

Semester	No.of Courses per semester	Credits
	Theory + Lab	
I	5 + 3	26
II	5 + 3	26
III	6 + 2	28
IV	6 + 2	28
V	6 + 2	28
VI	6 + 1+	28
Advanced Communication skills Lab (V/VI semesters)		
Industry oriented Mini Project		02
VII	6(Two electives) + 2	28
VIII	3(Two electives) + Seminar + Comprehensive Viva +Project	30
Total		**224**

Note: Except elective subjects in VII, VIII semesters all courses are compulsory.

a) The curriculum in the first and second semesters shall be common for all the B.Tech. programmes except for Departmental options.

b) Each course is normally assigned a certain number of credits as follows:

- 1 credit per lecture period per week and no credits for tutorials
- 2 credits per laboratory class of 3 periods per week
- 2 credits for Industry oriented Mini Project
- 2 credits for Seminar with 3 periods per week
- 4 credits for comprehensive viva-voce examination
- 12 credits for project work

c) The curriculum for any programme of study shall have a total of 224 credits out of which a minimum of 216 credits are required to be obtained by a student for the award of B.Tech degree. The default of 8 credits is permitted only from the electives in VII and VIII semesters.

d) Participation in extra- and co-curricular activities like Sports, Social Service, Cultural and Literary associations is compulsory for all the students as and when they are planned.

i) A student has to record a participation of minimum of 32 hours in his/her chosen activity during the first year.

ii) The activities are monitored and grades are awarded as given below:

EXCELLENT
GOOD
SATISFACTORY
UNSATISFACTORY

If a candidate gets an unsatisfactory Grade, he/she has to repeat the above activity.

R 3.0 Method of Evaluation :

The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks each for theory and practical/Drawing subjects. In addition, Industry oriented mini-project, seminar, Comprehensive Viva-Voce and Project work shall be evaluated for 50, 50, 100 and 200 marks, respectively.

R 3.1 Theory :

For all lecture based theory courses, the evaluation shall be for 40 marks through internal evaluation and 60 marks through external end-semester examination of three hours duration.

R 3.1 a. Internal evaluation :

The 40 internal marks are divided as 20+10+10.

1.	Quiz/Subject type test	20 marks
2.	Assignment/tutorial	10 marks
3.	Seminar/Viva/ Any other method as notified by the teacher (at the beginning of the semester)	10 marks

The internal marks shall be computed as per the procedure given above, as the weighted average of the two internal evaluations at 2:1 with the higher score carrying a weightage of 2.

R 3.1 b. External evaluation :

The question paper shall be set externally and valued both internally and externally.

If the difference between the first and second valuations is less than or equal to 15% of the maximum of the paper the better of the two valuations shall be awarded and if the difference between the first and second valua-

tion is more than 15%, the chief examiner appointed has to discuss with the two valuers and have his own assessment of the script. The marks given by the chief examiner shall be final for award.

R 3.2 Practicals :

Practicals/drawing shall be evaluated for 100 marks, out of which 50 marks are for external examination and 50 marks are for internal evaluation. The 50 internal marks are distributed as 25 marks for day-to-day work and 25 marks for internal end-examination. The internal end- examination shall be conducted by the teacher concerned and another faculty member of the same department.

10 out of 12 to 16 experiments/exercises recommended are to be completed in a semester.

R 3.3 Industry Oriented Mini Project :

The industry oriented mini project shall be carried out during the summer break for a minimum of 4 weeks after the VI Semester and completed before the start of the VII semester. A report has to be submitted at the beginning of the VII semester for assessment by an internal evaluation committee comprising Head of the Department and two faculty of the department including the project Supervisor for 50 marks. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

R 3.4 Seminar :

The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty Supervisor. The other component is suggested by the Supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on Seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before a committee comprising the Head of the Department, seminar

supervisor and a senior faculty of the department. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

R 3.5 Comprehensive Viva-Voce :

The comprehensive Viva-Voce will be conducted by a committee comprising Head of the Department, two senior faculty of the respective department and an External Examiner from outside the College. This is aimed at assessing the student's understanding of various subjects studied during the entire program of 4 years. The Comprehensive Viva-Voce shall be evaluated for 100 marks at the end of VIII semester. A minimum of 50% of maximum marks shall be obtained to earn the corresponding credits.

R 4.0 Project :

The Project work shall be spread over the entire VIII Semester and of somewhat innovative in nature, exploring the research bent of mind of the student. A project batch shall comprise of not more than four students. A mid-course review is conducted by HOD and the Supervisor on the progress for 20% of the marks. On completion of the project a second evaluation is conducted for award of internal marks of another 20% before the report is submitted making the total internal marks 40%. The final evaluation shall be based on the report submitted and a viva-voce exam for 60% marks by an external examiner.

R 5.0 Attendance Requirements :

It is desirable for a candidate to put up 100% attendance in the class in all the subjects. However, a candidate shall be permitted to appear for the end semester examination provided he records a minimum of 75% attendance for each subject in any semester. However, condonation for shortage of attendance may be given on Medical grounds, if a certificate

to the extent is submitted to the HOD when the candidate first returns to the classes. Certificates submitted afterwards shall not be entertained on any count. A condonation fee as fixed by the college for those who put in attendance between 65 and 74 per cent shall be charged before the student is permitted to the end examination.

Attendance may also be condoned as per the State Government rules for those who participate in prestigious sports, co- and extra-curricular activities provided their attendance is in the minimum prescribed limits for the purpose and recommended by the concerned authority.

Attendance will be indicated in the marks memo by a letter code as follows :

Grading of Attendance :

90% and above	A (Very Good)
75% to 89%	B (Good)
65% to 74%	C (Condoned)
Below 65%	D (Detained)

A student who gets less than 65% (D Grade) attendance in a maximum of two courses in any semester shall not be permitted to take the end-semester examination in which he/she falls short. His/her registration for those courses will be treated as cancelled. The student should re-register and repeat those courses as and when offered next.

R 5.1 : If a student gets D grade in more than two courses in any semester he/she shall be detained and has to repeat the entire semester.

R 6.0 Minimum Academic Requirement :

The following academic requirements shall be met along with the attendance requirements mentioned above to be eligible for the award of the B.Tech. degree.

i. A student shall acquire at least C grade in attendance to be eligible to appear for the end-semester examination in the concerned

subject

ii. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, if he/she secures not less than 35% of marks in external end examination, and a minimum of 40% of marks on the aggregate of internal evaluation and external examination taken together.

iii. In case of practical / drawing / project / seminar, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if the student secures a minimum of 50% in the end examination and not less than 50% marks on the aggregate in the internal evaluation and external end examination taken together.

iv. A student shall be promoted from IV to V semester, if he acquires 76 out of 108 credits upto the end of IV Semester (from I, II, III semesters regular and supplementary examinations & IV semester regular examinations) before he/she enters V Semester.

v. A student shall be promoted from VI to VII semester, only if he / she fulfills the academic requirements of total 100 credits out of which all 52 from first year shall be completed, from the examinations held up to IV semester including supplementary examinations.

vi. Student shall register and put up minimum attendance in all 224 credits and earn 216 credits or more. Marks obtained in the best 216 out of 224 credits shall be considered for the award of Percentage/Class/Division.

vii. A student who fails to earn 216 credits as indicated in the course structure including compulsory subjects as indicated in table given in R2.0 within eight academic years from the year of his/her admission shall forfeit his/her seat and his/her admission stands

cancelled.

R 7.0 Remedial program for defaulters:

A Remedial programme during 8.40 - 10.20 a.m. / 3.20 - 5.00 p.m. in subsequent semesters is offered for those students who had taken the course earlier but failed to fulfill the attendance requirements and detained due to shortage of attendance in not more than two subjects. However, this facility shall not be extended to those candidates who are detained for want of attendance as per regulations R 5.1.

i Remedial programme shall be announced at the beginning of every semester. The announcement of subjects offered for the summer programme is at the discretion of the Principal. A student shall have to register within the time stipulated in the announcement by paying the prescribed fee.

ii. The number of total contact hours and method of evaluation for any remedial program shall be the same as those for a regular semester.

iii. It is desirable for a candidate to put up 100% attendance in all the subjects registered for the remedial programme. However 25% concession in attendance may be permitted at the discretion of the principal based on the merits of the individual case under extraneous conditions with proper evidence. No further condonation of attendance on par with the regular semester shall be permitted.

iv. If a candidate is failed to satisfy the attendance requirement in a course registered during remedial programme, then he has to repeat the course in the subsequent remedial programme when offered next.

v. The method of internal evaluation is same as for the regular B.Tech programme. I mid examination shall be completed by the end of IV weeks and II mid to be completed by the end of VIII weeks of the programme.

vi. The earlier internal marks secured in the regular semester for the subjects registered in the remedial programme are nullified and internal marks from the latest remedial programme shall be final.

vii. The credits for the courses registered during the remedial programme can be earned from the end semester examinations following the corresponding regular semester.

viii. Attendance and completion of subjects during the remedial programme shall be suitably reflected in the consolidated marks memo.

No student can register for more than two courses during a remedial term.

Withdrawal from a remedial program after registration will not entitle for any refund of fees.

R 8.0 Supplementary examinations :

Supplementary examinations for the odd semester shall be conducted with the regular examinations of even semester and vice versa, for those who appeared and failed in regular examinations.

R 9.0 Class/Division :

70% and above : First Class with distinction
60% and above, but less than 70% : First Class
50% and above, but less than 60% : Second Class.
40% and above, but less than 50% : Pass Class
Less than 40% : Fail

**** A candidate shall get an aggregate of 40% overall at the end of VIII semester while fulfilling a minimum of 216 credits for the award of B.Tech degree. The best 216 out of 224 credits shall be considered for the award of class/division.***

REGULATIONS FOR B.TECH. (LATERAL ENTRY) STUDENTS ADMITTED INTO III SEMESTER (II YEAR) (UNDER AUTONOMOUS STREAM)

RL 1.0

1.1 The selection and admission process shall be as per Government of Andhra Pradesh rules through ECET.

1.2 A student admitted to B.Tech. through lateral entry scheme joins the College in the III Semester of the respective 8-Semester program. The duration of the programme is 3 years / 6 semesters. However, if a student can not complete within 3 years, he can do so by taking more time but not more than consecutive 6 years / 12 semesters.

RL 2.0 These students are exempted from social work.

RL 3.0 The attendance requirements shall be same as those admitted into four year B.Tech programme, I- Semester (Autonomous stream).

RL 4.0 Minimum Academic Requirements :

i) A student shall be promoted to the VII Semester only after securing 56 credits in III and IV semester courses from the examinations including supplementary examinations in these subjects held till the end of VI semester of study.

ii) A student shall register and put up minimum required attendance in all the 172 credits counted from the regular course structure of VIII semester B.Tech programme and earn at least 164 credits prescribed as compulsory to be qualified for the award of B.Tech. degree. Marks out of the best 164 credits shall be considered for the award of class /division.

RL 5.0 All other regulations are same as those applicable to the students admitted into B.Tech I-Semester under Autonomous stream.

RL 6.0 Subjects are identified as exempted / mandatory / pre-requisites. A student has to attend classes in subjects prescribed as mandatory/ pre-requisites and has to earn the credits in the examinations as and when conducted. The evaluation for the above courses may be totally internal.

TRANSITORY REGULATIONS FOR STUDENTS RE-ADMITTED INTO II - YEAR OF AUTONOMOUS STREAM FROM PREVIOUS REGULATIONS

1. The student has to attend classes in the subjects declared as prerequisites before joining into II year (III or IV semester) under autonomous stream offered in the preceding semester and has to earn the credits in the examinations as and when conducted.
2. For subjects which are not prerequisites but declared as compulsory, the instruction may be taken during the following remedial programmes or as and when they are offered and shall earn the credits in the examinations as and when conducted.
3. The re-admitted students have to appear and pass the I year / II Year I semester (in case of readmission into II semester) subjects by appearing for the examinations as and when conducted by JNT University Kakinada in the failed subjects.

4. Promotion to V semester:

For a student readmitted into III, IV semesters (II year) of Autonomous Stream, to get promoted to V semester (III year - I semester) one has to earn 80 credits up to the end of IV semester.(The credits for I year courses shall be earned from regular and supplementary examinations conducted by JNTU-K and for III semester from regular and supplementary examinations conducted by GVPCE(A) and for IV semester from regular examinations conducted by GVPCE(A) including the courses prescribed as pre-requisite and mandatory for re-admission.

5. Promotion to VII semester:

For a re-admitted student to get promoted to VII semester (IV year) the following criteria must be satisfied

I. He shall acquire all the 56 credits of the I year courses.

II. He shall acquire at least 104 credits from the courses up to the end of II year excluding prerequisites (Including the supplementary examinations) and secure a pass in prerequisite courses offered during the transition from previous regulations to autonomous regulations.

6. The student seeking readmission into II year shall abide by all other relevant regulations in force under the autonomous stream in addition to the above and shall secure a pass in prerequisite and compulsory courses.

7. For the award of the degree, a student shall acquire 216 credits. However, a pass in prerequisite or mandatory courses shall not be essential for the award of the degree if one satisfies the attendance requirements in such courses, provided the total number of courses attended exceeds those equivalent to 224 credits as per the prescribed curriculum.

TRANSITORY REGULATIONS FOR STUDENTS RE-ADMITTED INTO III - YEAR (V, VI Semesters) OF AUTONOMOUS STREAM FROM JNTU-K REGULATIONS

1. A Student has to attend classes in the subjects declared as pre requisites before joining into V or VI semesters under autonomous stream offered in the preceding semesters/ Remedial programme and can earn the credits in the examinations as and when conducted.
2. For the subjects which are not prerequisites but declared as mandatory, the instruction may be taken during or in the subsequent semester/Remedial Programme and can earn credits in the examinations as and when conducted.
3. The Re-admitted students have to appear and pass the I, II and III year- I semester (in case of readmission into II semester) subjects by appearing for the respective examinations as and when conducted at the earliest by J.N.T. University Kakinada in the failed subjects.
4. **Promotion to VII semester :**

   The promotion into VII semester (IV year I semester) for those readmitted into V or VI semester shall be in accordance with the then prevailing rules of JNTU-K.
5. A student seeking re-admission into V or VI semester (III year) shall abide by all other relevant regulations in force under the autonomous stream.
6. For the award of the degree, a student shall acquire 216 credits. However, a pass in prerequisite or mandatory courses shall not be essential for the award of the degree if one satisfies the attendance requirements in such courses, provided the total number of courses attended exceeds those equivalent to 224 credits as per the prescribed curriculum.

R 10.0 General :

i. Where the words 'he', 'him', 'his', occur, they imply 'she', 'her', 'hers', also.

ii. The academic regulation should be read as a whole for the purpose of any interpretation.

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

iv. The college may change or amend the academic regulations or syllabi from time to time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

PROGRAMMES OF STUDY AND INTAKE

I. U.G. PROGRAMMES :

Courses	Intake
Chemical Engineering	60
Civil Engineering	120
Computer Science and Engineering	120
Electrical and Electronics Engineering	120
Electronics and Communication Engineering	180
Information Technology	90
Mechanical Engineering	120

II. P.G. PROGRAMMES :

Courses	Intake
i) **M.TECH**	
Chemical Engineering	18
Computer science and Engineering	18
Embedded Systems and VLSI Design	18
Communications and Signal Processing	18
CAD/CAM	18
Infrastructural Engg. & Mgmt. in Civil Engg.	18
Structural Engineering	18
Power System Control and Automation	18
Software Engineering	18
ii) M.C.A	60

COURSE STRUCTURE

CIVIL ENGINEERING

I SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1101	Mathematics-I	4	1	0	4
ACT1102	Computer Programming through C	4	1	0	4
ACE1101	Surveying	4	1	0	4
ACE1102	Introduction to Civil Engineering	4	1	0	4
ABE1101	Environmental Studies	4	0	0	4
ACE1103	*Surveying Lab*	*0*	*0*	*3*	*2*
ACT1103	*Computer Programming Lab*	*0*	*0*	*3*	*2*
AME1102	*Engineering Drawing*	*0*	*0*	*3*	*2*
	Total	**20**	**4**	**9**	**26**

II SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
AHE1101	English	4	0	0	4
ABM1102	Mathematics-II	4	1	0	4
AME1103	Engineering Mechanics	4	1	0	4
ABP1101	Physics	4	1	0	4
ABC1101	Chemistry	4	1	0	4
AHE1102	*English Language Lab*	0	0	3	2
AMT1101	*Engineering Workshop*	0	0	3	2
ABP1102	*Physics and Chemistry Lab*	0	0	3	2
	Total	**20**	**4**	**9**	**26**

III SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ABM1103	Probability, Statistics and Numerical Methods	4	1	0	4
ACE1104	Strength of Materials – I	4	1	0	4
ACE1105	Mechanics of Fluid s	4	1	0	4
ACE1106	Building Materials & Construction	4	1	0	4
ACE1107	Engineering Geology	4	0	0	4
ACE1108	Elements of EE and ME	4	0	0	4
ACE1109	*Structural Engineering Lab*	*0*	*0*	*3*	*2*
ACE1110	*Engineering Geology Lab*	*0*	*0*	*3*	*2*
	Total	**24**	**4**	**6**	**28**

IV SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACE1111	Strength of Materials – II	4	1	0	4
ACE1112	Hydraulics and Hydraulic Machinery	4	1	0	4
ACE1113	Concrete Technology	4	0	0	4
ACE1114	Building Planning Services & Drawing	3	0	2	4
AHM1101	Managerial Economics and Financial Analysis	4	0	0	4
ACE1115	Structural Analysis-I	4	0	0	4
ACE1116	*Fluid Mechanics Lab*	*0*	*0*	*3*	*2*
ACE1117	*Concrete Technology Lab*	*0*	*0*	*3*	*2*
	Total	**23**	**2**	**8**	**28**

V SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACE1118	Water Resources Engineering-I	4	1	0	4
ACE1119	Reinforced Concrete Structures-I	4	1	0	4
ACE1120	Geotechnical Engineering-I	4	1	0	4
ACE1121	Structural Analysis-II	4	1	0	4
ACE1122	Transportation Engineering-I	4	0	0	4
ACE1123	Estimation & Quantity Surveying	4	0	0	4
ACE1124	*Transportation Engineering Lab*	*0*	*0*	*3*	*2*
ACE1125	*Geotechnical Engineering Lab*	*0*	*0*	*3*	*2*
	Total	**24**	**4**	**6**	**28**

VI SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACE1126	Water Resource Engineering-II	4	1	0	4
ACE1127	Design of Steel Structures	4	1	0	4
ACE1128	Environmental Engineering-I	4	1	0	4
ACE1129	Remote Sensing & GIS	4	0	0	4
ACE1130	Transportation Engineering – II	4	0	0	4
ACE1131	Geotechnical Engineering-II	4	1	0	4
ACE1132	*Geomatics Lab*	*0*	*0*	*3*	*2*
AHE1103	*Advanced Communication Skills Lab*	*0*	*0*	*3*	*2*
	Total	**24**	**4**	**6**	**28**

VII SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACE1133	Environmental Engineering-II	4	0	0	4
ACE1134	Finite Element Methods	4	1	0	4
ACE1135	Construction Management	4	0	0	4
ACE1136	Reinforced Concrete Structures-II	4	1	0	4
	Elective -I	4	0	0	4
ACE1137	Earthquake Resistant Design				
ACE1138	Industrial Waste and Waste Water Management				
ACE1139	Traffic Engineering				
	Elective -II	4	0	0	4
ACE1140	Air Pollution and Control				
ACE1141	Ground Improvement Techniques				
ACE1142	Bridge Engineering				
ACE1143	*CAD Lab*	*0*	*0*	*3*	*2*
ACE1144	*Environmental Engineering Lab*	0	0	*3*	*2*
ACE11MP	*Industry oriented Mini-Project*	-	-	-	*2*
	Total	**24**	**2**	**6**	**30**

VIII SEMESTER :

COURSE CODE	THEORY/LAB	L	T	P	C
ACE1145	Prestressed Concrete	4	0	0	4
	Elective –III	4	0	0	4
ACE1146	Advanced Structural Design				
ACE1147	Transportation Planning and Design				
ACE1148	Soil Dynamics & Machine Foundations				
	Elective –IV	4	0	0	4
ACE1149	Advanced Structural Analysis				
ACE1150	Environmental Impact Assessment & Management				
ACE1151	Advanced Foundation Engineering				
ACE11SM	*Seminar*	*0*	*0*	*3*	*2*
ACE11CV	*Comprehensive Viva*	-	-	-	*4*
ACE11PW	*Project work*	*0*	*0*	*9*	*12*
	Total	**12**	**0**	**12**	**30**

SYLLABI FOR I SEMESTER

MATHEMATICS – I

(Common to all Branches)

Course Code : ABM1101

L	T	P	C
4	1	0	4

Aim : To impart the necessary fundamental principles that are essential to study the core courses of Engineering**.**

Objective : To motivate and inculcate the logical thinking and methodical approach to solve mathematical problems

UNIT - I

Sequences – Series – Convergence and divergence – Comparison test – Ratio test –Integral test –Alternating series, Leibniz's test

(9.1 to 9.9, 9.12).

Rolle 's theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem –Taylor's theorem and Maclaurin's series (all theorems without proof)

(4.3, 4.4).

UNIT - II

Differential equations of first order (linear, Bernoulli), Linear differential equations with constant coefficients, Method of Variation of parameters .

(11.9, 11.10, 13.1, 13.3-13.8(i), 13.9)

UNIT - III

Applications of Linear differential equations: orthogonal trajectories, Newton's law of cooling, Simple harmonic motion, Oscillatory electrical circuits (LC and LCR circuits).

(12.3, 12.6, 14.2, 14.5)

UNIT - IV

Laplace transform of elementary functions, properties, Transforms of derivatives and integrals – Unit step function – second shifting theorem, Periodic function.

(21.1-21.5, 21.7-21.11)

UNIT - V

Inverse transform –- Inverse transform of Derivatives and Integrals - Convolution theorem – Application of Laplace transforms to ordinary differential equations, Unit step function, Unit impulse function.

(21.12-21.15, 21.17, 21.18)

UNIT - VI

Partial differentiation: Total derivative, change of variables, Jacobians, Taylor's theorem for functions of two variables, maxima and minima of functions of two variables.

(5.5 – 5.9, 5.11)

UNIT - VII

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear first order (standard type) equations.

(17.1 to 17.3, 17.5, 17.6)

UNIT - VIII

Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation, wave equation and two-dimensional Laplace's equation under initial and boundary conditions.

(18.1 to 18.7)

Text Book :

Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

References :

1. Kreyszig E, "Advanced Engineering Mathematics", 8th Ed. John Wiley, Singapore (2001)
2. Greenberg M D, "Advanced Engineering Mathematics", 2nd Ed, Pearson Education, Singapore, Indian Print (2003).

COMPUTER PROGRAMMING THROUGH C

Course Code : ACT1102

L	T	P	C
4	1	0	4

Aim : To give the basic idea about programming.

Objective : To make the students capable of programming in high level computer languages as well as applications.

UNIT - I

Algorithm, Flow chart, Program development steps, Basic structures of C Language, C tokens, Data types and sizes, Declaration of variables, Assigning values, Arithmetic, Relational and Logical operators, Increment and decrement operators, Conditional operator, Bitwise operators, Type conversions, Expressions, evaluation, Input output statements, blocks.

UNIT - II

If and switch statements, while, do while and for statements. C programs covering all the above aspects.

UNIT - III

One dimensional and two dimensional arrays, Initialization, String variables declaration, reading, writing, basics of functions, parameter passing, String handling functions.

UNIT - IV

User defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, Example C Programs.

UNIT - V

Pointers and arrays: Pointers and addresses, Pointers and arrays, Pointers and function arguments, address arithmetic, character pointers and functions

UNIT - VI

Pointers to pointers, multi-dimensional arrays, initialization of pointer arrays, command line arguments, pointers to functions, function pointers.

UNIT - VII

Structure definition, initializing, assigning values, passing of structures as arguments, arrays of structures, pointers to structures, self reference to structures, unions, type-defs, bit fields, C program examples.

UNIT - VIII

Console and file-I/O: Standard I/O, Formatted I/O, Opening and closing of files, I/O operations on files, command line arguments.

Text books :

1. Herbert Schild : Complete Reference Using C, 4th Edition, Tata McGraw Hill, 2009.
2. Yashawanth Kanethkar : Let us C, 9th Edition, BPB Publishers, 2009.

References :

1. B.A.Fouruzan and R.F.Gilberg : Computer Science, A structured programming approach using C, 3rd Edition, Thomson Publishers, 2008.
2. B.W.Kerninghan and Dennis M. Ritche : C Programming Language, 2nd Edition, Pearson Education, 2009.
3. Stephen G.Kochan : Programming in C – 3rd Edition, Pearson Education, 2005.
4. N. B. Venkateswarlu, E. V. Prasad : C & Data structures, 1st Edition, S. Chand publications, 2002.

SURVEYING

Course Code : ACE1101

L	T	P	C
4	1	0	4

Aim : To introduce the basic concepts of survey.

Objectives : Overview of plane survey and Geodetic survey. Studying various instruments for taking linear and angular measurements. Computing areas and volumes. Designing and setting out simple curves.

UNIT - I

Introduction : Overview of plane surveying (chain, compass and plane table), Objectives, Principles and classifications. Introduction to Total Station and Global positioning system,

UNIT - II

Distances and Direction : Distance measurement conventions and methods; use of chain and tape, Electronic Distance Measurements, Meridians, Azimuths and Bearings, declination, computation of angle.

UNIT - III

Levelling and Contouring : Concept and Terminology, Temporary and permanent adjustments- methods of leveling and characteristics. Contours- Uses of contours- methods of conducting contour surveys and their plotting.

UNIT - IV

Computation of Areas and Volumes : Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes. Determination of the capacity of reservoir. Volume of barrow pits.

UNIT - V

Theodolite : Description, Uses – temporary adjustments and permanent adjustments, measurement of horizontal and vertical angles. Trigonometrical levelling, Traversing.

UNIT - VI

Tacheometric Surveying : Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

UNIT - VII

Curves : Types of curves, design and setting out – simple and compound curves.

UNIT - VIII

Errors and Approximations

Text Books :

1. "Surveying (Vol – 1, 2 & 3), by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi, 17th Edition, 2009.
2. Duggal S K, "Surveying (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. New Delhi, 10th Edition, 2004.
3. Surveying and levelling by R. Subramanian, Oxford university press, New Delhi, 2008.

References :

1. Arthur R Benton and Philip J Taety, Elements of Plane Surying, McGraw Hill – 2000
2. Arora K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 9th Edition, 2008.
3. Chandra A M, "Plane Surveying", New age International Pvt. Ltd., Publishers, New Delhi, 2002.
4. Chandra A M, "Higher Surveying", New age International Pvt. Ltd., Publishers, New Delhi, 2002.

INTRODUCTION TO CIVIL ENGINEERING

Course Code : ACE1102

L	T	P	C
4	1	0	4

Aim : To introduce the basic concepts of civil engineering.

Objectives : To attain knowledge on civil engineering by introducing the new developments, various disciplines, challenges, responsibilities and achievements in Civil engineering.

UNIT - I

Historical background

UNIT - II

Role of Civil Engineers in Society;

UNIT - III

Outstanding accomplishments of the profession;

UNIT - IV

Explanation of applications of various disciplines of Civil Engineering

Transportation

Environmental

Geotechnical

Structural

Water Resources

Surveying, Estimation

Quality Control

Project Management

UNIT - V

Present status and future challenges of civil engineering profession.

UNIT - VI

Professional responsibility.

UNIT - VII

Concepts of analysis & design, interpretation of results and decision making, computational approaches, experiments.

UNIT - VIII

Technical Report writing

Invited lectures

Case Studies

Site visits.

Professional Societies in Civil Engineering and their activities

References :

1. Engineers and Engineering, Oxford Univ. Press, 1970
2. Engineering Cases, ASEE, 1982
3. Invitation to Civil Engineering, Laithwaite, E., Basil Blackwell Inc., Oxford, UK., 1984
4. Engineering- an outline for the intending student, Thing, M.W., Routledge & Kegan Paul, London 1972.

ENVIRONMENTAL STUDIES

Course Code : ABE1101

L	T	P	C
4	0	0	4

Aim : To create awareness on environmental hazards.

Objective : The student shall acquire knowledge regarding utilization of natural resources, and the imbalance in ecosystems, environmental pollution caused by various practices and safe guards to be taken.

UNIT - I

Multidisciplinary nature of Environmental Studies : Definition, Scope and Importance – Need for Public Awareness.

UNIT - II

Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems -Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. – Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - III

Ecosystems : Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems
(ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV

Biodiversity and its conservation : Introduction - Definition: genetic, species and ecosystem diversity.- Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social,ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a megadiversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Exsitu conservation of biodiversity.

UNIT - V

Environmental Pollution : Definition, Cause, effects and control measures of :

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

Solid waste Management : Causes, effects and control measures of urban and industrial wastes. – Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

UNIT - VI

Social Issues and the Environment : From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. –Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

UNIT - VII

Human Population and the Environment : Population growth, variation among nations. Population explosion - Family Welfare Programme. - Environment and human health. -Human Rights. -Value Education. -HIV/ AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

UNIT - VIII

Field work : Visit to a local area to document environmental assets - River / forest / grassland/hill/mountain -Visit to a local polluted site-Urban/ Rural / industrial / Agricultural Study of common plants, insects, birds. - Study of simple ecosystems-pond, river, hill slopes, etc.

Text Books :

1 Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

2 Environmental Studies by R. Rajagopalan, Oxford University Press.

Reference :

1. Textbook of Environmental Sciences and Technology by M. Anji Reddy, B

SURVEYING LAB

Course Code : ACE1103

L	T	P	C
0	0	3	2

Aim : To introduce the concepts of plane surveying equipments

Objectives : The main objective is to attain the knowledge of equipments used for taking linear and angular measurements and setting contours. Transferring points on ground and Locating ground stations on map.

LIST OF EXERCISES

1. Survey of an area by chain survey (closed traverse) and Plotting
2. Determination of Distance between two in-accessible points with compass
3. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
4. Radiation method & Intersection methods by plane table survey
5. An exercise of Longitudinal Section & Cross Section and plotting with dumpy level(Two exercises)
6. An exercise on contouring using dumpy level
7. Measurement of horizontal angles by method of repetition and reiteration with theodolite
8. Trigonometric leveling – Heights & Distance problem (Two exercises)
9. Height & distance using principles of tachometric surveying.
10. Curve setting – Different methods (Two exercises)

COMPUTER PROGRAMMING LAB

Course Code : ACT1103

L	T	P	C
0	0	3	2

Aim : To give basic knowledge with practical orientation of programming language.

Objective : To train the students to write programmes in C language for different applications.

List of Programmes :

1. To write C programs for the following
   a) Sum of individual digits of a positive integer.
   b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms in the sequence. Write a c program to generate to generate the first n terms of the Fibonacci sequence.

2
   a) To write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user
   b) To write a C program to calculate the following sum:
   Sum=$1+x^2/2!+x^4/4!$ —————— upto given 'n' terms.
   c) To write a c program to find the roots of a quadratic equation.

3. To write C programs that uses both recursive and non-recursive functions
   i) To find the factorial of a given number.
   ii) To find the GCD(greatest common divisor) of two given integers.
   iii) To solve Towers of Hanoi problem.

4. The total distance traveled by vehicle in 't' seconds is given by distance=ut+1/2at^2 where 'u' and 'a' are the initial velocity (m/sec) and acceleration (m/sec^2). Write a C program to find the distance traveled at regular intervals of time given values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

5. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +, -, *, and %).

6. Write a C program to find the largest and smallest number in a list of integers.

7. Write a C program that uses functions to perform the following
   a. Addition of Two Matrices
   b. Multiplication of Two Matrices

8. Write a C program that uses functions to perform the following operations
   a. To insert a sub-string in to given main string from a given position
   b. To delete n characters from a given position in given string.

9. Write a C program to determine if the given string is a palindrome or not.

10.
   a) Write a C program that displays the position or index in the string S where the string T begins, or -1 if S does not contain T.
   b) Write a C program to count the lines, words and characters in a given text.

11. To write a C program
    a) to generate Pascal's triangle
    b) to construct a pyramid of numbers

12. To write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression $1+x+x^2+x^3+\ldots x^n$
    For example : if n is 3 and x is 5, then the program computes 1+5+25+125. print x,n, the sum.

    Perform error checking. For example the formula does not make sense for negative

    Exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the nest pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too..

13. To write a C program
    a) to find the 2's compliments of a binary number.
    b) to convert a Roman numeral to its decimal equivalent

14. To write a C program that uses functions to perform the following operations
    a. Reading a complex number
    b. Writing a complex number
    c. Addition of 2 complex numbers
    d. Multiplication of 2 complex numbers
    (Note: represent complex number using a structure)

15. To write a C program
    a) to copy the contents from one file to another.
    b) to reverse the first n characters in a file.

    (Note: the file name and n are specified on the command line)

c) to fine the no. of characters, no. of words, no. of lines in a given file.

16. To implement the algorithms for the below given iterative methods using C to find one root of the equation f(x)=x sinx + cosx=0

    a) Bisection b) False Position c) Newton-Raphson
    d) Successive approximation

17. To write C programs to implement the Lagrange interpolation

18. To implement the Newton- Gregory forward interpolation using C language.

19. To implement in C the linear regression algorithm.

20. To implement in C the polynomial regression algorithm.

Text Books :

1. Programming in C , P. Dey & M. Ghosh, Oxford Univ. Press
2. C and Data Structures, E. Balaguruswamy, TMH publications
3. C Programming and Data structures, P. Padmanabham, 3rd Edition, BS publications.
4. Numerical Methods for Scientific and Engineering Computation, M.K. Jain, S.R.K. Iyengar & R.K. Jain, New Age International Publishers.
5. Elementary Numerical Analysis, Aitkinson & Han, Wiely India, 3rd Edition 2006.

ENGINEERING DRAWING

Course Code : AME1102

L	T	P	C
0	0	3	2

Aim & Objectives :

1. To make the student well familiar to the drawing practices and convention
2. To familiarize the various engineering curves used in industry
3. To enable student draft simple engineering components.

LIST OF EXERCISES

1 Introduction to Engineering drawing & basics of Geometrical construction

2 Construction of parabola, ellipse, hyperbola

3 Construction of Involutes and Cycloidal curves

4 Projections of points and lines inclined to one plane

5 Projections of lines inclined to both the planes

6 Projections of planes in simple positions, planes inclined to one plane

7 Projections of planes inclined to both the planes

8 Demonstration & Practice: Computer aided drafting of lines, planes and dimensioning

9 Projections of solids in simple positions

10 Projections of solids inclined to both the planes

11 Isometric projections

12 Demonstration & Practice: Computer aided drafting of solids and dimensioning.

Text Books :

1. Engineering Drawing by N.D. Bhatt

2. Engineering graphics with Auto CAD- R.B. Choudary/Anuradha Publishes

3. Computer Aided Engineering Drawing - Trymbaka Murthy - I.K. International.

SYLLABI FOR II SEMESTER

ENGLISH

Course Code : AHE1101

L	T	P	C
4	0	0	4

Reading and Writing skills

Objectives :

The primary objective of the course is to help students of engineering to achieve a sound foundation in communicational skills, basic grammar and vocabulary. It also enables them to become successful communicators in academic, professional and social areas of life.

The course aims to enable the students to use English effectively for the purpose of

- Understanding class room lectures in different subjects
- Reading technical and general materials
- Effective written communication in professional contexts

Outcomes :

- The learners develop adequate skills in skimming, scanning, intensive and extensive reading
- The learners also develop enough vocabulary to be clearly expressive in any group - Professional or Managerial or Social
- The learners can correspond and communicate in descriptive, analytical modes with ease.

Course work :

To achieve the above objectives, instruction will be imparted through relevant ESP materials, articles from newspapers, technical journals, magazines, industry materials etc. in classes and laboratory. Students will be given individual and holistic practice in LSRW skills.

Contents :

Reading :

- Reading with a purpose; Reading for understanding; skimming, scanning etc;
- Reading and interpreting charts and diagrams
- Vocabulary, synonyms, antonyms, prefixes, suffixes, confusables, one-word substitutes etc.

Writing :

- common errors, articles, prepositions, tenses, concord, phrasal verbs, modals, conditionals etc. (Remedial Grammar)
- Practice of writing- definition, description
- Paragraph writing with coherence, cohesiveness and clarity
- Essay, report and précis writing

Reference skills **:** Use of dictionary, thesaurus, library and internet materials.

UNIT - I

1. Around the House *(Language in Use)*
2. Education on Education *(English for Engineers)*

UNIT - II

1. On Holiday *(Language in Use)*
2. Vocabulary- synonyms, antonyms, prefixes, suffixes, confusables, one-word substitutes etc.

UNIT - III

1. Imagining *(Language in Use*)
2. Tenses & Concord, Articles & Prepositions

UNIT - IV

1. New Information Technology and Poverty Eradication (English for Engineers)
2. The media (Language in Use)

UNIT - V

1. What we must Learn from the West *(English for Engineers)*
2. Paragraph writing, Note-making and Minute writing

UNIT - VI

1. Essay writing
2. Value added Life *(English for Engineers)*

UNIT - VII

1. Breaking the Law *(Language in Use)*
2. Key item *(English for Engineers)*

UNIT - VIII

1. Letter and Précis writing
2. Dialogue writing

Text Books :

1. Language in Use(Intermediate)-Cambridge University Press India Pvt. Ltd.- Reprint-2008.
2. English for Engineers-Regional Institute of English-Bangalore, Foundation Books Pvt. Ltd, 2006.

References :

1. "Study reading- A course in reading skills for academic purposes"-CUP by Eric H. Glendinning & Beverly Holmstorm, 2004.
2. Study writing – Liz Hamp Lyons, Ben Heasley-CUP, 2004.
3. Word Power Made Easy- Norman Lewis, Lotus Press, 2006.
4. Practical English Usage- Oxford University Press, Michael Swan, 3rd Edition, 2005.
5. Murphy's English Grammar-Murphy-CUP, 3rd Edition, 2004.

Suggested Reading : Stories of humour, adventure, mystery and autobiographies of eminent scientists.

MATHEMATICS – II

(Common to all Branches)

Course Code : ABM1102

L	T	P	C
4	1	0	4

Aim : To impart the necessary fundamental principles that are essential to study the core courses of Engineering

Objective : To motivate and inculcate the logical thinking and methodical approach to solve mathematical problems

UNIT - I

Matrices: Rank – Normal form - Echelon form – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.(Gauss Jordan)

(2.8, 2.11)

UNIT - II

Eigen values, Eigen vectors – properties – Cayley-Hamilton Theorem (only statement) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalisation of matrix. (2.14-2.17)

UNIT - III

Quadratic forms - Linear Transformation - Orthogonal Transformation. Reduction of quadratic form to canonical form, Nature of the quadratic form.

(2.12, 2.18 , 2.19).

UNIT - IV

Double and triple integrals, Change of order, change of variables

(7.1 – 7.3 , 7.5, 7.7).

UNIT - V

Vector Differentiation**:** Differentiation of vectors, Scalar and Vector point functions. Gradient of a scalar field and directional derivatives- Divergence and curl of a Vector field and it's physical interpretation.

(8.1, 8.4 – 8.8)

UNIT - VI

Vector Integration - Line integral – -Circulation-work done - surface and volume integrals Vector integral theorems: Green's theorem- Stoke's and Gauss's Divergence Theorem (Without proof). Verification of Green's - Stoke's and Gauss's Theorems. (8.10 – 8.17)

UNIT - VII

Fourier series: Euler's formulae, Conditions for Fourier expansion, Change of interval, even and odd functions, half range series.

(10.1 – 10.7)

UNIT - VIII

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – Finite Fourier transforms.

(22.1 – 22.4)

Text Book :

1. Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

References :

1. Kreyszig E, "Advanced Engineering Mathematics", 8th Ed. John Wiley, Singapore (2001)
2. Greenberg M D, "Advanced Engineering Mathematics", 2nd Ed, Pearson Education, Singapore, Indian Print (2003).

ENGINEERING MECHANICS

Course Code : AME1103

L	T	P	C
4	1	0	4

Aim & Objectives :

1. To develop logical thinking approach to engineering problems.
2. Calculation and estimation of fourses developed in various engineering structures.

UNIT – I

SYSTEMS OF FORCES : Introduction – parallelogram law – Forces and components - Resultant of coplanar concurrent forces - component forces in space - vector notation – moment of force – principle of moments – couples. Resultant of planar force systems and spatial concurrent force system.

UNIT – II

EQUILIBRIUM OF FORCE SYSTEMS : Equilibrium – free body diagrams – Equations of equilibrium – equilibrium of planar systems – graphical methods and analytical methods for equilibrium of planar systems – equilibrium of spatial concurrent force systems.

UNIT – III

FRICTION: Introduction – Theory of friction – Angle of friction – Laws of friction - static friction – Kinetic friction-friction in bodies moving up or down on an inclined plane-screw friction and screw jack.

UNIT – IV

CENTROIDS AND CENTERS OF GRAVITY : Centre of gravity – centroids of area and lines – determination of centroids by integration – centroids of composite figures – theorems of Pappus.

UNIT – V

AREA MOMENT OF INERTIA : Moment of inertia – polar moment of Inertia – Radius of gyration - Transfer theorem for moment of Inertia – Moment of inertia of composite areas – product of inertia – Transfer formula for product of Inertia.

MASS MOMENT OF INERTIA : Moment of inertia of masses – Radius of gyration – Transfer formula for mass moment of inertia – Mass moment of Inertia by Integration.

UNIT – VI

KINEMATICS : Rectilinear motion-curvilinear motion - Rectangular components of curvilinear motion - Normal and Tangential components of acceleration, Radial and transverse components - Kinematics of rigid bodies - angular motion – fixed axis rotation – Definition and analysis of plane motion.

UNIT – VII

KINETICS: Kinetics of rigid bodies – equation of planes motion – fixed axis rotation – rolling bodies (simple examples) - general plane motion (Simple examples).

UNIT – VIII

WORK ENERGY METHODS : Work energy equations for translation – applications to particle motion – connected systems – fixed axis rotation (Simple cases)

Text Books :

1. I.B. Prasad : Applied Mechanics, Khanna Publishers, 19th Edition, 2009.
2. Ferdinand L. Singer : Engineering Mechanics, Harper Collins Publishers India, 3rd Edition, 2008.

References :

1. Irving. H. Shames : Engineering Mechanics, PHI Publishers, 4th Edition, 2008.
2. Timoshenko & Young : Engineering Mechanics, MGH Publishers, 4th Edition, 2010.
3. A.K. Tayal : Engineering Mechanics, Umesh Publishers, 13th Edition, 2008.
4. K.L. Kumar, Engineering Mechanics, TMH Publishers, 3rd Edition, 2009.

PHYSICS

Course Code : ABP1101

L	T	P	C
4	1	0	4

Aim : To give prerequisites in understanding the advanced Physics leading to applications in engineering field.

Objective : To impart the students the concept and principles in Engineering to enable them to comprehend and take up the experimental work independently.

UNIT - I

VIBRATIONS & ACOUSTICS OF BUILDINGS :

i) Overview of vibrations with emphasis on damped and forced oscillations- resonance, coupled oscillators - two coupled pendulums and normal mode solutions.

(Engineering Physics - Gaur & Gupta Chap - 33, and Unified Physics, Vol-1, S L Gupta & Sanjeev Gupta, Chap-11 (coupled oscillators)

ii) Reverberation and Reverberation time – Sabine's formula for reverberation time – measurement of absorption coefficient of material- Basic requirements of acoustically good hall -Factors affecting the architectural acoustics and their remedies.

(Engineering Physics - Gaur & Gupta Chap - 14)

UNIT – II

PHYSICAL OPTICS :

Interference: Superposition of waves, Young's double slit experiment, Interference in thin films by reflection, Newton's rings experiment with necessary theory.

Diffraction: Fresnel and Fraunhoffer diffraction, Diffraction at single slit and diffraction grating, determination of wavelengths of various spectral lines, resolving power of grating.

Polarization: Types of Polarizations, Brewster's law, Double refraction, Nicol Prism, Polaroid's.

(Engineering Physics - Gaur & Gupta Chap - 26, 27, 28 & 29)

UNIT – III

CRYSTAL PHYSICS & SUPERCONDUCTIVITY :

i) Crystal Physics : Space lattice, basis and crystal structure, Unit cell, primitive cell, Seven crystal systems, Bravais lattices- SC, BCC, FCC crystal structures- crystal planes and Directions- Miller indices, Derivation of inter planar spacing.

(Applied Physics for Engineers - P K Palanisamy Chap - 2)

ii) Superconductivity: superconducting phenomenon, Meissner effect, Type I & Type II Super conductors, BCS theory, DC and AC Josephson effects, SQUIDS, High Temperature Super conductors- Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 9)

UNIT – IV

QUANTUM MECHANICS :

Dual nature of matter, DeBroglie wave length, Time independent Schrödinger wave equation, Physical significance of wave function, particle in a potential well, rigid and non rigid walls, Tunneling effect

(Applied Physics for Engineers - P K Palanisamy Chap - 3)

UNIT – V

FREE ELECTRON THEORY :

Introduction, Quantum free electron theory, Fermi-Dirac distribution and its dependence on temperature, Fermi energy, Electron scattering and resistance, motion of an electron in periodic potential, Kronig-Penney model (qualitative treatment), effective mass; classification of solids.

(Applied Physics for Engineers - P K Palanisamy Chap - 4 & 5)

UNIT – VI

DIELECTRICS :

Basic definitions, relation between **P,D** and **E** vectors, Polarization mechanisms, expression for electronic polarizability, Internal fields in solids,

Claussius-Mosotti equation, frequency and temperature dependence of electronic polarization, Dielectric strength, Dielectric loss, Loss tangent and Dielectric breakdown, Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 6)

UNIT – VII

LASERS AND FIBER OPTICS :

i) Introduction, Characteristics of lasers, Induced absorption, spontaneous and stimulated emission of radiation, Population Inversion, Einstein's coefficients, Low and high power Lasers, Ruby laser, He-Ne laser, CO_2 and semiconductor laser, Applications of lasers.

(Applied Physics for Engineers - P K Palanisamy Chap - 10)

ii) Basic principle of propagation of light in optical fibers, Numerical aperture, acceptance angle, Derivation of Numerical aperture, Classification of optical fibers on the basis of refractive index profile, Fiber optic communication system, Applications.

(Applied Physics for Engineers - P K Palanisamy Chap - 2)

UNIT – VIII

FUNCTIONAL MATERIALS :

i) Bio materials, SMART materials, metallic glasses, metal matrix composites, Electrets – piezo and ferro electric matrerials.

(Engineering Physics by V Rajendran, Chap - 21, 24, 25, materials Science - M Armugam - Metal Matrix composites and Electrets, SMART Materials chap -11)

ii) Nanophase materials: Introduction to nano materials, types of nano materials, Fabrication Techniques: ball milling, nano lithography, CVD, carbon nano tubes (CNT's), Applications.

(Engineering Physics M R Sirnivasn**,** Chap - 15)

Text Books :

1. R.K. Gaur and S.L.Gupta, Engineering Physics, 8th Edition, Dhanpaat Rai, 2003.
2. P.K. Palanisamy, Applied Physics, 2nd Edition, Scitech Publishers, 2010.
3. M.R. Srinivasan, Engineering Physics, 1st Edition, New Age Publishers, 2009.
4. V. Rajendran, Engineering Physics, TMH, 2009.

References :

1. C.Kittel, Introduction to Solid State Physics, 7th Edition, John Wiley, 2007.
2. M Ross, Lowrence, Shepard, J Wulff Structure and properties of Materials, (Volume-4, Electronic properties), Wiley East Publishers, 2004.
3. Avadhanulu & Kshirasagar, Engineering Physics, 9th Edition, S. Chand Publishers, 2008.
4. S.O. Pillai, Solid State Physics, New Age Publishers, 2004.
5. Sulabh. K. Kulkarni, Nano Technology - Principles and Practices, 2006.
6. V.Raghavan, Material Science, 5th Edition, PHI, 2007.
7. R.L.Singhal, Solid State Physics, 6th Edition, Kedarnadh, Ramnadh Publishers, 2003.
8. A. Beiser., Perspectives in Modern Physics, 5th Edition, McGraw Hill Publishers, 2006.
9. A.J. Dekker, Electrical Engineering materials, 1st Edition, Mac Millan, 2007.
10. M. Armugam, Material Science,3rd Edition, Anuradha Publishers, 2009.
11. S.L. Gupta, & Sanjeev Gupta, Unified Physics, Vol - 1, 16th Edition, Jaiprakash Nath & Co., 2007.

CHEMISTRY

Course Code : ABC1101

L	T	P	C
4	1	0	4

Aim : The aim of the course is to provide basic chemistry background required for under graduate students of engineering.

Objective : The Objective of the course is to provide an over view of chemical properties of materials which the engineers are likely to use during their professional careers.

UNIT - I

ELECTROMOTIVE FORCE

Electrode potential, Nernest equation, EMF of electro chemical cell, calculation of cell potential, concentration cell, determination of P^H of solution.

BATTERIES - primary cell-Dry or Lachanche cell, alkaline battery; secondary cells (storage batteries or accumulators) – Lead-acid Accumulator, Nickel-cadmium battery.and lithium ion battery.

Fuel cells - hydrogen, oxygen fuel cell, phosphoric acid fuel cell, solid oxide fuel cells.

UNIT - II

CORROSION AND ITS CONTROL

Introduction-Dry or chemical corrosion, Wet or Electrochemical corrosion-Hydrogen evolution type, oxygen absorption type, Galvanic corrosion and concentration cell corrosion, pitting ,waterline, and stress corrosion; passivity; Galvanic series; factors influencing corrosion. Corrosion control-proper designing, cathodic protection, modifying the environment and using

inhibitors. Protective coatings- anodic and cathodic coatings; Hot dipping-Galvanizing and Tinning, Metal cladding; Electroplating; Electro less plating; cementation or diffusion coatings.

UNIT - III

CHEMICAL KINETICS

Arrhenius theory-effect of temperature on reaction rates –concept of activated complex; collision theory of reaction rates; Lindeman's theory of unimolecular reactions, steady state approximation; Transition state theory.

UNIT - IV

BONDING IN COORDINATION COMPOUNDS

Valence bond theory- limitations, crystal field theory, ligand field theory-octahedral and tetrahedral complexes. Spectral properties of d^1 ions & magnetic properties of low spin and high spin complexes.Molecular orbital theory as applied to octahedral complexes not involving pi-bonding.

UNIT - V

PRINCIPLES AND MECHANISMS OF ORGANIC REACTIONS

Bond fission – homolysis and heterolysis-examples. Types of reagents-electrophilic and nucleophilic reagents -examples. Concept of aromaticity, Huckel's (4n+2) rule. Introduction to mechanistic aspect of electrophilic aromatic substitution- nitration, sulphonation. Friedel-Crafts alkylation and acylation.

UNIT - VI

POLYMER SCIENCE AND TECHNOLOGY

Nomenclature; Types of polymerization, Mechanism of addition and condensation polymerization, Effect of polymer structure on properties. Plastics- Thermo and thermosetting plastics, constituents of a plastic. Preparation, properties and uses of polythene, PVC, Teflon, nylons-6,6, bakelite and silicones.

RUBBER - Natural rubber-structure-vulcanization, compounding of rubber; synthetic rubbers-Buna-Sand Buna-N.

UNIT - VII

SEMI CONDUCTING MATERIALS

Band theory of solids, Types-Intrinsic, extrinsic,(n-type, p-type,) non-elemental semi conducting materials- stoichiometric semi conducting compounds, defect semiconductors, controlled valency semiconductors. Preparation of semiconductors- Zone refining, Czochralski crystal pulling technique, Doping technique.

UNIT - VIII

CHEMISTRY OF ENGINEERING MATERIALS

Cement - classification; Portland cement- raw materials, manufacture of Portland cement, chemical constititution of Portland cement, setting and hardening of Portland cement.

REFRACTORIES - Classification and properties of refractories

FUELS - classification; calorific value and its determination using Bomb and Junker's gas calorimeter, theoretical calculation of calorific value-Proximate and ultimate analysis of coal; Refining of petroleum-, catalytic cracking; catalytic reforming, knocking, octane rating, improvement in anti knock characteristics, unleaded petrol; diesel engine fuels, cetane value

LUBRICANTS - Friction- mechanism of lubrication-Fluid film lubrication; thin or boundary lubrication and extreme pressure lubrication, classification-Lubricating oils, greases and solid lubricants.

Text books :

1. A text book of Engineering Chemistry by Jain& Jain, Dhanapat Roy publishing company, 15th Edition, 2006.
2. Engineering chemistry by Shiva Shankar, Tata Mc Graw Hill, 2008.

References :

1. Engineering Chemistry –Sashi chawala, Dhanpath Rai Publications, 3rd Edition, 2010.
2. A Text Book of Engineering Chemistry – C. Parameswara Murthy, C.V. Agarwal and Andhra Naidu, B.S. Publications, 1st Edition, 2006.
3. Concise inorganic Chemistry-J.D.Lee, Black well science publications, 5th Edition, 2005.
4. Advanced organic chemistry-Arun Bahl & B.S.Bahl, S.Chand Publications, 2010.
5. Physical chemistry- Gurudeep Raj, Goel Publications, 3rd Edition, 2007.
6. Text book of Engineering Chemistry - S.S. Dara, S. Chand Publications, 11th Edition, 2006.

ENGLISH LANGUAGE LAB

Course Code: AHE1102

L	T	P	C
0	0	3	2

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Objectives :

- To make students recognise the sounds of English through Audio-Visual aids and Computer Software.
- To help them overcome their inhibitions and self- consciousness while speaking in English and to build their confidence. *The focus shall be on fluency rather than accuracy.*
- To enable them to speak English correctly with focus on stress and intonation.

Syllabus :

The following course content is prescribed for the **English Language Laboratory** sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues / Role Play.
4. Oral Presentations- Prepared and Extempore/Speaking personally
5. 'Just A Minute' Sessions (JAM).
6. Describing things / Narration
7. Information Transfer

8. Debate
9. Telephoning Skills.
10. Giving Directions.

Suggested Software :

- Cambridge Advanced Learners' English Dictionary with CD.
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD.
- Learning to Speak English - 4 CDs
- Microsoft Encarta with CD
- Murphy's English Grammar, Cambridge with CD

References :

1. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.

2. English Pronouncing Dictionary Daniel Jones Current Edition with CD.

3. Spoken English- R. K. Bansal and J. B. Harrison, Orient Longman 2006.

4. A Practical course in English Pronunciation, (with two Audio cassettes) by J. Sethi, Kamlesh Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.

5. A text book of English Phonetics for Indian Students by T.Balasubramanian (Macmillan), 18th Reprint, 2005.

6. English Skills for Technical Students**,** WBSCTE with British Council, OL

ENGINEERING WORKSHOP

Course Code : AMT1101

L	T	P	C
0	0	3	2

Aim : To provide hands on experience on basic Engineering and IT related skills.

Objectives :

* To train the student in the basics of computer components, maintenance, software(s) installation and office tools.
* To demonstrate and train the students in basic professional trades.

Compulsory Exercises :

- Identification of the peripherals of a computer, components in a CPU and its functions - Block diagram of the CPU along with the configuration of each peripheral. Disassembly and assembly of a personal computer.
- Installation of MS windows on the personal computer.
- One lamp controlled by a one-way switch and (b) Two-way switching for stair-case lamp

Any Nine Exercises From The Following :

- **Carpentry**: Making a Cross-half lap joint using wooden pieces
- **Carpentry**: Making a Mortise and Tenon joint using wooden pieces
- **Fitting**: Preparation of a V-fit between mild steel flat pieces
- **Fitting**: Preparation of a Square-fit between mild steel flat pieces

- **Foundry**: Preparation of a sand mould using a single piece pattern
- **Foundry**: Preparation of a sand mould using a split piece pattern
- **Tin-Smithy**: Preparation of a sheet metal pipe-joint using tin-smithy tools
- **Tin-Smithy**: Preparation of a sheet metal funnel using tin-smithy tools
- **Welding**: Making a Lap joint through arc welding
- **Lathe Machine**: Demonstration of turning related activities on Lathe machine
- **Black smithy**: Demonstration of Black smithy trade
- **Plumbing**: Demonstration of Plumbing trade
- **Installation of Linux** on the computer wherein the windows was installed. The system should be configured as dual boot with both windows and Linux.
- **Hardware Troubleshooting :** Identification of the problem of a PC which does not boot (due to improper assembly or defective peripherals) and fixing it to get the computer back to working condition.
- **Software Troubleshooting :** Identification of the problem of a malfunctioning CPU (due to some system software problems) and fixing it to get the computer back to working condition.
- **Connectivity Boot Camp : C**onnectivity to the Local Area Network and accessibility to the Internet. TCP / IP setting.
- **Web Browsers, Surfing the Web : C**ustomization the web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

- **Using LaTeX and / word : C**reation of project certificate. Exposure to features like:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and / Word.
- **Creating project abstract :** Features to be covered are: Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.
- **Creating a Newsletter** : Features to be covered are : Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs
- **Creating a Feedback form** - Features to be covered are: Forms, Text Fields, Inserting objects, Mail Merge in Word.
- **Excel Orientation : Introduction of** Excel as a Spreadsheet tool, Using Excel –Accessing, overview of toolbars, saving excel files, Using help and resources
- **Creating a Scheduler -** Features to be covered are: Gridlines, Format Cells, Summation, auto fill, Formatting Text
- **Calculating GPA** - Features to be covered:- Cell Referencing, Formulae in excel – average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP
- **Performance Analysis** - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

- **Power point presentation**
- Exposure to basic power point utilities and tools (PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point, Hyperlinks, inserting Images, Clip Art, Audio, Video, Objects, Tables, Charts) .to create basic power point presentation.

PHYSICS AND CHEMISTRY LAB

Course Code : ABP1102

L	T	P	C
0	0	3	2

Aim : To give prerequisites in understanding the advanced Physics & Chemistry leading to applications in engineering field.

Objectives : Training the students to understand the principles, concepts helpful in doing laboratory classes individually. To mould them to solve any technical problem in general.

LIST OF PHYSICS EXPERIMENTS

Any **SIX** of the following experiments are to be performed during the semester

01. Determination of rigidity modulus of the material of a given wire– Torsional pendulum
02. Verification of laws of vibration of stretched string - Sonometer
03. Determination of radius of curvature of a given convex lens - Newton's rings
04. Determination of wavelength of spectral lines of a mercury spectrum - Diffraction grating
05. Study of frequency response of LCR series and parallel resonant circuits
06. Study of variation of magnetic field along a circular current carrying conductor – Stewart & Gee apparatus
07. Determination of Hall coefficient and carrier concentration - Hall effect

08. Study of I-V characteristics of a solar cell

09. Optical Fibers – Determination of numerical aperture and losses in fibers

10. Measurement of dielectric constant of material by Waveguide method

LIST OF CHEMISTRY EXPERIMENTS

Any **SIX** of the following experiments are to be performed during the semester.

1. Preparation of standard potassium dichromate and determination of ferrous iron.
2. Determination of hardness of water by EDTA method.
3. Determination of dissolved oxygen in water.
4. Determination of chlorides in water.
5. Determination of iron-II by potentiometric method.
6. Determination of viscosity of lubricant by viscometer.
7. Determination of flash and fire points of oils.
8. Determination of percentage residue of carbon in oils.
9. Determination of calorific value of solid fuels.
10. Colorometric determination of iron in cement.

References :

1. Vogel's text book of quantitative chemical analysis, 6th ed. J.Mendham Et.al., Pearson Education.
2. Chemistry practical lab manual by Dr. K. B. Chandrasekhar
3. Laboratory Manual on Engineering Chemistry by K.Sudha Rani

SYLLABI FOR III SEMESTER

PROBABILITY, STATISTICS AND NUMERICAL METHODS

Course Code : ABM1103

L	T	P	C
4	1	0	4

Aim : To acquire basic knowledge in concepts of Probability Statistics and Numerical Computation.

Objective : The student shall be able to apply the methods of Probability distributions, perform Statistical analysis and draw inference in various Engineering problems and also shall be able to apply methods of Numerical Computation for real time problems.

Pre requisites : Basic concepts of Probability and calculus.

UNIT - I

RANDOM VARIABLES - Discrete distribution - continuous distribution - expectation-moment generating function – probability generating function.

(26.7, 26.8, 26.9, 26.10, 26.11, 26.12)

UNIT - II

DISTRIBUTIONS - Binomial distribution - Poisson distribution - normal distribution - probable error – Normal approximation to Binomial distribution

(26.13, 26.14, 26.15, 26.16, 26.17, 26.18)

UNIT - III

SAMPLING DISTRIBUTION – Test of Hypothesis – test of significance for large samples – sampling distribution of the mean – central limit theorem – confidence limits for unknown mean – Test of significance for to large samples

(27.1 to 27.12)

UNIT - IV

SAMPLING OF VARIABLES-SMALL SAMPLES – Students t-distribution – significance test of a sample mean - significance test of difference between sample means – Chi square test – Goodness of fit

(27.13, 27.14, 27.15, 27.16, 27.17, 27.18)

UNIT - V

SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATION – Bisection method – Regula Falsi – Newton Raphson method, deductions from Newton Raphson method – finite differences – differences of polynomial - other difference operators.

(28.1, 28.2, 28.3, 29.1, 29.2, 29.4)

UNIT - VI

INTERPOLATION - Newton's forward interpolation – Newton's backward interpolation – Interpolation with unequal intervals : Lagrange's interpolation - Newton's divided difference interpolation

(29.5, 29.8)

UNIT - VII

NUMERICAL DIFFERENTIATION - derivatives using Newton's forward difference formula - derivatives using Newton's backward difference formula.

NUMERICAL INTEGRATION –Newton cotes formula - Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule – weddle's rule.

(29.10(1,2), 29.12)

UNIT - VIII

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS - Picard's method - Solution by Taylor's series - Euler's Method – Modified Euler's method - Runge-Kutta Method.

(31.1, 31.2, 31.3, 31.4, 31.5, 31.7)

Text Book :

1. Dr.B.S.Grewal "Higher Engineering Mathematics", 40th Edition, Khanna Publishers

References :

1. Probability and statistics for engineers**:** Erwin Miller and John E.Freund. Prentice-Hall of India / Pearson, Sixth edition.
2. Introductory methods of Numerical Analysis: S.S .Sastry / PHI, Fourth edition.

STRENGTH OF MATERIALS – I

Course Code: ACE1104

L	T	P	C
4	1	0	4

Aim:

To study the member / beam behavior subjected various forces and analysis of cylinders.

Scope:

Understanding various concepts of behavior of materials, analysis of stresses, deflection criteria and stress behavior in cylinders.

UNIT–I

ANALYSIS OF PIN-JOINTED PLANE FRAMES: Determination of Forces in members of plane, pin-jointed, perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever and simply – supported trusses.- by method of joints, method of sections.

UNIT-II

SIMPLE STRESSES AND STRAINS: Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic constants and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

UNIT–III

STRAIN ENERGY: Resilience – Gradual, sudden, impact and shock loadings – simple applications.

UNIT–IV

SHEAR FORCE AND BENDING MOMENT: Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, U.D.L., uniformly varying loads and

combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT–V

FLEXURAL STRESSES: Theory of simple bending – Assumptions – Derivation of bending equations, Neutral axis – Determination of bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

UNIT–VI

SHEAR STRESSES: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

UNIT–VII

DEFLECTION OF BEAMS: Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L. Uniformly varying load.- Mohr's theorems – Moment area method – application to simple cases.

UNIT–VIII

THIN CYLINDERS: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Thin spherical shells.

Text Books:

1. Introduction to text book of Strength of materials by R.K.Bansal – Laxmi publications Pvt. Ltd., New Delhi.
2. Strength of Material by Sadhu Singh, Khanna publications.
3. Strength of Materials by S. Ramamrutham and R.Narayanan – Dhanpat Rai publications.
4. Mechanics of Materials by Popov

References:

1. Mechanics of Solid, by Ferdinandp Beer and Johnston – Tata Mc.Grawhill Publications 2000.
2. Strength of Materials by Schaum's out line series – Mc. Grawhill International Editions.
3. Strength of materials by R. Subramanian, Oxford university press, New Delhi
4. Strength of Materials by Bhavi Katti.
5. Mechanics of Materials by Timoshenko & Gere
6. Strength of Materials by Timoshenko & Young

MECHANICS OF FLUIDS

Course Code: ACE1105

L	T	P	C
4	1	0	4

Aim:

To introduce the concepts of Fluid Mechanics (along with simple applications) and fluid flow measurements. It is a first level course and a prerequisite for many other courses.

Scope:

To attain basic knowledge of ideal and real fluid properties and their behaviour in static and dynamic conditions along with simple applications.

UNIT I

INTRODUCTION: Dimensions and units – Physical properties of fluids, specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion- fluid continuum- pressure at a point, Pascal's law, Hydrostatic law - atmospheric, gauge and vacuum pressure- measurement of pressure, Pressure gauges, Manometers: differential and Micro Manometers.

UNIT – II

HYDROSTATIC FORCES: Hydrostatic forces on submerged plane (Horizontal, Vertical, inclined) and curved surfaces – Center of pressure. Derivations and problems.

UNIT – III

FLUID KINEMATICS: Description of fluid flow, velocity, acceleration – convective, local and total, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrrotational flows – Equation of continuity- one, two , three dimensional flows – stream and velocity potential functions, flownet analysis.

UNIT – IV

FLUID DYNAMICS: Surface and body forces, Lagrangean and Eularian approaches – Concepts of fluid system and control volume – control volume approach for fluid flow problems – Euler's and Bernoulli's equations for flow along a stream line for 2-D flow, Momentum equation and its application – forces on pipe bend.

UNIT – V

VISCOUS FLOW: Navier – stokes equations (Explanatory) ,Reynolds experiment – Classification of Laminar & Turbulent flows, Flow between parallel plates, Flow through long pipes.

UNIT – VI

BOUNDARY LAYER (BL) THEORY: Concepts, Prandtl's contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen momentum integral equation, laminar and turbulent Boundary layers (no derivations) BL in transition, separation of BL, control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

UNIT – VII

CLOSED CONDUIT FLOW: Laws of Fluid friction – Darcy's equation, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line, Pipe network problems, variation of friction factor with Reynolds number – Moody's Chart.

UNIT – VIII

MEASUREMENT OF FLOW: Pitot tube, Venturi meter and orifice meter – classification of orifices, flow over rectangular, triangular and trapezoidal and Stepped notches - –Broad crested weirs.

Text Books:

1. Fluid Mechanics (9th Edn) by V.L.Streeter, Benjamin Wiley and Bedford, Mc Graw Hill Book company (Asian Students Edition)
2. Fluid mechanics and hydraulic machinery by Modi P.N and S.M. Seth.
3. Fluid Mechanics by K.L. Kumar

References:

1. Fluid Mechanics by Frank.M. White (Tata Mc.Grawhill Pvt. Ltd.)
2. Fluid Mehanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi
3. Fluid Mechanics (LPE) by J.F. Douglas, J.M. Gasirock and J.A. Swaffield (Pearson Education Publishers)
4. Fluid Mechanics by A.K.Jain

BUILDING MATERIALS AND CONSTRUCTION

Course Code: ACE1106

L	T	P	C
4	1	0	4

Aim:

To acquire basic knowledge in different materials used in construction.

Scope:

The student shall have basic understanding of various materials like bricks, stones, tiles. The student shall also basic knowledge in various types of foundations, damp proofing materials.

UNIT – I

BRICKS & STONES: Properties of building stones – relation to their structural requirements. Classification of stones – Stone quarrying – precautions in blasting, Dressing of stone, Composition of good brick earth, Qualities of a good brick , various methods of manufacture of bricks. Comparison between clamp burning and kiln burning.

Other types of bricks

UNIT-II

FERROUS AND NON-FERROUS METALS: Ferrous metals, Desirable characteristics of reinforcing steel. Principles of cold working. Detailed Discussion on reinforcing steel, mechanical and physical properties chemical composition.

Aluminum- Brief description on properties and uses.

UNIT – III

TIMBER: Timber Structure – properties – Seasoning of timber, Classification of various types of timbers used in buildings – Defects in timber. Preservation of timber, fire resistance of timber and testing of timber

UNIT-IV

OTHER BUILDING MATERIALS: Characteristics of good tile – manufacturing methods, Types of tiles. Uses and testing of tiles. Gypsum- Properties , building products of gypsum and uses. Glass–ingredients, properties, types and uses.Insulating materials – thermal and sound insulating materials, desirable properties and types.Fiber-reinforced plastics and its uses

UNIT - V

MASONRY: Brick masonry – bonding of bricks, method of laying of bricks, inspection of brick work, construction of half brick masonry wall, height of walls in brick masonry and brick piers.

Stone masonry – classification of stone masonry – Random Rubble, coursed rubble and ashlar masonry.

UNIT – VI

FOUNDATIONS: Width & depth of the foundation- Foundation for a load bearing wall. Foundations of framed buildings- Shallow foundations – Spread, combined- strap and mat foundations.

UNIT –VII

BUILDING COMPONENTS: Lintels, Arches, Vaults-Staircases – Types. Different types of flooring-Concrete, Mosaic, Terrazo floors; Different types of roofs-Pitched, flat and curved Roofs. Lean-to-Roof, Coupled Roofs, Trussed roofs- King and Queen Post Trusses. Doors & Windows – Types, sizes and rate.

UNIT – VIII

OTHER CONSTRUCTION TECHNIQUES: Damp Proofing and water proofing- materials used- specifications of DPC in walls, Basic principles of water proofing of basements, Plastering, pointing, white washing, distempering and painting. Form work and scaffolding.

Text Books:

1. Building material by S K Duggal – New Age International Publishers; Second Edition
2. Building Construction by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi
3. Building Construction by P.C. Varghese, Prentice-Hall of India private Ltd, New Delhi

References:

1. R.Chudly "Construction Technology "– Volumes I and II" 2nd Edition, Longman, UK, 1987.
2. Building materials by P.C. Varghese, Prentice-Hall of India private Ltd, New Delhi

ENGINEERING GEOLOGY

Course Code: ACE1107

L	T	P	C
4	0	0	4

Aim:

To impart basic concepts of engineering geology that are required by Civil Engineer.

Scope:

The student shall have basic understanding of petrology, mineralogy, structural geology, geology of dams, tunnels and reservoirs.

UNIT - I

INTRODUCTION: Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological draw backs. Importance of Physical geology, Petrology and Structural geology.

WEATHERING OF ROCKS: Its effect over the properties of rocks importance of weathering with reference to dams, reservoirs and tunnel locations. Weathering profiles of products of granite.

UNIT - II

MINERALOGY: Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Physical properties of Minerals. Study of physical properties of following common rock forming minerals: Feldspar, Quartz , Flint , Jasper, Olivine , Augite , Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of other common economic minerals such as Pyrite, Hematite , Magnetite, Chromite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.

UNIT - III

PETROLOGY:

DEFINITION OF ROCK : Geological classification of Igneous, Sedimentary and Metamorphic rocks. Dykes and sills, common structures

and textures of Igneous, Sedimentary and Metamorphic rocks. Their distinguishing features, Megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT - IV

STRUCTURAL GEOLOGY: Out crop, strike and dip Study of common geological structures associating with the rocks such as folds, faults, unconformities and joints - their important types. Insitu and drift soils, common types of soils, their origin and occurrence in India, Stabilisation of soils.

UNIT - V

Earthquakes, their causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Land slides, their causes and effect; measures to be taken to prevent their occurrence. Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration.

UNIT – VI

GEOPHYSICAL INVESTIGATION: Importance of Geophysical studies, Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods. Importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc.

UNIT – VII

GEOLOGY OF DAMS AND RESERVOIRS: Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factor's contributing to the success of a reservoir. Geological factors influencing water, Lightness and life of reservoirs.

UNIT - VIII

Tunnels: Purposes of tunneling, Effects of Tunneling on the ground, Role of Geological Considerations (ie. Lithological, structural and ground water) in tunneling over break and lining in tunnels. Engineering classification

of Rock Masses. Strength modulus ; Rock quality designation, Rock structure rating, Rock mass rating system, Rock quality index system.

Text Books:

1) Principles of Engineering Geology by K.V.G.K. Gokhale – B.S publications, 2009.

2) Engineering Geology by N.Chennkesavulu, Mc-Millan, India Ltd. 2005.

3) Engineering and General Geology by Parbin Singh, SK Katria & Sons, 2009.

References:

1. F.G. Bell, Fundamentals of Engineering Geology, Butterworths, Publications, New Delhi, 1992.

2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution,

ELEMENTS OF ELECTRICAL ENGINEERING AND MECHANICAL ENGINEERING

Course Code: ACE1108

L	T	P	C
4	0	0	4

Aim:

The aim of the course is to reach the basic fundamental concepts of Electrical and Mechanical Engineering.

Scope:

Basic Electrical and Mechanical Engineering is a basic fundamental course for discipline of Civil Engineering, so that students will have to understand its significance.

Electrical:

UNIT-I

FUNDAMENTALS OF ELECTRICAL ENGINEERING: Basic circuit elements – Resistance, Inductance and capacitance –Ohm's law Kirchoff's laws-Faraday's law of Electromagnetic Induction.

FUNDAMENTALS OF AC: Average and effective value-series RL and RC circuits – Active power, Reactive power, Apparent power, Power Factor – Simple Problems.

UNIT II

TRANSFORMERS: Single phase and Three phase transformers-Operation and Construction, EMF equation, losses and efficiency-Simple Poblems.

UNIT III

MEASURMENTS OF ELECTRICAL QUANTIITES: Types of instruments (indicating , intergrating,Recording), Basi Principles of indicating Instruments-Moving Coil and Moving iron Instruments (Ammeters and Voltmeters) Watt meters and Energy meters. Measurement of Insulation Resistance.

UNIT IV

INDUCTION MOTORS: Construction and Principle of operation of three phase induction motor-Torque slip characteristics-applications.

ALTERNATORS: Principle of operation of alternators –Types of alternators, Mechanical:

UNIT –V

MACHINE TOOLS: Lathe, Drilling, milling, shaper and planer description – function of various parts – applications.

UNIT- VI

THERMAL ENGINEERING: IC Engines – Classification and working principles diesel and petrol engines – two stroke and four stroke engines comparison Refrigeration : Block diagram – working principle – refrigeration and properties – Basic principles of air conditioning

UNIT - VII

WELDING: Introduction – classification – arc welding – gas welding – Equipment and materials required for arc and gas cutting

UNIT – VIII

BELTS ROPE AND CHAIN DRIVES: BELT : Introduction , open and crossed belt drives, length of belt, slip, centrifugal tension, limiting ratio of tensions for flat and V- belts, power transmitted

ROPES : Introduction, ratio of driving tensions

CHAINS : Length of chain, power transmitting chains, conveyor chains

FINAL EXAMINATION PATTERN: The end examination paper should consist of Part A and Part B. Part A consist of five questions in Electrical Engineering portion out of which Question No. 1 is compulsory and two questions out of the rest are to be answered. Part B consist of five questions in Mechanical Engineering portion out of which Question No. 1 is compulsory and two questions out of the rest are to be answered. Weight age for Part – A is50% and Part- B is 50%.

Text Books:

1. V.K.Mehta and Rohit Mehta, " Principles of Electrical Engineering", S Chand Publications.
2. M.S.Naidu and S Kamakshaiah, " Electrical Technology ", TMH Publishers.
3. Mechanical Technology by C P Kondandaraman
4. Mechanical Technology by Mathur & Domkundwar
5. Theory of Machines by Khurmi & Gupta (for unit VIII) S Chand & Co

References:

1. I.J.Nagrath and D.P. Kothari, "Theory and Problems and Basic Electrical Engineering", PHI Publications.
2. David V.Kerns, JR J. David Irwin, "Essentials of Electrical and Computer Engineering".
3. Vincent Del Toro, "Electrical Engineering Fundamentals", PHI Publishers second Edition.

STRUCTURAL ENGINEERING LAB

Course Code: ACE1109

L	T	P	C
0	0	3	2

Aim:

To enhance the knowledge gained in theory and have demonstration of various stresses.

Scope :

To have basic knowledge of stresses under various loading conditions. To find material properties of wood, steel and bricks.

Experiments:

1. Tension test.
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simply supported beam.
4. Torsion test.
5. Hardness test.
6. Spring test.
7. Compression test on wood.
8. Impact test.
9. Shear test.
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges.
12. Compression test on Bricks.

ENGINEERING GEOLOGY LAB

Course Code: ACE1110

L	T	P	C
0	0	3	2

Aim:

To enhance the knowledge gained in theory through study and interpretation.

Scope:

The student shall be able to identify rocks and minerals, draw and interpret sections of geological maps and solve simple structural geology problem.

1. Study of physical properties and identification of Rock forming minerals.
2. Study of physical properties and identification of Economic minerals.
3. Megascopic description and identification of Igneous rocks.
4. Megascopic description and identification of Sedimentary rocks.
5. Megascopic description and identification of Metamorphic rocks.
6. Interpretation and drawing of sections for geological maps showing tilted beds.
7. Interpretation and drawing of sections for geological maps showing tilted faults beds.
8. Interpretation and drawing of sections for geological maps showing tilted uniformities.
9. Structural Geology problems – Simple strike problems.
10. Structural Geology problem – Dip problems.

SYLLABI FOR IV SEMESTER

STRENGTH OF MATERIALS – II

Course Code: ACE1111

L	T	P	C
4	1	0	4

Aim:

To study the principal stresses and analysis of compression members.

Scope : Understanding the behaviors of the member subjected to various stresses, analysis of columns and combined direct and bending stresses.

UNIT-I

PRINCIPAL STRESSES AND STRAINS: Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains – Analytical and graphical solutions.

UNIT – II

THEORIES OF FAILURES: Introduction – Various Theories of failures like Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

UNIT – III

TORSION OF CIRCULAR SHAFTS: Theory of pure torsion – Derivation of Torsional Rigidity equation – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

UNIT – IV

SPRINGS: Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel – Carriage or leaf springs.

UNIT – V

COLUMNS AND STRUTS: Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler's theorem for long columns- assumptions- derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler's critical stress – Limitations of Euler's theory – Rankine – Gordon formula – Long columns subjected to eccentric loading – Secant formula – Empirical formulae – Straight line formula – Prof. Perry's formula.

UNIT – VI

DIRECT AND BENDING STRESSES: Stresses under the combined action of direct loading and B.M,. core of a section – determination of stresses in the case of chimneys, retaining walls and dams – conditions for stability – stresses due to direct loading and B.M. about both axis.

UNIT – VII

UNSYMETRICAL BENDING: Introduction – Centroidal principal axes of section – Graphical method for locating principal axes – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis Deflection of beams under unsymmetrical bending.

UNIT – VIII

THICK CYLINDERS: Introduction Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

Text Books:

1. A Text book of Strength of materials by R.K.Bansal –Laxmi Publications (P) ltd., New Delhi
2. Strength of Material by Sadhu Singh, Khanna publications.
3. Strength of Materials by S. Ramamrutham and R.Narayanan – Dhanpat Rai publications.

References:

1. Mechanics of Solid, by Ferdinandp Beer and Johnston – Tata Mc.Grawhill Publications 2000.
2. Strength of Materials by Schaum's out line series – Mc. Graw hill International Editions.
3. Strength of materials by R.K.Rajput, S.Chand & Co, New Delhi.
4. Strength of Materials by A.R.Basu, Dhanpat Rai & Co, Nai Sarah, New Delhi.
5. Strength of Materials by L.S.Srinath et al., Macmillan India Ltd., Delhi.
6. Mechanics of Structures, by S.B. Junnarkar, Charotar Publishing House, Anand, Gujrat.

HYDRAULICS AND HYDRAULIC MACHINERY

Course Code: ACE1112

L	T	P	C
4	1	0	4

Aim:

To provide necessary theoretical background to study the courses in Water Resources Engineering, Hydropower Engineering and Environmental Engineering fields.

Scope:

To provide necessary back ground for understanding the behaviour of flow of water in channels and rivers, and the working principles of Turbines and Centrifugal Pumps.

UNIT – I

DIMENSIONAL ANALYSIS & SIMILITUDE: Dimensional analysis-Rayleigh's method and Buckingham pi theorem-study of Hydraulic models–Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations.

UNIT-II

BASICS OF TURBO MACHINERY: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle, Applications to radial flow turbines.

UNIT – III

HYDRAULIC TURBINES–I: Layout of a typical Hydropower installation – Heads and efficiencies-classification of turbines-Pelton wheel-Francis turbine-Kaplan turbine-working, working proportions, velocity diagram, work done and efficiency, hydraulic design.

UNIT – IV

HYDRAULIC TURBINES–II: Draft tube – theory and function efficiency, modern developments of turbines, Governing of turbines-Runaway speed of turbines - surge tanks –water hammer.

UNIT – V

PERFORMANCE OF TURBINES: Performance under unit and specific head -unit speed-unit quantity-unit power-specific speed - performance characteristics -cavitation,

UNIT – VI

CENTRIFUGAL PUMPS : Pump installation details-classification-work done- Manometric head-minimum starting speed-losses and efficiencies-specific speed - multistage pumps-pumps in series and parallel-performance of pumps-characteristic curves- NPSH-cavitation.

UNIT – VII

OPEN CHANNEL FLOW-I: Types of flows – Type of channels – Velocity distribution – Energy and momentum correction factors – Chezy's, Manning's; and Bazin formulae for uniform flow – Most Economical sections.

Critical flow: Specific energy-critical depth – computation of critical depth – critical sub-critical and super critical flows.

UNIT – VIII

OPEN CHANNEL FLOW II: Non uniform flow-Dynamic equation for gradually varied flow Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method- Rapidly varied flow, hydraulic jump, energy dissipation.

Text Books:

1. Fluid Mechanics (9th Edn) by V.L.Streeter, Benjamin Wiley and Bedford, Mc Graw Hill Book company (Asian Students Edition)
2. Fluid mechanics and hydraulic machinery by Modi P.N and S.N. Seth.
3. Open Channel Flow by Subramanya. K.

References:

1. Open Channel Flow by Ven Te Chow – Mc Graw Hill Book company.
2. Fluid Mehanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi
3. A textbook of Fluid mechanics and hydraulic machines by Dr. R.K. Bansal - Laxmi Publications (P) Ltd., New Delhi.
4. Fluid Mechanics by Frank.M. White (Tata Mc.Grawhill Pvt. Ltd.)
5. Open Channel Flow by Srivatsava (Oxford publishers)
6. Fluid Mechanics (LPE) by J.F. Douglas, J.M. Gasirock and J.A. Swaffield (Pearson Education Publishers)

CONCRETE TECHNOLOGY

Course Code: ACE1113

L	T	P	C
4	0	0	4

Aim:

To impart basic knowledge on manufacturing and performance of ordinary and some special concretes.

Scope:

To learn the properties of various ingredients of concrete, To understand the concept of workability and Study various tests on concrete, to know about various types of concrete.

UNIT-I :

CONSTITUENTS OF CONCRETE

Concrete as a Building Material

Cement : Chemical Composition, Chemical and Physical processes of Hydration, Structure of Hydrated Cement, Blended Cements, Properties of cement and their effect on properties of Concrete. (test procedures not required)

Aggregates : Classification, Mechanical, Physical and Thermal properties of Fine and Course aggregates that effect the properties of concrete. (test procedures not required)

Quality of mixing water : Specifications for quality of mixing water and Curing water (test procedures not required)

UNIT – II:

MANUFACTURING OF CONCRETE AND SPECIAL PROCESSES OF CONCRETING

Manufacture of Concrete : Mixing – Transporting – Placing – Compacting – Curing. Safe Stripping Time.

Special Processes of Concreting : Hot and cold weather concreting – Sprayed Concrete – Underwater Concrete –Grouted concrete – Mass concrete – Pumped concrete – Concrete for Liquid Retaining Structures – Slip form construction – Concrete coatings & surface treatments.

UNIT – III:

FRESH CONCRETE:

Properties of Fresh Concrete : need for study

Workability : Definition, Factors affecting workability, significance, Tests available for measurement (test procedures not required)

Segregation and Bleeding : Definitions – causes and effects, measurement – Laittance, Factors effecting performance of Hardened concrete, Water/ Cement Ratio, Abram's law, Powers law, Gel space ratio, Maturity concept.

UNIT – IV:

HARDENED CONCRETE:

Properties of Hardened concrete : Compressive strength – Tensile Strength – Flexural Strength – Young's Modulus and Poissons ratio, Deformation characterstics: Creep – Shrinkage – Soundness & Thermal properties, Durability.

UNIT – V:

TESTING OF HARDENED CONCRETE QUALITY CONTROL : Destructive, partially destructive and Non destructive testing of concrete, codal provisions, relationship between tensile strength and compressive strength, cube strength and cylinder strength.

Variability of Concrete Strength, Concept of Quality, Stages and means of Control, Statistical methods of measuring Variability, Acceptance Criteria, applications.

UNIT – VI:

ADMIXTURES :

Mineral Admixtures : Flyash, GGBS, Silica Fume – origin and manufacture, Chemical Composition, Chemical and Physical processes of hydration, effects on properties of concrete.

Chemical Admixtures : Classification, origin and manufacture, chemical composition, actions and interactions, applications.

UNIT – VII:

SPECIAL CONCRETES-I : Plain concrete – Reinforced Concrete – Prestressed Concrete – Light weight concrete – Cellular concrete – No fines concrete – Aerated and foamed concrete – Smart Concrete – Fiber reinforced concrete – Polymer concrete – Flyash concrete – Self compacting concrete.

UNIT – VIII :

SPECIAL CONCRETES-II: High performance concrete – Very high strength concete – High density concrete – Lime concrete – Sulpher impregnated concrete – Refractory concrete – Radiation shielding concrete – Recycled concrete – Roller compacted concrete.

Text Books:

1. Concrete Technology – A.M.Neville, J.J.Brookes, Pearson Education
2. Concrete Technology – M.S.Shetty, S.Chand Publication

References:

1. Properties of Concrete – A.M.Neville
2. Concrete Technology- A.R.Shanta Kumar, Oxford University press, New Delhi
3. Design of Concrete Mixes – N.Krishna Raju, CBS Publishers and distributors.
4. Concrete Technology- M.L.Gambhir, Tata McGrawhill Publishers, New Delhi

BUILDING PLANNING, SERVICES AND DRAWING

PART-A

Course Code: ACE1114

L	T	P	C
3	0	2	4

Aim :

To understand the various planning principles and have basic knowledge on building drawing.

Scope:

Student shall have basic knowledge different building bye-laws. The student shall have basic understanding on various planning principles of residential and public buildings.

UNIT – I

BUILDING BYELAWS AND REGULATIONS: Introduction – Terminology – Objectives of building byelaws – Floor area ratio (FAR) – Floor space Index (FSI) – Principles underlying building byelaws – classification of buildings – Open space requirements – built up area limitations – Height of Buildings – Wall thickness – lighting and ventilation requirement.

UNIT – II

RESIDENTIAL BUILDINGS: Minimum standards for various parts of buildings – requirements of different rooms and their grouping – characteristics of various types of residential buildings.

UNIT – III

PUBLIC BUILDINGS: Planning of Educational institutions, hospitals, dispensaries, Office buildings, banks, industrial buildings, hotels and motels, buildings for recreation.

UNIT – IV

Components of building automation system - HVAC, electrical lighting

Components of building automation system - Security, fire-fighting, communication etc.,

PART-B

UNIT – V

SIGN CONVENTIONS AND BONDS: Brick, Stone, Plaster, Sand filling, Concrete, Glass, Steel, Cast iron, Copper alloys, Aluminium alloys etc., Lead, Zinc, tin, white lead etc., Earth, Rock, Timber and Marble. English bond & Flemish bond, odd & even courses for one, one and half, two and two and half brick walls in thickness at the junction of a corner.

UNIT – VI

DOORS WINDOWS, VENTILATORS AND ROOFS: Paneled Door – paneled and glazed door, glazed windows – paneled windows – Swing ventilator – Fixed ventilator-Couple roof – Collar roof – King Post truss – Queen post truss.

UNIT – VII

Sloped And Flat Roof Buildings

UNIT – VIII

Given line diagram with specification to draw, plan, sections section and elevation

FINAL EXAMINATION PATTERN: The end examination paper should consist of Part A and Part B. Part A consist of five questions in planning portion out of which three questions are to be answered. Part B should consist of two questions from drawing part out of which one is to be answered in drawing sheet. Weight age for Part – A is 50% and Part- B is 50%.

Text Books:

1. 'A' Series & 'B' Series of JNTU Engineering College, Anantapur,
2. Building Planning and Design – N.Kumarswamy and A.Kameswara Rao
3. Building Planning Scheduling and Design – Gurucharan Singh

References:

1. Building by laws bye state and Central Governments and Municipal corporations. National Building Code

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: AHM1101

L	T	P	C
4	0	0	4

Objective

To explain the basic principles of managerial economics, accounting practices and financial management techniques for effective business decision making and to promote entrepreneurial abilities among budding engineers

Outcome

To understand the economic environment and to give an idea on various accounting and
financial management techniques for effective utilization of economic resources

UNIT I

INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope of Managerial Economics, Demand Analysis, Demand Determinants, Law of Demand and its exceptions

UNIT II

ELASTICITY OF DEMAND AND DEMAND FORECASTING

Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, Methods of demand forecasting (Survey method, Statistical method, Expert opinion method, Test marketing, Controlled experiment, Judgmental approach)

UNIT III

THEORY OF PRODUCTION AND COST ANALYSIS : Production Function – Isoquants and Isocosts, Laws of returns, Internal and External Economies of Scale

COST ANALYSIS: Types of Costs, Break Even Analysis (BEA) – Determination of Break Even Point (Simple numerical problems) – managerial significance and limitations of BEA

UNIT IV
INTRODUCTION TO MARKETS

Market Structures: Types of competition, features of perfect competition, monopoly and monopolistic competition, price output determination in case of perfect competition and monopoly

UNIT V
FORMS OF BUSINESS ORGANIZATIONS

Features of Business, Advantages, Limitations of Sole Proprietorship, Partnership and Joint Stock Company

UNIT VI
INTRODUCTION TO FINANCIAL ACCOUNTING

Accounting: Principles, concepts, conventions, double entry book keeping, Journal, Ledger

Trial Balance, Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments, international financial reporting standards (simple numerical problems)

UNIT VII
FINANCIAL ANALYSIS THROUGH RATIOS

Introduction, Advantages and limitations, Computation, Analysis and Interpretation of Liquidity ratios, Activity ratios, Solvency ratios and Profitability ratios (simple numerical problems)

UNIT VIII
BUDGETING AND CAPITAL BUDGETING

Introduction to Budgeting: Production budget, Flexible budget and Cash budget

Definition, nature and scope of capital budgeting, features of capital budgeting proposals, methods of capital budgeting: Traditional and discounted methods (simple numerical problems)

Text Books:

1. **Aryasri :** Managerial Economics and Financial Analysis, Tata McGraw Hill, 3/e,2009
2. **Siddiqui and Siddiqui :** Managerial Economics and Financial Analysis, New Age Publishers, 1/e, 2005

Reference Books:

1. R L Varshney and K L Maheswari: Managerial Economics, Sultan Chand & Sons
2. D Ragnunath Reddy & M V Narasimha Chary: Managerial Economics and Financial Analysis, SciTech Publications
3. Dwivedi: Managerial Economics, Vikas Publishers
4. P K Sharma and Shashi K Gupta: Management Accounting, Kalyani Publishers
5. S P Jain and K L Narang: Financial Accounting, Kalyani Publishers
6. Bhattacharya: Management Accounting, Pearson Education
7. P L Mehta: Managerial Economics, Sultan Chand & Sons

STRUCTURAL ANALYSIS – I

Course Code: ACE1115

L	T	P	C
4	0	0	4

Aim:

To improve the basic principles for analysis of statically indeterminate structuresubjected to static loads and determinate structures subjected to moving loads.

Scope:

The student shall be able to analyse (i) propped cantilevers, fixed beams, continuous beams by different methods. (ii) Simply supported beams and trusses subjected to moving loads.

UNIT – I

PROPPED CANTILEVERS : Analysis of propped cantilevers - Shear force and Bending moment diagrams-Deflection of propped cantilevers.

UNIT – II

FIXED BEAMS: Introduction to statically indeterminate beams with U.D.L, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads, shear force and Bending moment diagrams-Deflection of fixed beams, effect of sinking of support, effect of rotation of a support.

UNIT – III

CONTINUOUS BEAMS : Introduction-Clapeyron's theorem of three moments- Analysis of continuous beams with constant moment of inertia with one or both ends fixed-continuous beams with overhang, continuous beams with different moment of inertia for different spans-Effects of sinking of supports-shear force and Bending moment diagrams.

UNIT-IV

TRUSSES: Analysis of trusses using tension –coefficient method.

UNIT – V

ENERGY THEOREMS: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces – Castigliano's first theorem-Deflections of simple beams and pin jointed trusses.

UNIT – VI

MOVING LOADS: Introduction, maximum S.F and B.M at a given section and absolute maximum S.F. and B.M due to single concentrated load, U.D.L longer than the span, U.D.L shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length.

UNIT – VII

INFLUENCE LINES: Definition of influence line for S.F, Influence line for B.M- load position for maximum S.F at a section -Load position for maximum B.M at a section, single point load, U.D.L longer than the span, U.D.L shorter than the span- Influence lines for forces in members of Pratt and Warren trusses.

UNIT –VIII

INDETERMINATE STRUCTURAL ANALYSIS:

Indeterminate Structural Analysis –Determination of static and kinematic indeterminacies –Solution of trusses with upto one degrees of internal and external indeterminacies –Castigliano's theorem

Text Books:

1. Analysis of Structures-Vol I & Vol II by V.N. Vazirani & M.M.Ratwani, Khanna Publications, New Delhi.
2. Analysis of Structures by T.S. Thandavamoorthy, Oxford University Press, New Delhi
3. Comprehensive Structural Analysis-Vol.I&2 by Dr. R. Vaidyanathan & Dr. P.Perumal- Laxmi publications pvt. Ltd., New Delhi

4. Basic structural Analysis by C.S. Reddy, Tata Mcgrawhill, New Delhi

References:

1. Mechanics of Structures by S.B.Junnarkar, Charotar Publishing House, Anand, Gujrat
2. Theory of Structures by Gupta, Pandit & Gupta; Tat Mc.Graw – Hill Publishing Co.Ltd., New Delhi.
3. Theory of Structures by R.S. Khurmi, S. Chand Publishers
4. Strength of Materials and Mechanics of Structures- by B.C.Punmia, Khanna Publications, New Delhi.
5. Introduction to structural analysis by B.D. Nautiyal, New age international publishers, New Delhi

FLUID MECHANICS LAB

Course Code: ACE1116

L	T	P	C
0	0	3	2

Aim:

To introduce concepts of fluid flow and hydraulic machines to make the students gainful.

Scope:

To Gain basic knowledge on Fluid Statics, Fluid Dynamics, closed conduit flows and know the basic machinery with their efficiencies. Create much awareness on Turbines, Pumps and their performances.

1. EXPERIMENTS:

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice by a constant head method.
3. Determination of Coefficient of discharge for an external mouth piece by variable head method.
4. Calibration of contracted Rectangular Notch and Triangular Notch
5. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.
9. Performance test on Pelton wheel turbine
10. Performance test on Francis turbine.
11. Efficiency test on centrifugal pump.

CONCRETE TECHNOLOGY LAB

Course Code: ACE1117

L	T	P	C
0	0	3	2

Aim:

The Concrete Technology Laboratory focuses on the tests on different ingredients of Concrete, Fresh Concrete and hardened Concrete.

Objectives:

- To make students realize the importance of evaluating the quality of ingredients .
- To enable them to evaluate different properties of Cement, Fine aggregate and Course Aggregate
- To help students understand the importance of properties of Fresh and Hardened Concrete and their evaluation procedures.

LIST OF EXPERIMENTS

TESTS ON CEMENT

1. (a) Determination of Fineness of Cement.
   (b) Determination of Specific Gravity of Cement.
2. (a) Determination of Normal Consistency of Cement.
   (b) Determination of Initial and Final Setting time of Cement.
3. (a) Determination of Soundness of Cement.
   (b) Determination of Compressive Strength of Cement.

TESTS ON AGGREGATE

4. (a) Determination of Fineness Modulus and Zone of Sand.
   (b) Determination of Fineness Modulus of Course Aggregate.
5. (a) Determination of Bulk Density of Fine aggregate.
   (b) Determination of Bulk density of Course aggregate.

6 (a) Determination of Specific Gravity of Fine aggregate.

(b) Determination of Specific Gravity of Course Aggregate.

7. (a) Determination of Bulking of Sand.

(b) Determination of Water absorption of Course Aggregate.

TESTS ON FRESH CONCRETE

8. (a) Determination of Workability of Concrete by Slump Cone test.

(b) Determination of Workability of Concrete by Compaction Factor test (To cast a cube and Cylinder for testing after 7 or 14 days).

9. (a) Determination of Workability of Concrete by Vee-bee Consistometer test.

(b) Determination of Workability of Concrete by Flow table test. (To cast a prism and a cylinder for testing after 7 or 14 days).

TESTS ON HARDENED CONCRETE

10. (a) Determination of Compressive Strength and Youngs Modulus of Concrete cube.

(b) Determination of Compressive Strength and Youngs Modulus of Concrete cylinder.

11. (a) Determination of Flexural Tensile Strength of Concrete Prism.

(b) Determination of Split tensile strength of Concrete cylinder.

DEMONSTRATION

12. (a) Non-destructive testing of Concrete (Rebound hammer).

(b) Determination of moisture content in fine aggregate by Rapid moisture Metre.

SYLLABI FOR V SEMESTER

WATER RESOURCES ENGINEERING- I

Course Code: ACE 1118

L	T	P	C
4	1	0	4

Aim :

To provide the necessary background for understanding the occurence and movement of water in hydrosphere and to enable the student to understand Irrigation Engineering Principles and practices.

Scope :

To familiarize the student with the basics of Hydrology, Irrigation Principles and practices, and conveyance of irrigation water.

UNIT –I:

INTRODUCTION TO HYDROLOGY :

Introduction to Engineering hydrology and its applications, Hydrologic cycle, types and forms of precipitation, rainfall measurement, types of rain gauges, computation of average rainfall over a basin, processing of rainfall data.

UNIT-II:

DESCRIPTIVE HYDROLOGY :

Abstraction from rainfall-evaporation, factors affecting evaporation, measurement of evaporation-evapotranspiration-Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices. Runoff-components of runoff, factors affecting runoff, stream gauging, effective rainfall, separation of base flow.

UNIT-III:

HYDROGRAPH ANALYSIS :

Unit Hydrograph, definition, and limitations of applications of Unit hydrograph, derivation of Unit Hydrograph, S-hydrograph, IUH, Synthetic Unit Hydrograph.

UNIT-IV:

ESTIMATION OF FLOOD DISCHARGE :

Design Discharge, Computation of design discharge-rational formula, SCS method, flood frequency analysis-Gumbel's method, log Pearson III method, basic concepts of flood routing-hydraulic and hydrologic routing, channel and reservoir routing.

UNIT-V

GROUND WATER :

Ground water Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient, types of wells, Darcy's law, radial flow to wells in confined and unconfined aquifers.

UNIT-VI:

INTRODUCTION TO IRRIGATION :

Necessity and Importance of Irrigation, advantages and ill effects of Irrigation, types of Irrigation, methods of application of Irrigation water, Indian agricultural soils, methods of improving soil fertility, preparation of land for Irrigation, standards of quality for Irrigation water.

UNIT-VII:

WATER REQUIREMENT OF CROPS :

Soil-water-plant relationship, vertical distribution of soil moisture, soil moisture constants, soil moisture tension, consumptive use, estimation of consumptive use, Duty and delta, factors affecting duty, depth and frequency of Irrigation, irrigation efficiencies.

UNIT-VIII:

DESIGN OF CHANNELS :

Classification of canals, design of Irrigation canals by Kennedy's and Lacey's theories, balancing depth of cutting, canal lining.

Text Books:

1. Jayaram Reddy, "Engineering Hydrology", Laxmi Publications Pvt. Ltd., New Delhi, 2nd Edition, reprint 2008.

2. Punmia B.C., Pande B.B.L., Ashok K.R. Jain, Arun K.R. Jain, "Irrigation & Water Power Engineering" Laxmi Publications (P) Ltd., New Delhi, 16th Edition, 2009.
3. R.K.Sharma & T.K. Sharma, "Hydrology and Water Resource Engineering", Dhanpat Rai.

References:

1. V.P.Singh, "Elementary Hydrology" PHI publications.
2. P.N.Modi, "Irrigation, Water Resources & Water Power Engineering", Standard Book House, Rajsons Publications Pvt. Ltd., 2008.
3. D.K. Majumdar, "Irrigation Water Management" Prentice Hall of India, 3rd Printing, 2004.
4. Subramanya K, "Engineering Hydrology" Tata Mc Graw-Hill Publishing Company Ltd., New Delhi, 3rd Edition, 2008.

REINFORCED CONCRETE STRUCTURES- I

Course Code: ACE 1119

L	T	P	C
4	1	0	4

Aim :

The main objective of the course is to impart the basic concepts of design of reinforced concrete structures by limit state and working stress methods.

Scope :

The students shall be able to design of beams, columns, footings and slabs including detailing as per IS : 456-2000, SP -16 and other relevant codes.

UNIT –I:

INTRODUCTION TO LIMIT STATE DESIGN :

Concepts of limit state design- Characteristic loads-Characteristic strength- Partial loads and material safety factors- representative stress- strain curves- Assumptions in limit state design – Stress block parameters – Limiting moment of resistance.

UNIT –II:

SINGLY AND DOUBLY REINFORCED BEAMS :

Limit state analysis and design of singly reinforced , doubly reinforced, T and L beam sections.

UNIT –III:

SHEAR, TORSION AND BOND

Limit state analysis and design of sections for shear and torsion – concept of bond, anchorage and development length, I.S Code provisions. Design examples in simply supported and continuous beams.

UNIT – IV:

SLABS

Design of one way slabs – Two way slabs –Continuous slabs using IS coefficients.

UNIT – V:

COLUMNS

Short and long columns – under axial loads –uniaxial bending and bi-axial bending – I.S code provisions.

UNIT –VI:

FOOTINGS

Footings : Different types of footings – Design of isolated, square, rectangular and circular footings.

UNIT – VII:

LIMIT STATE DESIGN

Limit state design for serviceability for deflection, cracking and codal provisions.

UNIT –VIII:

INTRODUCTION TO WORKING STRESS METHOD:

Introduction – Design for bending – Design procedure – balanced sections – Analysis of a given section in bending – Depth of neutral axis with compression steel – Other design problems by working stress method.

NOTE : All the designs to be taught in Limit State Method

Following plates should be prepared by the students.

1. Reinforcement particulars of T-beams and L-beams.
2. Reinforcement detailing of continuous beams.
3. Reinforcement particulars of columns and footings.
4. Detailing of One way, Two way and continuous slabs

Text Books:

1. S.Unnikrishna Pillai & Devdas Menon, "Reinforced concrete design" Tata Mc.Graw Hill, New Delhi, 3rd Edition, 2009.
2. N.C. Sinha and S.K Roy, "Fundamentals of reinforced concrete" S. Chand publishers, 2002 4th Edition.
3. N. Krishna Raju and R.N. Pranesh, "Reinforced concrete design" New age International Publishers, New Delhi, 2004, 8th Edition.

4. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Limit State Design" Laxmi, publications Pvt. Ltd., New Delhi, 2003.
5. P.C.Varghese, "Limit state designed of reinforced concrete" Printice Hall of India, New Delhi.

References :

1. M.L. Gambhir, "Fundamentals of Reinforced concrete design" Prentice Hall of India Private Ltd., New Delhi, 2004.
2. P.Purushotham, "Reinforced concrete structural elements - Analysis and design" Tata Mc.Graw-Hill, 1994.
3. Arthus H.Nilson, David Darwin, and Chorles W. Dolar, "Design of concrete structures" Tata Mc.Graw-Hill, 3rd Edition, 2005.
4. J.N. Bando Padhyay "Design of Concrete Structures", PHI Publishers, 2010.

GEOTECHNICAL ENGINEERING-I

Course Code: ACE 1120

L	T	P	C
4	1	0	4

Aim :

To study the influence of soil properties on Civil Engineering structures.

Scope :

Understanding of various concepts of geotechnical engineering, including classification, Soil strength and the behaviour of the soil when loads are transferred to it from structures constructed in/ on it.

UNIT – I:

INTRODUCTION: Soil formation – soil structure and clay mineralogy – Adsorbed water – Mass- volume relationships – Relative density.

UNIT – II:

INDEX PROPERTIES OF SOILS: Grain size analysis – Sieve and Hydrometer methods – consistency limits and indices – I.S. Classification of soils

UNIT –III:

PERMEABILITY: Soil water – capillary rise – flow of water through soils – Darcy's law- permeability – Factors affecting permeability, capillary phenomenon in soils – laboratory determination of coefficient of permeability–Permeability of layered systems.

UNIT –IV:

SEEPAGE THROUGH SOILS: Total, neutral and effective stresses –quick sand condition – Seepage through soils – Flownets: Construction, Characteristics and Uses.

UNIT – V:

STRESS DISTRIBUTION IN SOILS: Boussinesq's and Westergaard's theories for point loads and for areas of different shapes – Newmark's influence chart .

UNIT – VI:

COMPACTION: Mechanism of compaction – factors affecting compaction– effects of compaction on soil properties – Field compaction equipment – field compaction control.

UNIT – VII:

CONSOLIDATION : Stress history of clay; compressibility of soils, Terzaghi's one dimensional consolidation theory, consolidation test, pre-consolidation pressure, e-p and e-log p curves, total settlement.

UNIT – VIII:

SHEAR STRENGTH OF SOILS : Mohr – Coulomb Failure theories – Types of laboratory strength tests – strength tests based on drainage conditions – Shear strength of sands – Critical Void Ratio – Liquefaction-shear strength of clays, pore pressure coefficients.

Text Books:

1. C. Venkataramiah, "Geotechnical Engineering", New Age International Pvt . Ltd, Revised 3rd Edition, 2008.
2. Gopal Ranjan & ASR Rao, "Basic and Applied Soil Mechanics", New Age International Pvt . Ltd, New Delhi, 2nd Edition, 2008.
2. K.R. Arora, "Soil Mechanics and Foundation Engg." Standard Publishers and Distributors, Delhi, 5th Edition, 2001.
4. V.N.S.Murthy, "Soil Mechanics and Foundation Engg." CBS Publishers and Distributors, 4th Edition, 2010.
5. Kalita, Ustav Chandra, "Soil Mechanics & Foundation Enginering", PHI learning, 1st Edition, 2011.

References:

1. T.W. Lambe and R.V. Whitman, "Soil Mechanics", Wiley India, 3rd Edition, 2008.
2. Purushotham Raj, " Geotechnical Engineering", Pearson Edition, 2nd Edition, 2009.
3. Manoj Dutta & Gulati S.K, "Geotechnical Engineering" Tata Mc Grawhill Publishers, New Delhi, 2nd Edition, 2006.

4. Roberto Nova, Lawra Gabrieli, “Soil Mechanics”, Wiley Publications, 1st Edition, 2010.
5. D.P.Coduto, “Geotechnical Engineering Principles and Practices”, Pearson, 3rd Edition, 2010.
6. NPTEL Video lectures.
7. IS 2720 all parts, and other relevant IS codes, special publications and handbooks

STRUCTURAL ANALYSIS – II

Course Code: ACE 1126

L	T	P	C
4	1	0	4

Aim :

To impart knowledge on various energy and matrix methods of structural analysis.

Scope :

The student (i) shall be able to analyse arches, beams, frames by slope deflection method, moment distribution method and Kani's method (ii) shall be able to analyse building frames by approximate methods. (iii) shall be able to apply matrix methods to continuous beams.

UNIT - I:

ARCHES : Three hinged, Elastic theory of arches – Eddy's theorem – Determination of horizontal thrust, bending moment, normal thrust and radial shear – effect of temperature.

UNIT - II:

TWO HINGED ARCHES: Determination of horizontal thrust, bending moment, normal thrust and radial shear – Rib shortening and temperature stresses, tied arches – basic concepts of fixed arches.

UNIT - III:

APPROXIMATE METHODS :

Approximate method of structural analysis, application to building frames. (i) Portal method (ii) Cantilever method.

UNIT - IV:

SLOPE DEFLECTION METHOD :

Derivation of slope deflection equation - application to continuous beams including settlement of supports, single bay- single storey portal frame including side sway.

UNIT - V:

MOMENT DISTRIBUTION METHOD :

Stiffness and carry over factors – Distribution factors – Analysis of continuous beams with and without sinking of supports – single storey portal frames – including sway - Substitute frame analysis by two cycle method.

UNIT - VI:

KANI'S METHOD:

Analysis of continuous beams – including settlement of supports - single bay portal frames with side sway.

UNIT - VII:

FLEXIBILITY METHOD:

Introduction, application to continuous beams including support settlements.

UNIT - VIII:

STIFFNESS METHOD:

Introduction, application to continuous beams including support settlements.

Text Books:

1. Bhavikatti S.S, "Analysis of Structures, Vol. I & II", Vikas Publications, 6th Edition, 2009.
2. Vazirani & Ratwani, "Analysis of structures", Khanna Publications, 19th Edition, 2008.
3. B.C. Punmia, "Strength of Materials and mechanics of solids Vol-2", Laxmi Publications, New Delhi, 10th Edition, 2009.
4. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, "Theory of Structures", Laxmi Publications, 12th Edition, 2004.

References :

1. Pandit and Gupta, "Structural Analysis (Matrix Approach)", Tata Mc Graw Hill, New Delhi, 2008.
2. S.Ramamurtham, R. Narayan, "Thoery of Structures", Dhanapati Rai Publishing company, 9th Edition, 2010.
3. C.S.Reddy, "Structural Analysis", Tata Mc Graw Hill, New Delhi, 2008.

TRANSPORTATION ENGINEERING - I

Course Code: ACE 1122

L	T	P	C
4	0	0	4

Aim :

To introduce basic concept of Geometric Design of Highways and Traffic Engineering.

Scope :

Overview of the highway development and Planning, importance of highway materials, concept of the highway geometric design and basics of traffic engineering using relevant codes.

UNIT -I:

HIGHWAY DEVELOPMENT AND PLANNING:

Highway development in India – Necessity for Highway Planning- Different Road Development Plans- Classification of Roads- Road Network Patterns – Highway Alignment- Factors affecting Alignment- Engineering Surveys – Drawings and Reports.

UNIT –II:

HIGHWAY MATERIALS:

Highway materials- soil, aggregate and bitumen –test on aggregate – aggregate properties and their importance. Tests on Bitumen – Bituminous concrete – Requirements of design mix – Marshall method of Bituminous mix design.

UNIT – III:

HIGHWAY GEOMETRIC DESIGN-I :

Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distance Elements- Stopping sight Distance, Overtaking Sight Distance and intermediate Sight Distance.

UNIT – IV:

HIGHWAY GEOMETRIC DESIGN-II :

Design of Horizontal Alignment- Design of Super elevation and Extra widening- Design of Transition Curves-Design of Vertical alignment-Gradients- Vertical curves.

UNIT – V:

TRAFFIC ENGINEERING:

Basic Parameters of Traffic-Volume, Speed and Density- Traffic Volume Studies-speed studies- Data Collection and Presentation- Parking Studies and Parking characteristics- Road Accidents-Causes and Preventive measures- Accident Data Recording – Condition Diagram and Collision Diagrams.

UNIT – VI:

TRAFFIC REGULATION AND MANAGEMENT:

Road Traffic Signs – Types and Specifications – Road markings-Need for Road Markings-Types of Road Markings- Design of Traffic Signals –Webster Method –IRC Method.

UNIT – VII:

AT GRADE INTERSECTION DESIGN :

Types of Intersections – Conflicts at Intersections- Types of At-Grade Intersections- Channelisation: Objectives –Traffic Islands and Design criteria – Rotary - Types.

UNIT – VIII:

GRADE SEPARATED INTER SECTION DESIGN :

Types of Grade Separated Intersections- Rotary Intersection – Flyovers, ROB, Cloverleaf (partial, full). Criteria for selection, Advantage, disadvantages of grade separated intersection.

Text Books:

1. S.K.Khanna & C.E.G.Justo "Highway Engineering", Nemchand & Bros., 7th Edition, 2000.
2. L.R.Kadiyali and Lal "Principles & Practices of Highway Engineering" Khanna Publications, 4th Edition, 2004.

3. V.N.Vazirani and S.P.Chandra, "Transportation Engineering- Vol. I", Khanna Publications, 4th Edition, 1994.

References:

1. S.P.Bindra, "Highway Engineering" Dhanpat Rai & Sons. – 4th Edition (1981)
2. Dr.L.R.Kadyali, "Traffic Engineering & Transportation Planning", Khanna publications – 6th Edition – 1997.
3. NPTEL Videos
4. Indian Road Congress, Ministry of Road Transport and Highways, and Special Publications

ESTIMATION & QUANTITY SURVEYING

Course Code: ACE 1123

L	T	P	C
4	0	0	4

Aim :

To provide the basic knowledge on estimation of buildings, roads and drainage works.

Scope :

At the end of the course, the student shall be able to do the detailed estimate of buildings and roads.

UNIT – I:

INTRODUCTION :

General items of work in Building – Standard Units –Principles of working out quantities for detailed and abstract estimates – Approximate method of Estimating.

UNIT – II:

Detailed Estimates of Buildings.

UNIT – III:

Standard specifications for different items of building construction.

UNIT – IV:

Rate Analysis – Working out data for various items of work, over head and contingent charges.

UNIT-V:

Reinforcement bar bending and bar requirement schedules.

UNIT – VI:

Contracts – Types of contracts – Contract Documents – Conditions of contract

UNIT – VII:

Valuation of buildings – Purpose and Principles of valuation – Technical terms – Methods of valuation.

UNIT – VIII:

Estimation of quantities for road work items.

Text Books:

1. B.N. Dutta, "Estimating and Costing", UBS publishers, 2000, 10th Edition.
2. G.S. Birdie "Estimating and Costing" Dhanapati Rai Publishing company, 6th Edition, 2005
3. A.K. Upadhyay, "Civil Estimating and Costing", S.K. Kataria and Sons Publishers, 2010, 8th Edition.

References:

1. Standard Schedule of rates and standard data book by public works department, 2010.
2. I. S. 1200 (Parts I to XXV – 1974/ method of measurement of building and Civil Engineering works – B.I.S.)
3. M. Chakraborthi; "Estimation, Costing and Specifications", Laxmi publications, 2008, 7th Edition.
4. National Building code - 2010.

TRANSPORTATION ENGINEERING LAB

Course Code: ACE 1124

L	T	P	C
0	0	3	2

Aim :

To develop basic skills in testing of Highway Materials.

Scope :

All road aggregate and bitumen testing.

ROAD AGGREGATES:

1. Aggregate Crushing value
2. Aggregate Impact Test.
3. Specific Gravity and Water Absorption.
4. Attrition Test
5. Abrasion Test.
6. Shape tests

BITUMINOUS MATERIALS :

1. Viscosity Test.
2. Ductility Test.
3. Softening Point Test.
4. Flash and fire point tests.
5. Marshall mix design
6. Benkelman beam (Optional)

GEOTECHNICAL ENGINEERING LAB

Course Code: ACE 1125

L	T	P	C
0	0	3	2

Aim :

To enable a student to understand the various index and engineering properties of a soil by experimentation.

Scope :

Determination of index and engineering properties of a soil sample.

LIST OF EXPERIMENTS

1. Atterberg's Limits.
2. Field density-core cutter and sand replacement methods
3. Grain size analysis
4. Permeability of soil, constant and variable head tests
5. Compaction test
6. CBR Test
7. Consolidation test
8. Unconfined compression test
9. Direct shear test.
10. Vane shear test

SYLLABI FOR VI SEMESTER

WATER RESOURCES ENGINEERING-II

Course Code: ACE 1121

L	T	P	C
4	1	0	4

Aim :

To provide the necessary background for understanding the concepts of Irrigation structures.

Scope :

To provide the necessary background for understanding behavior of various Irrigation Structures (minor and major) and their design principles and construction features.

UNIT-I:

DIVERSION HEAD WORKS: Types of Diversion head works-diversion and storage head works, weirs and barrages, layout of diversion head works, components. Causes and failure of hydraulic structures on permeable foundations, Bligh's creep theory, Khosla's theory, determination of uplift pressure, impervious floors using Bligh's and Khosla's theory, exit gradient, functions of u/s and d/s sheet piles.

UNIT-II:

CANAL STRUCTURES I: Types of falls and their location, design principles of Sarda type fall, trapezoidal notch fall and straight glacis fall.

UNIT-III:

CANAL STRUCTURES II: canal regulation works, principles of design of distributory and head regulators, canal outlets, types of canal modules, proportionality, sensitivity and flexibility.

UNIT-IV:

CROSS DRAINAGE WORKS: types, selection of site, design principles of aqueduct, siphon aqueduct and super passage.

UNIT-V:

DAMS AND RESERVOIRS : Types of dams, merits and demerits, selection of type of dam, selection of site for dam, types of reservoirs, selection of site for reservoir, zones of storage of a reservoir, reservoir

yield, estimation of capacity of reservoir using mass curve.

UNIT-VI:

GRAVITY DAMS: Forces acting on a gravity dam, causes of failure of a gravity dam, elementary profile and practical profile of a gravity dam, limiting height of a low gravity dam, stability analysis, drainage galleries.

UNIT-VII:

EARTH DAMS: Types of Earth dams, causes of failure of earth dam, criteria for safe design of earth dam, seepage through earth dam-graphical method, measures for control of seepage.

UNIT-VIII:

SPILLWAYS: types of spillways, design principles of Ogee spillways, types of spillway gates.

Text Books:

1. S.K Garg, "Irrigation engineering and hydraulic structures", Khanna publishers, 2001.
2. K.R.Arora, "Irrigation, Water Power and Water Resources Engineering", Standard Publishers Distributors, 3rd Edition, 2010.
3. R.K. Sharma and T.K. Sharma, "Irrigation Engineering", S. Chand Publishers, 2007.
4. B.C.Punmia, B.B.L. Pande, Ashok K.R. Jain, Arun K.R. Jain, "Irrigation & Water Power Engineering" Laxmi Publications (P) Ltd., New Delhi, 16th Edition, 2009.

References:

1. G.L. Asawa, "Irrigation and Water Resources Engineering", New Age International Publishers, 2005.
2. Varshney R.S., "Concrete dams", Oxford and IBH Pub. Co.New Delhi, 1978.
3. Varshney R.S., S. C. Gupta & R.L. Gupta "Theory and Design of Hydraulic structures", Nemchand and Brothers, 1992.
4. Satyanarayana Murthy C, "Water Resources Engineering", New Age International Pvt. Ltd. Publishers, 1st Edition, 1997.
5. Relevant IS codes.

DESIGN OF STEEL STRUCTURES

Course Code: ACE 1127

L	T	P	C
4	1	0	4

Aim :

To acquire basic knowledge in designing various steel structural elements.

Scope :

The student shall be able to design steel-compression members, tension members, beams and beam columns, connections, trusses as per IS 800-2007.

UNIT– I:

WELDED CONNECTIONS:

Introduction, Advantages and disadvantages of welding- Strength of welds-Butt and Fillet welds: Permissible stresses – IS Code requirements. Design of welds, fillet weld subjected to moment acting in the plane and at right angles to the plane of the joints.

UNIT – II:

BEAMS:

Allowable stresses, Design requirements as per IS Code-Design of simple and compound beams-Curtailment of flange plates, check for deflection, shear, buckling, check for bearing, laterally unsupported beams.

UNIT –III:

TENSION MEMBERS:

General design of members subjected to direct tension.

COMPRESSION MEMBERS:

Effective length of columns, Slenderness ratio – permissible stresses, Design of compression members, Struts etc.

UNIT – IV:

BUILT UP COLUMNS : Design of Built up compression members – Design of lacings and battens. Design Principles of Eccentrically loaded columns and splicing of columns.

UNIT – V:

DESIGN OF COLUMN BASES:

Design of slab base and gusseted bases. Column bases subjected to moment.

UNIT – VI:

ROOF TRUSSES:

Different types of trusses – Design loads – Load combinations, IS Code recommendations, structural details – Design of simple roof trusses involving the design of purlins.

UNIT – VII:

PLATE GIRDER:

Design consideration – I S Code recommendations, Design of welded plate girder – Vertical stiffeners design.

UNIT – VIII:

Design of Gantry Girders.

Note: The students should prepare the following plates.

Plate 1 Detailing of simple beams

Plate 2 Detailing of compound beams including curtailment of flange plates.

Plate 3 Detailing of Column including lacing and battens.

Plate 4 Detailing of Column bases – slab base and gusseted base

Plate 5 Detailing of steel roof trusses including particulars at joints.

Plate 6 Detailing of Plate girder including curtailment, splicing and stiffeners.

Text Books:

1. Bhavikatti, “Design of Steel Structures”, University Press. Hyderabad, 6th Edition, 2010.
2. S.K. Duggal, “Design of steel structures”, Tata Mcgraw Hill, New Delhi, 4th Edition, 2009.

References:

1. B.C. Punmia, “Comprehensive Design of Steel structures”, Ashok Kumar Jain and Arun Kumar Jain, Laxmi Publications, New Delhi, 10th Edition, 2007.
2. P. Dayaratnam, “Design of Steel Structures” S. Chand Publishers, 2nd Edition, 2009.
3. Prof. Dr. V.L. Shah, Prof. Veena Gore, “Limit State Design of Steel Structures”, Structures Publications, 1st Edition, 2009.

IS Codes:

1. IS -800 – 2007"Codes of Practice for General Construction in Steel”, BIS, 2007
2. IS – 875 – Part III, “Codes of Practice for Design Loads (other than Earthquake, for Buildings and Structures), 1987.
3. Steel Tables.

These codes and steel tables are permitted in the examinations.

ENVIRONMENTAL ENGINEERING-I

Course Code: ACE 1128

L	T	P	C
4	1	0	4

Aim :

To stress upon the aspects of environmental engineering, i) supply of safe drinking water, ii) Safe disposal of sewage, to gain the knowledge of collection of data design and execution of water and waste water treatment plants.

Scope:

Necessary theory and knowledge, data requirement and collection of the same. Mathematical formulations for the design of water and waste water treatment units. Full acquaintance with the conventional and miscellaneous treatment units and to learn the knowledge for the execution of the projects.

UNIT – I:

INTRODUCTION :

Aspects of Environmental Engineering – Protected water supply – Need – Water demands – factors affecting fluctuations – design period – population forecast – water quality and testing – drinking water standards.

UNIT-II:

SOURCES OF WATER :

Quality , Quantity and other considerations – yield calculations – intakes – systems of water supply – requirements – storage reservoir capacity – pumping – selection of a pump – detection of leakages – economical diameter of pumping main.

UNIT III:

TREATMENT OF WATER :

Water treatment, conventional treatment flow diagram – Sedimentation

– types – principles – design factors – coagulation – design of clarifloculator – filtration – slow and rapid gravity filters – multimedia and pressure filters – design principles.

UNIT –IV:

METHODS OF DISINFECTION & DISTRIBUTION :

Disinfection – chlorination – miscellaneous treatment methods – distribution systems – layouts – design- and analysis, Hardy Cross and equivalent pipe method - pipe joints – valves – other appurtenances.

UNIT-V:

WASTE WATER MANAGEMENT :

Introduction : waste water treatment system – definitions of terms – waste water management systems – collection and conveyance of sewage – sewage flow rates – stormwater – characteristics of sewage – cycles of decay – BOD- COD – ultimate disposal of sewage.

UNIT VI:

DESIGN OF SEWERS:

Layouts – design of sewers – sewers appurtenances – sewage pumping – conventional sewage treatment – primary treatment screens – grit chamber – sedimentation tanks – design principles.

UNIT – VII:

SECONDARY BIOLOGICAL TREATMENT :

Secondary treatment – Biological treatment – trickling filters – Activated Sludge Process – low cost waste treatment methods – Design of oxidation ponds – Aerobic and anaerobic lagoons.

UNIT-VIII:

DESIGN OF SLUDGE DIGESTION :

Sludge Digestion – Design principles – disposal – septic tanks & Imhoff tanks – Rural latrines – House plumbing – appurtenances.

Text Books:

1. G.S. Birdi, "Water supply and sanitary Engineering", Dhanpat Rai & Sons Publishers. 8th Edition, 2010.

2. B.C.Punmia, "Water Supply Engineering, Vol. 1, Waste water Engineering Vol. II", Ashok Jain & Arun Jain, Laxmi Publications Pvt.Ltd, New Delhi, 2nd edition, 2008.

3. K.N. Duggal, "Elements of Environmental Engineering", S. Chand Publishers, 7th edition, 2010.

Referencess:

1. Hammer and Hammer "Water and wastewater Technology", Prentice hall of India, 4th edition 2003.

2. Fair, Geyer and Okun, "Water and Waste Water Engineering", Wiley, 3rd edition, 2010.

3. Metcalf and Eddy, "Waste water Engineering",Tata Mc Graw Hill,3rd edition,2008.

4. Howard S. Peavy, Donand P. Rowe, George Technobanoglous, "Environmental Engineering", Mc Graw – Hill Publications, Civil Engineering Series, 1st edition 1985.

REMOTE SENSING & GIS

Course Code: ACE 1129

L	T	P	C
4	0	0	4

Aim :

To introduce the concepts of Remote Sensing & GIS along with simple applications in Civil Engineering.

Scope :

Overview of the latest developments in Remote Sensing Satellites, GIS and its applications in different fields of Civil Engineering.

UNIT – I:

PHOTOGRAMMETRY :

Introduction – Principle and types of Aerial Photographs, Stereoscopy, Map Vs Mosaic, Ground Control, Parallax Measurements for height.

UNIT – II:

REMOTE SENSING – I:

Basic concepts and foundation of Remote Sensing – Elements involved in Remote Sensing , Electromagnetic Spectrum, Physics of Remote Sensing Energy Resources, Energy Interactions with Earth Surface Features and Atmosphere.

UNIT – III:

REMOTE SENSING – II:

Resolution, Sensors and Satellite, Visual Interpretation Techniques - Basic Elements, Converging Evidence, Interpretation for terrain evaluation, Spectral Properties of water bodies, Introduction to Digital data Analysis.

UNIT – IV:

GEOGRAPHIC INFORMATION SYSTEM – I

Geographic Information System: Introduction, GIS categories, components

of GIS, fundamental operations of GIS, A theoretical framework for GIS. Types of data representation- Data collection and input overview, data input and output. Manual digitizing and scanning.

UNIT – V:

GEOGRAPHIC INFORMATION SYSTEM –II

Raster GIS, Vector GIS; File management ; Spatial data – Layer based GIS, Feature based GIS mapping. GIS Spatial Analysis: Data storage-vector data storage, attribute data storage, overview of the data manipulation and analysis. Integrated analysis of the spatial and attribute data. Integration of RS & GIS, GIS as decision making tool, exposure to various softwares – Arc GIS, ERDAS, ILWIS.

UNIT – VI:

WATER RESOURCES APPLICATIONS- I:

Land use/Land cover in water resources, Surface water mapping and inventory, Rainfall – Runoff relations and runoff potential indices of watersheds, Flood and Drought impact assessment and monitoring.

UNIT – VII:

WATER RESOURCES APPLICATIONS- II:

Watershed management for sustainable development and Watershed characteristics – Reservoir sedimentation, Ground water targeting & identification of sites for artificial recharge structures, Drainage morphometry, water depth estimation and bathymetry.

UNIT – VIII:

ENVIRONMENTAL AND TRANSPORTATION ENGINEERING APPLICATIONS :

Air pollution – Detection & Identification of pollution sources of Surface & Ground Water – Water quality Mapping & Monitoring, Environmental Impact Assessment – Highway alignment-urban Planning and Infrastructure Development.

Text Books:

1. Lillesand and Kiefer, "Remote Sensing and Image Interpretation", published by John Wiley and Sons, 5th Edition, 2008.

2. Peter A Burrough and Rachael A, MC Donnell, "Principles of Geographical Information Systems", Oxford Publishers, First Edition, 1998.
3. M.Anji Reddy, "Remote Sensing and Geographical Information systems", B.S.Publications, 3rd Edition, 2006.
4. LRA Narayana, "Basics of Remote Sensing and its applications" Universities press, First Edition, 2001
5. Paul R Wolf, " Elements of Photogrammetry with Application in GIS", Published by Mc Graw Hill, 3rd Edition, 2008.

References:

1. Micheal N Demers, "Fundamental of GIS" John Wiley & Sons, 3rd Edition, 2008.
2. C.P.Lo Albert, K.W. Yonng, "Concepts & Techniques of GIS", Prentice Hall (India) Publications, 2nd Edition, 2008.
3. Wolf Paul Richard and Dewitt, "Elements of Photogrammetry", Published by Mc Graw Hill, 2nd Edition, 1983.
4. David P Paine, "Aerial Photography and image interpretation", published by Wiley, Higher Education, 2nd Edition, 2006.
5. Kang – Tsung chang, "Introduction to GIS", TMH Publications & Co., 4th Edition, 2007.
6. K.M. Chandra, S.K. Ghosh, "Remote Sensing and Geographical Information System", Narosa Publishing house, 1st Edition, 2007.
7. Ian Heywood, Sarah Cornelius, Steve Carver, "An Introduction to Geographical Information Systems" Pearson Education Asia, 1st Edition, 2000.
8. Bernhardsen, "Geographic Information Systems, An Introduction", Published by John Wiley Sons, 3rd Edition, 2006.

TRANSPORTATION ENGINEERING – II

Course Code: ACE 1130

L	T	P	C
4	0	0	4

Aim :

To introduce basic concept of Pavement Design and Construction, Principles of Railway Engineering, Airport Engineering , Docks and Harbors.

Scope :

A detailed study about various modes of transport namely, roads, railways, airport, dock and harbour.

UNIT-I:

PAVEMENT DESIGN –I :

Pavement Design – CBR method of flexible pavement design – IRC method of flexible pavement design, AASHO method of flexible pavement design.

UNIT-II:

PAVEMENT DESIGN –II :

IRC method of rigid pavement design – importance of joints in rigid pavements – types of joints – use of tie bars and dowell bars.

UNIT-III:

HIGHWAY CONSTRUCTION, MAINTENANCE AND DRAINAGE:

Highway construction – construction of earth roads – gravel roads – WBM roads – Bituminous roads – cement concrete roads – reinforced concrete pavements – construction of joints in cement concrete pavements.

Highway Maintenance – Failures of flexible and rigid pavements and their maintenance- strengthening of existing pavements.

Highway drainage – importance of highway drainage – surface, sub surface drainage.

UNIT - IV:

HIGHWAY ECONOMICS & FINANCE :

Highway user benefits – Highway cost – Economic analysis – Highway finance.

UNIT – V:

RAILWAY ENGINEERING- I:

Permanent way components – Cross Section of Permanent Way – Functions of various Components like Rails, Sleepers and Ballast –Rail Fastenings – Creep of Rails- Theories related to creep – Adzing of Sleepers- Sleeper density.

UNIT – VI:

RAILWAY ENGINEERING- II:

Rail joints, welding of rails and creep of rails. Turnouts – left hand turnout – track – junctions – points and crossings – tracks drainage – railway stations and yards – signaling.

UNIT – VII:

AIRPORT ENGINEERING:

Factors affecting Selection of site for Airport and Layout Design – Computation of Runway length – Correction for Runway Length – Orientation of Runway – Wind Rose Diagram – Runway Lighting system – Taxiways, Apron, Control tower terminal building.

UNIT – VIII:

DOCKS & HARBOURS:

Types – layout and planning principles – Break waters – Docks – Wharves and Quays – Transit sheds – Ware houses – Navigational Aids.

Text Books:

1. S.K.Khanna & C.E.G.Justo, "Highway Engineering", Nemchand & Bros., 7th edition (2000).
2. S.P.chadula, "Railway Engineering – A text book of Transportation Engineering" , S.Chand & Co. Ltd. (2001).

3. L.R.Kadiyali and Lal “Principles & Practices of Highway Engineering” Khanna Publications, 4th Edition, 2004.
4. S.K.Khanna and M.G.Arora, “Airport Planning and Design” Nemchand & Bros., 6th edition (1999).
5. Rangwala S.C & K.S. “ Railway Engineering”, Charotar Publications, 14th Edition, 2005.
6. Saxena S.C and Arora S.P “Railway Engineering”, Dhanapat Rai Publications, 6th Edition, 2004.
7. Seetharaman “Dock & Harbour Engineering”, Umesh Publications, 1st Edition, 2008.

References:

1. S.P.Bindra , “Highway Engineering”, Dhanpat Rai & Sons.
2. Dr.L.R.Kadyali, “Traffic Engineering & Transportation Planning”, Khanna publications, 6th Edition, 1997.
3. Virendhra Kumar & Statish Chandhra, “Air Transportation Planning & design”, Gal Gotia Publishers, 1999.
4. Robert M. Horonjeff “ Planning and Design of Airports”, Mc Graw Hill Publications, 2008.
5. J. S. Mundrey, “Railway Track Engineering”, Mc Graw Hill Publications, 4th Edition, 2010.
6. Indian Road Congress, Ministry of Road Transport and Highways, and Special Publications

GEOTECHNICAL ENGINEERING – II

Course Code: ACE 1131

L	T	P	C
4	1	0	4

Aim :

To study the various foundations systems in vogue.

Scope :

Analysis and design of foundations for various Civil Engineering structures.

UNIT – I:

SOIL EXPLORATION:

Need – Methods of soil exploration – Boring and Sampling methods – Field tests – Penetration Tests – Plate load test – Pressuremeter test – planning of exploration programme and preparation of soil investigation report.

UNIT – II:

EARTH SLOPE STABILITY:

Infinite and finite earth slopes – types of failures – factor of safety of slopes – stability analysis by method of slices, Bishop's Simplified method – Taylor's Stability Number- Stability of slopes of earth dams under different conditions.

UNIT – III:

EARTH PRESSURE THEORIES:

Rankine's theory of earth pressure – earth pressures in layered soils – Coulomb's earth pressure theory – Culmann's graphical method

UNIT-IV:

RETAINING WALLS:

Types of retaining walls – stability of retaining walls.

UNIT – V:

SHALLOW FOUNDATIONS-I:

Types – choice of foundation –Depth of foundation – Safe Bearing Capacity – Terzaghi, Meyerhof, Skempton and IS Methods

UNIT-VI:

SHALLOW FOUNDATIONS-II:

Safe bearing pressure based on N- value –plate load test – Settlement Analysis – immediate and consolidation settlement.

UNIT –VII:

DEEP FOUNDATIONS- I:

Types of piles – Load carrying capacity of piles based on static pile formulae – Dynamic pile formulae – Pile load tests – Load carrying capacity of pile groups in sands and clays – Settlement of pile groups.

UNIT-VIII:

DEEP FOUNDATIONS-II:

Types and shapes of wells – Components of wells – functions and design criteria – Sinking of wells – Tilts and shifts.

Text Books:

1. B.M. Das, "Principles of Foundation Engineering", Thomson press, 6th Edition, 2006.
2. Swami Saran, "Analysis and Design of Substructures", Oxford and IBH Publishing company Pvt Ltd., 2nd Edition - 2007 (Reprint).
3. N.P. Kurian, "Design of foundation system – Principles and practices", Narosa Publishing house, 3rd Edition, 2005.
4. V.N.S.Murthy, "Soil Mechanics and Foundation Engg." CBS Publishers and Distributors, 4th Edition, 2010.

References:

1. Varghese,P.C., "Foundation Engineering" Prentice Hall of India, 1st Edition, 2005.

2. J.E. Bowles, “Foundation Analysis and Design”, McGraw-Hill Publishing company, 5th Edition, 1995.
3. M.J. Tomlinson, “Foundation Engineering”, Pearson Publishers, 7th Edition, 2001.
4. S. K.Gulhati & Manoj Datta, “Geotechnical Engineering”, Tata Mc.Graw Hill Publishing company New Delhi, 1st Edition 2005.
5. D.P. Coduto, “Foundation Designs – Principles and Practices”, Prentice Hall of India, 1st Edition, 2009.
6. Relevant IS codes, special publications and handbooks
NPTEL Video lectures.

GEOMATICS LAB

Course Code: ACE 1132

L	T	P	C
0	0	3	2

Aim :

To work with Arc GIS / ERDAS / ILWIS software.

Scope :

The student shall be able to prepare various thematic maps and its applications in various fields like water resources and transportation Engineering.

1. Opening and Importing of an Image.
2. Rectification of Images.
3. Subsetting & Mosaicing.
4. Classification – Supervised & Unsupervised.
5. Digitization of Map/Toposheet, Creation of thematic maps.
6. Developing Digital Elevation model, Draping of an image.
7. Simple applications of GIS in Water Resources Engineering & Transportation Engineering.

GIS SOFTWARE :

Arc GIS 9.2

ERDAS 9.1

Mapinfo 6.5

ILWIS

TOTAL STATION :

1. Determination of area
2. Traversing
3. Contouring
4. Determination of Remote height

5. Stake out
6. Distance, Gradient, Difference in height between two inaccessible points
7. GPS

LIST OF EQUIPMENT :

Leveling Staff

Total Station

G.P.S.

ADVANCED COMMUNICATION SKILLS LAB

CODE: AHE1103

L	T	P	C
0	0	3	2

Introduction

The introduction of English Language Lab is considered essential at III/ IV B.Tech year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context. This is an integrated theory and lab course to enable students use 'good' English and perform the following:

- Gathering ideas and information: organizing ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research/technical reports
- Making oral presentations.
- Writing formal letters and essays.
- Transferring information from non-verbal to verbal texts and vice versa.
- Taking part in social and professional communication.

Objectives:

The Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' accuracy and fluency in English through a well-developed vocabulary, and enable them listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

- To enable them communicate their ideas relevantly and coherently in writing.

TEXT BOOK: LANGUAGE IN USE (Upper-Intermediate) ***by Adrian Doff and Christopher Jones, Cambridge University Publications.***

UNIT – I:

- Reading and Listening comprehension – reading for facts, guessing meanings from context, scanning, skimming, inference, critical reading
- (Lesson 2: Communicating)

UNIT – II:

- Vocabulary building, Creativity & Innovation, Using Advertisements and Music, Case studies
- Decision-Making, Time Management, Positive Thinking
- (Lesson 4: Sports and Games, Lesson 8: In The Market-Place)

UNIT – III:

- Cross-Cultural Communication- Problems of Language, Lack of Language equivalency/difficulties in using English.
- Non-Verbal Communication across different Cultures.
- (Lesson 13: Right and Wrong)

UNIT – IV:

- Literary reviews- reviewing the choicest genres like science fiction, autobiographies, travelogues, modern poetry etc.

UNIT – V:

- Group Discussion – dynamics of group discussion , Lateral thinking, Brainstorming and Negotiation skills

(Lesson 10: Life, the universe and everything & Lesson 16: World Affairs)

UNIT – VI:

- Resume writing – structure and presentation, planning, defining the career objective

- Interview Skills – concept and process, pre-interview planning, opening strategies, answering-strategies, interview through tele and video-conferencing

UNIT – VII:

- Writing essays for competitive examinations
- Media writing-writing headlines, analyzing newspaper articles
- Analytical writing

UNIT – VIII:

- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.- Progress and Project Reports.

Recommended Books:

Communications Skills

1. M. Ashraf Rizvi, "Effective Technical Communication", Tata McGraw-Hill Publishing Company Ltd., 2005.
2. Bhanu Ranjan, "An Approach to Communication Skills", DhanpatRai &Co, 2010.
3. Raymond V. Lesikar, Marie E. Flatley, "Basic Business Communication: Skills for Empowering The Internet Generation", 11th Edition, Tata McGraw-Hill. 2006.
4. Stephen Bailey, "Academic Writing- A Practical guide for students", Routledge Falmer, London & New York, 2004.
5. Dr A. Ramakrishna Rao, Dr G.Natanam & Prof S.A. Sankaranarayanan, "English Language Communication : A Reader cum Lab Manual", Anuradha Publications, Chennai, 2006.
6. Dr. Shalini Verma, "Body Language- Your Success Mantra", S. Chand, 2006.
7. Barron's, "DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice", New Age International (P) Ltd., Publishers, New Delh, Books on TOEFL/GRE/GMAT/CAT, 2011.
8. "IELTS series with CDs", CUP, 2010.

9. Daniel G. Riordan & Steven E. Pauley, "Technical Report Writing Today", Biztantra Publishers, 2005.
10. Andrea J. Rutherford, "Basic Communication Skills for Technology", 2nd Edition, Pearson Education, 2007.
11. Sunita Mishra & C. Muralikrishna, "Communication Skills for Engineers", Pearson Education, 2007.
12. Jolene Gear & Robert Gear, "Cambridge Preparation for the TOEFL" Test, 2010.
13. Meenakshi Raman & Sangeeta Sharma, "Technical Communication", OUP, 2010.
14. Nick Ceremilla & Elizabeth Lee, "Cambridge English for the Media", CUP, 2010

General Reading

1. A Reader's Digest Selection, "Classic Short Stories" (India Today group), 2004.
2. Saros Cowasjee, "More Stories from the Raj and After", HarperCollins Publishers India, 1986.
3. Girish Karnad, "Hayavadana", OUP 1976.
4. A.P.J. Abdul Kalam "Wings of Fire", Universities Press, 1999.
5. Bernard Shaw, "Apple Cart/Arms and the Man", Orient Longman, 2010.
6. Khalil Gibran, "The Prophet" - Rajapal & Sons, 2008.

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GVP College of Engg.

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(Autonomous)
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