Bapatla Engineering College

(*Autonomous*)

BAPATLA

ACADEMIC RULES & REGULATIONS and SYLLABUS
(R18 REGULATIONS)

HAND BOOK

(2019-2020)

First & Second Year B.Tech.

Bapatla Engineering College:: Bapatla

(Autonomous under Acharya Nagarjuna University)
(Sponsored by Bapatla Education Society)
BAPATLA-522102, Guntur District, A.P.
www.becbapatla.ac.in

Vision & Mission of the College

Vision:

To build centers of excellence, impart high quality education and instill high standards of ethics and professionalism through strategic efforts of our dedicated staff, which allows the college to effectively adapt to the ever changing aspects of education.

To empower the faculty and students with the knowledge, skills and innovative thinking to facilitate discovery in numerous existing and yet to be discovered fields of engineering, technology and interdisciplinary endeavors.

Mission:

Our mission is to impart the quality education at par with global standards to the students from all over India and in particular those from the local and rural areas. We continuously try to maintain high standards so as to make them technologically competent and ethically strong individuals who shall be able to improve the quality of life and economy of our country.

Profile of the College

Year of Start	1981
Courses offered	**B.Tech.:** 1. Civil Engineering (CE), 2. Computer Science & Engineering (CSE), 3. Electronics & Communication Engineering (ECE), 4. Electrical & Electronics Engineering (EEE), 5. Electronics & Instrumentation Engineering (EIE), 6. Information Technology (IT), 7. Mechanical Engineering (ME)
	M.Tech.: 1. CE (Structural Engineering), 2. ME (CAD/CAM), 3. ECE (Communication Engineering & Signal Processing), 4. EEE (Power Systems Engineering) & 5. C.S.E.
	Master of Computer Applications (MCA)
	M.Sc.: Mathematics, Physics, Electronics, Chemistry (Organic & Analytical) & Computer Science
Accredited by NBA in the years	07.05.2003 (CE, CSE, ECE, EEE, EIE, ME) 16.03.2007 (CH, CE, CSE, ECE, EEE, EIE, IT & ME) 04.01.2013 (CH, CE, CSE, ECE, EEE, EIE & ME)
Autonomous Status	2010
Accredited by NAAC	2015
Research Park	Innovation Centres: 1) Kuka Robotic Technology Centre 2) Bosch Rexroth Centre of Competence in Automation Technologies 3) Siemens Centre of Excellence 4)Industry Institute Interaction Cell 5) Centre for Continuing Education 6) Incubation Skill Development Cell
Library	Titles: 28,323; Books: 75,317, Journals: International Online-523, Print-30, National Print-90, Educational CDs- 3,237; No. of Staff: 8
Sports facilities	Cricket, Basket Ball, Volley Ball, Ball Badminton, Hockey, Tennis, Foot Ball, Table Tennis, Chess, Caroms & Weight Lifting, Weight Training
Area	30 Acres; Built-up Area: 56102 Sq.mt.
Awards	Best Library (2011, 14, 18), Best laboratory (2009, 10, 11), Best UG Performance College (2011, 12) ,Best Eco Friendly Campus (2016) from Acharya Nagarjuna University
CISCO	A two-way interactive CISCO Digital Media System that is first of its kind in the South Asia Pacific Region at a cost of Rs.3 Crores
Placement/Training	No. of Students placed in 2018-19: 450, No. of Companies visited: 50
Students Activities	Suryodhaya Society for Awakening Community **(SAC)** for social service, Centre for Creative Arts **(CCA)** for cultural & arts and **AWAAZ** the literary club with the main motto of nurturing the inherent talents in the students.
NCC / NSS	NCC (Army wing) unit with 50 cadets. Training will be given by the P.I. Staff from 1(A) Engr. Coy, Guntur. NSS with 300 volunteers.
Facilities	Hostel for girls, Food court, Own Transport, 24x7 power supply, Mineral water, Bank, Post Office

ABOUT THE BAPATLA EDUCATION SOCIETY

BAPATLA EDUCATION SOCIETY was established in the year 1962 registered No: 58/1962 under societies act XXI of 1860 with the objectives to found and run the Educational & Cultural Institutions.

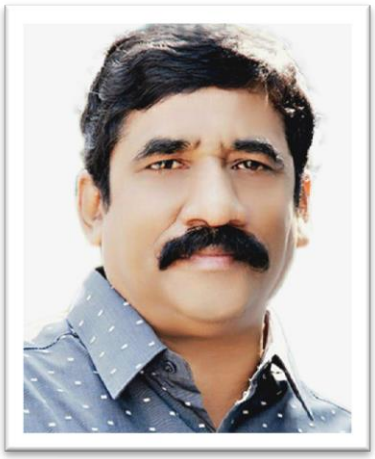
Distinguished Office Bearers of the Society:

Sri M. Seshagiri Rao
President

Sri Paladugu Paparao
Vice President-1

Sri Burle Venkata Siva Rama Krishna
Vice President-2

Sri Manam Nageswara Rao
Secretary



Sri Panguluri Bhavannarayana Chowdary
Jt. Secretary & Correspondent

Sri Chandrapati Venkaiah
Treasurer

The management members are imbued with a spirit of selfless service and believe in the principle of Academic autonomy. Transparency of all financial transactions is strictly adhered and all payments and receipts are through bank transactions only. The Management obtains objective feedback about all aspects of the college and suitably advises and motivates employees in a discrete manner. As a mark of commitment to good management, rules and regulations are applied with justice and fair play. Above all, the management makes all out effort to provide healthy environment on the campus. (Lawns, Greenery including 1000 neem trees and CC roads provided)

MESSAGE FROM PRINCIPAL

Dr. V. Damodara Naidu
B.TECH. (Mech.), M.TECH. (Prod), IIT-Kgp, PH.D., JNTUH

A warm welcome to NAAC accredited Bapatla Engineering College (BEC). The Bapatla Engineering College (Autonomous), one of the seven educational institutions sponsored by the Bapatla Education Society, was established in 1981 with a vision to impart quality technical education and is affiliated to Acharya Nagarjuna University. The College is credited with beautifully laid out and thoughtfully designed. The college has well qualified faculty members from IITs, NITs and reputed universities and has 63 doctorates and more than 60 faculty pursuing Doctorate degrees.

The college is one of the first generation self-financed engineering colleges started in the year 1981 and is regarded as one of the best engineering colleges in the state of Andhra Pradesh.

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

The college is chosen by several world renowned leaders such as Bosch Rexroth Center of Competence in Automation Technologies, Siemens Center of Excellence and Kuka Robotic Technology Center to have their centers of research and innovation under one roof in a unique Research Park established at a cost of Rs.20 Crores.

BEC has taken the class room teaching to world class level through the two-way interactive Digital Media System. We are member of Indian Society for Technical Education (ISTE), Computer Society of India (CSI) etc. Various workshops, seminars, conferences, and Faculty Development Programs (FDP) are conducted through ISTE, and add-on courses and several skill development programs are being organized by the college.

The Department of Training and Placement facilitates the maximum employment opportunities to all the deserving candidates of final and pre-final year students. Many of our Alumni are decorating the top positions at many reputed Multi-National Companies.

We always look at the employability skills and try to perfectly match with the requirements of the Industry. We impart training in Technical Skills and Life Skills (Soft Skills) as a part of our curriculum to mould and shape the personalities and make the students employable. In order to shape the life skills (soft skills), we are imparting regular training internally and through external resources as well.

We emphasize mainly on Assessment and Evaluation, analyzing the training needs of each candidate, and provide Career Guidance and Counseling. The college provides Training on Business English Communication Skills, Aptitude, Domain skills as needed by the Industry. We promote industrial visits and knowledge sessions to make students familiar with industrial practices. The college encourages students to pursue internships to gain work experience in industries and increase their employability. EDP Cell conducts various programs to develop entrepreneurship culture among students. Over 50 companies visited our college, and more than 65% of eligible students have been placed in various reputed companies for the academic year 2018-19. The students of the college continuously excel in national and international competitive examinations like GATE, IELTS, GRE and TOEFL. We have several Industry MoUs which will help to train faculty and students on latest trends in the technology. Some of the MOUS are listed below:

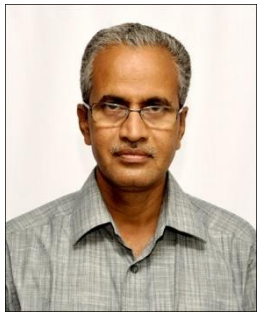
1.	NASSCOM, Delhi.	CSE/IT
2.	New Mexican State University, NEW Mexico, USA.	All Depts.
3.	Acer Engineers Private Limited, Hyderabad.	Civil Engg.
4.	ICT Academy, Chennai	All Depts.
5.	Caddy Code Solutions Pvt Ltd., Bangalore	IT
6.	APHRDI, Govt. of AP	All Depts.
7.	Sri Lakshmi Ganapathi Engineering Works (to be signed), Tenali.	Mech. Engg.
8.	Satyam Ventures Engineering Services Private Limited, Hyderabad (to be signed)	Mech. Engg.
9.	Construction Industry Development Council, Delhi	Civil Engg.
10.	Microlink Peripheral Controls Pvt. Ltd., Vijayawada	ECE
11.	SRC E-Solutions, Vijayawada	ECE
12.	BT & BT Management consultancy Pvt. Limited. (to be signed)	All Depts.

The college is enriched with Centre for Innovation Incubation and Entrepreneurship (CIIE) and well-established library with Digital Library facility that caters to the needs of student. The institution is a hub of Student clubs that helps them to gratify their creative and innovative minds and weaving social responsibility with leadership qualities among students. The college also provides amenities like subsidized transportation, food court, mineral water, internet, Bank, Post office, Ladies Hostel and Dispensary equipped with an ambulance for the convenience of faculty, staff and students.

We have Governing body (Autonomous), College Academic Council for the continuous improvement of academic performance. We have formed several Committees for Grievance and Redressal, Examination, Admission, Library, Student Welfare, Internal Complaints, Extra-Curricular Activities, Academic Audit, Disciplinary, Research, Sports, Training and Placement, Alumni Affairs, Anti-Ragging, Campus Facilities, and Maintenance under Planning and Evaluation Committee.

We wish all the students to utilize the infrastructure and the experienced faculty of our institution to equip themselves with emerging technologies and innovative skills that make them lead the nation in to new heights of advancement and development to enrich every citizen’s life.

Heads of Departments



Dr. J. S. Rao
Head, Chemical Engg. & COE

Dr. Naga Satish
Head, Civil Engineering

Dr. Shaik Nazeer
Head, CSE

Dr. B. Chandra Mohan, Head, ECE

Dr. N. Rama Devi
Head, EEE

Prof. Ch. Ramesh
Head, EIE

Prof. N. Siva Rama Prasad
Head, IT

Dr. T Nancharaiah
Head, Mechanical Engg.

Dr. P. Vijaya Saradhi
Head, Mathematics

Dr. K. Rama Krishna
Head, Physics

Dr. V. Madhava Rao
Head, Chemistry

Dr. P. AshaMadhavi
Head, English

Mr. K.N. Prasad
Head, MCA

Mr. A. Rama Mohana Rao
Librarian

Mr. Justin Chako
Head, Placements

Dr.T.Chandrasekhara Rao, Warden, Campus Hostel

Mr. Meeravali Shaik
Physical Director

Mr. D. Gopala Krishna
Office Superintendent

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

Academic Rules & Regulations for B. Tech Program

(Approved by Academic Council & Governing Body of the College held on August 2018)

(Amended in August 2019; Effective for students admitted into First year B.Tech from the academic year 2018-2019 onwards – R18 Regulations).

1.0 EXTENT: All the rules and regulations, specified herein after, shall be read as a whole for the purpose of interpretation and when a doubt arises, the interpretation of the Chairman, Academic Council, Bapatla Engineering College (Autonomous) is final. As per the requirements of the Statutory Bodies, The Principal, Bapatla Engineering College (Autonomous), shall be the Chairman of the College Academic Council.

1.1DURATION OF THE PROGRAMME AND MEDIUM OF INSTRUCTION: The duration of the B.Tech. Programme is for four academic years consisting of two semesters in each academic year. The medium of instruction and examinations is English.

2.0 ADMISSIONS:

2.1 Admission into the First year of any Four Year B.Tech. Programmes of study in Engineering: Admissions into the first year of B.Tech. Programme of Bapatla Engineering College (Autonomous) (***Subsequently referred to as*** **B.E.C**) will be as per the norms stipulated by the Govt. of Andhra Pradesh from time to time.

2.2 Admission into the Second year of any Four year B.Tech. Programmes of study in Engineering as Lateral Entry Student**:** Admissions into the second year of B.Tech. Programme of B.E.C will be as per the norms stipulated by the Govt. of Andhra Pradesh from time to time.

2.3 Admissions with advance standing: These may arise in the following cases:

1) When a student seeks transfer from other colleges to B.E.C and intends to pursue B.Tech at B.E.C in an eligible branch of study.
2) When students of B.E.C get transferred from one regulation to another regulation or from previous curriculum to revised curriculum.
3) When a student, after long discontinuity, rejoins the college to complete his/her Programme of study for the award of the degree.

These admissions may be permitted by the Academic Council of B.E.C as per the norms stipulated by the statutory bodies and the Govt. of Andhra Pradesh from time to time. In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained and the Programme of study at B.E.C will be governed by the transitory regulations stipulated in ***4.3.3 and 4.3.4.***

3.0 Details of the Program:

S.No	Activity	Description
1.	Number of Semesters in an Academic Year	Two
2.	Course Work	15 Weeks. 90 instructional days.
3.	Evaluation	As per the Assessment and Examination Policy.

4.0 Programmes of study in B.Tech:

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

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

4.2 Structure of the Programme:

As per the Program Review Policy & AICTE model curriculum guidelines.

4.3 **Transitory Regulations**: For students admitted under advance standing (mentioned in 2.3) these transitory regulations will provide the *modus operandi*.

At the time of such admission, based on the Programme pursued (case by case)

1) Equivalent courses completed by the student are established by the BOS concerned.
2) Marks/Credits are transferred for all such equivalent courses and treated as successfully cleared in the Programme of study prescribed by the concerned BOS.
3) A Programme chart of residual courses not cleared will be derived and a Programme of study with duration specified will be prescribed for pursuit at B.E.C.
4) Marks obtained in the previous system, if the case be, are converted to grades and CGPA is calculated accordingly.

All other modalities and regulations governing shall be the same as those applicable to the stream of students with whom such a candidate is included into.

4.4 Curriculum for each Programme of study:

1) The Four year curriculum of any B.Tech Programme of study in any branch of engineering is formulated based on the guidelines mentioned in 4.2 and will be recommended by the Board of Studies concerned and is approved by the Academic council of the college.
2) In the case of students admitted through lateral entry, the respective regular curriculum from the second year onwards is to be pursued by such students. Foundation courses may be added if necessary.
3) In the case of students admitted under advanced standing, the equivalency will be prepared by the Department Committee and to be approved by the Board of Studies concerned and the Academic Council.
4) After approval from the Academic Council, Department informs the courses to be taken by all the students along with the academic regulations.

Table below shows a typical curriculum frame work for B.Tech Degree program.

S.No.	Subject Area	Average no. of credits
1.	Humanities & Social Sciences courses	12 - 14
2.	Basic Science Courses	21 – 28
3.	Engineering Science	18 - 21
4.	Professional Core courses	65 – 78
5.	Professional Elective Courses	15 - 21
6.	Open Electives	6 – 12
7.	Major Project / Seminar, etc	12
8.	MOOCs	2
9.	Summer Internship	2
10.	Mandatory courses (2 courses)*	0
	TOTAL	165 - 170

The students admitted through the **Lateral Entry scheme** have to complete **125 – 130** credits.

*For mandatory courses as suggested by UGC / AICTE no credits are allocated but obtaining pass grade in these subjects is compulsory to obtain degree.

4.5 The Maximum duration permitted to pursue the programme and cancellation of admission:

4.5.1 The maximum duration permitted for any student to successfully complete any four year B.Tech. Programme of study shall be:

1) Eight academic years in sequence from the year of admission for a normal student admitted into the first year of any Programme,
2) Six academic years in sequence from the year of admission for a Lateral entry student admitted into the second year of any Programme, and
3) For students admitted with advanced standing, the maximum time for completion of Programme study shall be twice the period in terms of academic years in sequence, stipulated in the Programme curriculum defined at the time of admission.

4.5.2 In case, any student fails to meet the applicable conditions for the eligibility of degree in the maximum stipulated period as mentioned in ***4.5.1***, his/her admission stands cancelled and no degree will be awarded.

5.0 EXAMINATION& EVALUATION:

The performance of the students in each semester shall be assessed course wise. All assessments will be done on absolute mark basis. However, for the purpose of reporting the performance of a candidate, letter grades and grade points will be awarded as per section ***9.1.***

EVALUATION:

The performance of the students in each semester shall be assessed course wise. All assessments will be done on absolute mark basis. However, for the purpose of reporting the performance of a candidate, letter grades and grade points will be awarded. The performance of a student in each course is assessed with alternate assessment methods, term examinations on a continuous basis during the semester called Continuous Internal Evaluation (CIE) and a Semester End Examination (SEE) conducted at the end of the semester. For each theory, design and/or drawing course, there shall be a comprehensive Semester End Examination (SEE) of three hours duration at the end of each Semester, except where stated otherwise in the detailed Scheme of Instruction.

The distribution of marks between Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) to be conducted at the end of the semester will be as follows:

Nature of the Course	**CIE**	**SEE**
Theory subjects	50	50
Drawing	50	50
Practical	50	50
Term Paper	50	50
Project work	75	75

5.1 Continuous Internal Evaluation (CIE) in Theory and Drawing subjects:

In each Semester there shall be two Term examinations and some ***Alternate Assessment Tools (AAT)*** like Home Assignment, Class Test, Problem Solving, Group Discussion, Quiz, Seminar and Field Study in every theory course. The Alternate Assessment Tools with detailed modality of evaluation for each course shall be finalized by the teacher concerned before beginning of the course. It will be reviewed and approved by the Department Committee.

The Term Examination is conducted in the regular mode according to a schedule which will be common for a particular year of study. The maximum weightage for Term Examinations, AATs and the calculation of marks for CIE in a theory course is given in the following table.

Particulars	Term Exams (Max. 20 marks)	AAT (Max. 30 marks)
Better Performed exa	75% of marks obtained	Continuous assessment by teacher as per the predetermined course delivery & assessment plan. (Min. two assessments)
Other exam	25% of marks obtained	

A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in that course and eligible to write the SEE of that course.

Semester End Examination (SEE) in Theory, Design and/or Drawing course:

a) For each theory, design and/or drawing course, there shall be a comprehensive Semester End Examination (SEE) of three hours duration at the end of each Semester for 50 marks, except where stated otherwise in the detailed Scheme of Instruction. Question paper setting shall be set by the teacher or teachers together in a multi section courses and to be verified as described in policy document.

b) A minimum of 20 (40%) marks are to be secured exclusively in the Semester End Examination (SEE) of theory, design and/or drawing course in order to be declared as passed in that course and for the award of the grade in the course.

5.3 Continuous Internal Evaluation (CIE) in laboratory courses:

The evaluation for Laboratory course is based on CIE and SEE. The CIE for 50 marks comprises of 20 marks for day to day laboratory work, 15 marks for record submission and 15 marks for a laboratory examination at the end of the semester.

In any semester, a minimum of 90 percent of prescribed number of experiments / exercises specified in the syllabi for laboratory course shall be taken up by the students. They shall

complete these experiments / exercises in all respects and get the record certified by the internal lab teacher concerned and the Head of the Department concerned to be eligible to appear for the Final Examination in that laboratory course.

A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in that lab course and eligible to write the SEE of that lab course.

5.4 Semester End Examination (SEE) in laboratory courses:

a) For each laboratory course, the Semester End Examination (SEE) shall be conducted by one internal and one external examiner appointed by the Principal and the duration of the exam shall be for three hours. The SEE is for 50 marks which include 10 marks for write up, 20 marks for lab experiment/exercise, 15 marks for Viva-voce and 5 marks for general impression.

b) A minimum of 20 (40%) marks shall be obtained in SEE of a laboratory course in order to be declared as passed and for the award of the grade in that laboratory course.

5.5 Evaluation of Term Paper:

a) A term paper is to be submitted by each student in the 7^{th} semester which would be a precursor to the project work to be done in the 8^{th} semester. The evaluation is based on CIE for 50 marks, which includes a minimum of two seminars/presentations for 20 marks and the report submitted at the end of the semester which is evaluated for 30 marks.

b) A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in the Term Paper and eligible to write the SEE in the Term Paper.

c) The Semester End Examination (SEE) shall be conducted for 50 marks by one internal and one external examiner appointed by the Principal. The SEE contains Viva-voce and the demonstration of the model developed or work performed as a part of the term paper.

d) A minimum of 20 (40%) marks shall be obtained in SEE of the term paper in order to be declared as passed and for the award of the grade in the term paper.

5.6 Evaluation of the Project

a) In case of the Project work, the evaluation shall be based on CIE and SEE. The CIE for 50 marks consists of a minimum of two Seminars / presentations for 20 marks and the Project Report submitted at the end of the semester which is evaluated for 30 marks.

b) A minimum of 25 (50%) marks are to be secured exclusively in the Continuous Internal Evaluation (CIE) in order to be declared as passed in the Project Work and eligible to write the SEE in the Project Work.

c) SEE shall be evaluated in the form of a Viva- voce and the demonstration of the thesis work for 100 marks. Viva-voce Examination in Project Work shall be conducted by one internal examiner and one external examiner to be appointed by the Principal.

d) A minimum of 40 marks shall be obtained in SEE exclusively in order to be declared as passed in the Project and for the award of the grade.

NOTE : A student who is absent for any Test / Exam / Seminar / Presentation as a part of Continuous Internal Evaluation (CIE), for any reason whatsoever, shall be deemed to have scored zero marks in the respective component and no provision for make-up shall be provided.

5.7 Course Repetition (Repeater course)

The students not qualified to write SEE in a course may register for the repeater courses through course repetition and summer semester. The students have to apply to the Principal through the respective HOD by paying prescribed fees.

Course repetition: A student can take up a maximum of two theory courses in a semester immediately after the semester end examinations of that particular semester in accordance with the guidelines recommended by the Academic Council. The students who are not taking regular semester courses may additionally register for one more theory course.

Summer semester: Further the students can register maximum three (theory + lab courses together) courses in the summer semester. Summer semester courses shall be of both even & odd semesters. Summer semester shall be conducted immediately after completion of even semester end examinations.

The HODs concerned have to allot a teacher related to that course to conduct class work. The minimum number of periods to be conducted should not be less than 75% of the total prescribed periods for that course. The classes will be conducted in the vacation period or in the weekends or in the afternoons as decided by the HOD concerned. Teacher has to evaluate the student for his performance in CIE as per the autonomous norms and the qualified students should appear for a semester end examination. The pass criteria in both CIE & SEE should be as per autonomous norms.

The documents for monitoring the candidates registered for course repetition are available with the Heads of the Departments and Exam Section.

6.0 ATTENDANCE REGULATIONS:

All students shall maintain a minimum attendance of 75% in each course registered. The attendance percentage is computed by considering total number of periods conducted in a course as the denominator and the total number of periods actually attended by the student in that course, as the numerator.

In case of shortfall in this, the Principal of the College shall consider and may condone deficiency up to a limit of 10% in special cases for reasons such as medical emergencies, participation in sport, cultural activities, seminars, workshops and paper presentation etc. at the level of University, State, and National after due recommendation by the concerned Head of the Department.

For the above cases student must take prior permission from the head of the department to participate in such events and in case of medical emergencies intimation should be given immediately and submit the medical certificate to the concerned Head of the Department. Any student failing to meet the above standard of attendance in any course(s) registered, shall not be allowed to appear for SEE of such course(s). The student seeking condonence of attendance on the above grounds has to pay the condonence fee as specified by the college.

Further a student, who could not satisfy the minimum attendance of average 75% in all the courses put together (or 65% in special cases as mentioned above) in any semester, is not eligible to appear for the Semester End examinations and shall have to repeat that semester in the subsequent year.

6.1 Attendance at CIE and SEE: Attendance at all examinations, both CIE and SEE of each course registered shall be compulsory for the students and there shall not be any provision for re-examinations/consideration.

6.2 Any student against whom any disciplinary action by the College is imposed shall not be permitted to attend any SEE in that Semester.

6.3 The basis for the calculation of the attendance shall be the period prescribed by the College by its calendar of events. For the first semester students, the same is reckoned from the date of admission to the course.

6.4 The students shall be informed about their attendance position periodically by the College so that the students can strive to make up the shortage. However, non-receipt of such information from the college will not be considered as valid reason for exemption from the attendance requirements.

6.5 If a student does not fulfil the attendance requirements in any subject, he/she is not permitted to attend the Semester End Examination in that subject and is deemed to have been awarded “F’ grade in that subject.

7.0 DETENTION: A student is said to have been detained and not allowed to appear for Semester End Examination (SEE) at the end of the semester when

7.1 The student does not have a minimum average 75% attendance or 65% attendance with condonation in all subjects put together in that semester.

7.2 Such a student shall have to repeat the same semester subsequently and satisfy the above requirements afresh to become eligible to appear for the Semester End Examination (SEE), conducted at the end of the semester.

8.0 CONDITIONS FOR PROMOTION:

8.1 A student not detained in the first semester of a year of study shall be promoted to second semester of that year of study.

8.2 A student shall be eligible for promotion to III semester of B.Tech. Programme, if he/she is not detained in the second semester (of first year B.Tech. Programme) irrespective of the number of backlog courses (in terms of credits not earned) in I year B.Tech. (i.e. I & II semesters together).

8.3 A student shall be eligible for promotion to V semster of B.Tech. Programme, if he/she is not detained in the IV semester and also must secure 50% of the credits of the subjects (including laboratory courses, MOOC courses etc as per curriculum) that have been studied in I & II semesters irrespective of whether the candidate takes the end examination or not as per the normal course of study. At the time of commencement of class work for the V semester, student must secure the required credits.

8.4 A student shall be eligible for promotion to VII semester of B.Tech. Programme, if he/she is not detained in the VI semester of B.Tech. Programme and also must secure 50% of the credits of the subjects (including laboratory courses, MOOC courses etc as per curriculum) that have been studied upto IV semester. At the time of commencement of class work for the VII semester, student must secure the required credits.

And in case of getting detained for shortage of earned credits as per above, the student may make up the credits through supplementary exams for the failed courses before the date of commencement of class work for V or VII semester respectively.

7.0 Reregistration of not qualified courses in CIE for lack of attendance or lack of marks:

Students who failed to secure minimum attendance (75%) and minimum percentage of marks (50%) in CIE specified in any course, he / she will not be allowed to write SEE of that course. Such students have to register and qualify in CIE for those courses through course repletion and summer semester.

Students, who failed after final regular examination (SEE), must appear for the supplementary examinations to be conducted as per the college examination schedule.

Registration: Every eligible student has to register himself / herself at the beginning of every semester indicating all the Courses taken up for pursuit by him / her during that Semester and mentor's signature is mandatory.

8.1 When a student is debarred for one or more semesters, his / her registration in the present semester is cancelled and the student is debarred from registering in future during the debarred period.

8.2 In any case, while re-registering in any semester, he or she will have to pay the requisite fee once again.

For extended years of study, students must pay the tuition fees as per the college regulations.

9.0 GRADING SYSTEM

Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester for each course.

Letter Grades: A letter grade is basically a qualitative measure (an alphabet/letter) giving the performance of a student, such as,

Performance	Grade
Extraordinary	A+
Excellent	A
Very Good	B+
Good	B
Average	C
Pass	P
Unsatisfactory/Fail	F

The above grades are based on the marks obtained by the student in both CIE and SEE.

9.1 Grade Points

Depending on the letter grades assigned, a student earns certain grade points. The Colleges follow the 10-point grading system, as given below for absolute grading system.

The letter grades and the corresponding grade points are as given in the Table.

Table: Grades & Grade Points

Grade	Grade Points	% of Marks
A+	10	≥90% – 100%
A	9	≥80% –< 90%
B+	8	≥70% – <80%
B	7	≥60% – <70%
C	6	≥50% –< 60%
P	5	≥45% – <50%
F(Fail)	0	< 45%

9.1.1 The grade points given in above tables help in the evaluation of credit points earned by the student in a Course as the credit points are equal to the number of credits assigned to the Course multiplied by the grade points awarded to the student in that Course. This shall be used in arriving at the Semester Grade Point Average (SGPA) of the student for that semester, as it is the sum of all the credit points earned by the student for all the Courses registered in that semester.

9.1.2 Earning of Credit: A student shall be considered to have completed a Course successfully and earned the credits if he/she secures an acceptable letter grade in the range A+ to P. Letter grade 'F' in any Course implies failure of the student in that Course and no credits earned.

9.2 A student who earns a minimum of 5 grade points (P grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course.

However it should be noted that a pass in any course/term paper/Project shall be governed by the rules mentioned Assessment and Examination Policy.

10.0 GRADE POINT AVERAGE

10.1 The Grade Point Average (GPA) will be calculated according to the formula:

$$GPA = \frac{\sum C_i G_i}{\sum C_i}$$

Where C_i = number of credits for the course *i*,

G_i = grade points obtained by the student in the course.

10.2 Semester Grade Point Average (SGPA) is awarded to candidates considering all the courses of the semester. Zero grade points are also included in this computation.

10.3 To arrive at Cumulative Grade Point Average (CGPA), the formula is used considering the student's performance in all the courses taken in all the semesters completed up to that particular point of time.

10.4 Example

Semester	Course Code.	Credits	Grade	Grade Point	Credit Points	SGPA	CGPA
III	18EC301	3	C	6	18		
III	18EC302	3	B	7	21		
III	18EC303	3	A	9	27		
III	18EC304	4	P	5	20		
III	18EC305	4	C	6	24		
III	18EC306	2	B+	8	16	**6.72 (148/22)**	**6.72 (148/22)**
III	18ECL301	1	P	5	5		
III	18ECL302	1	B	7	7		
III	18ECL303	1	A+	10	10		
Total		**22**			**148**		
IV	18EC401	3	P	5	15		
IV	18EC402	3	B	7	21		
IV	18EC403	4	A+	10	40		
IV	18EC404	4	C	6	24		
IV	18EC405	2	A	9	18	**7.40 (163/22)**	**7.06 (311/44)**
IV	18EC406	3	B+	8	24		
IV	18ECL401	1	P	5	5		
IV	18ECL402	1	C	6	6		
IV	18ECL403	1	A+	10	10		
Total		**22**			**163**		

11.0 ELIGIBILITY FOR AWARD OF B.TECH. DEGREE: A student shall be eligible for award of the B.Tech degree if he/she fulfils all the following conditions:

1) Registered and successfully completed all the components prescribed in the Programme of study to which he/she is admitted
2) Obtained CGPA greater than or equal to 6.0 (Minimum requirements for Pass)
3) Has no dues to the Institute, hostels, Libraries, NCC/NSS etc., and
4) No disciplinary action is pending against him/her

12.0 AWARD OF CLASS: A candidate who becomes eligible for the award of B.Tech. Degree shall be placed in one of the following Classes based on CGPA.

Table: CGPA required for award of Degree

Distinction	**≥ 8.0***
First Class	≥ 6.5 < 8.0
Second Class	≥ 5.5 < 6.5
Pass Class	< 5.5

* In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester **in the minimum stipulated period for the Programme**.

If the student did not obtain a CGPA of 6.0 after completing all courses of study, he/she should repeat some courses and obtain higher grade till his/her CGPA is 6.0. Unless he/she obtains a CGPA of 6.0, degree will not be awarded.

12.1 **Grade Sheet:** A grade sheet (Memorandum) will be issued to each student indicating his performance in all courses taken in that semester and also indicating the Grades and SGPA.

12.2 **Transcripts**: After successful completion of the total Programme of study, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee. Partial transcript will also be issued up to any point of study to any student on request and by paying the stipulated fee in force.

12.3 The Academic council of the College approves and recommends the same to Acharya Nagarjuna University for the award of a degree to any student.

13.0 IMPROVEMENT OF CLASS:

13.1 A candidate, after becoming eligible for the award of the Degree, may reappear for the Final Examination in any of the theory courses as and when conducted, for the purpose of improving the class. But this reappearance shall be only once and within a period of two academic years after becoming eligible for the award of the Degree.

However, this facility shall not be availed by a candidate who has taken the Original Degree Certificate. Candidates shall not be permitted to reappear either for CIE in any course or for Semester End Examination (SEE) in laboratory courses (including Project Viva-voce) for the purpose of improvement.

14.0 SUPPLEMENTARY EXAMINATIONS: In addition to the Regular Final Examinations held at the end of each semester, Supplementary Final Examinations will be conducted during the academic year. Candidates taking the Regular / Supplementary examinations as Supplementary candidates may have to take more than one Final Examination per day.

15.0 INSTANT SUPPLEMENTARY EXAMINATIONS: Candidates who fail in one theory course of VIII semester can appear for Instant Supplementary Examination conducted after declaration of the revaluation results of the said exam.

16.0 MALPRACTICES:

The Principal shall refer the cases of malpractices in Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) to an Enquiry Committee constituted by him / her. The Committee will submit a report on the malpractice allegedly committed by the student to the Principal. The Principal along with the members of the Committee is authorized to award a punishment as per the norms, if the student is found guilty.

16.1 To prevent the students indulging in Malpractices through latest electronic gadgets such as Cell-phones, Pagers, Organizer PDAs and Palmtops in addition to chits, printed material etc. in the examination halls, students shall be thoroughly checked at the main entrance as well as in the examination halls by the invigilators. The senior staff members appointed as internal flying squad has greater and decisive role to play in this regard.

16.2 A notice displaying the 'SCALE OF PUNISHMENT' shall prominently be displayed at the Main Entrance to the Examination Halls, preferably near the 'Seating Plan Display'.

16.3 If any student is found resorting to malpractice, the matter shall immediately be brought to the notice of Chief/Additional chief superintendent, Flying squad by the invigilator concerned.

16.4 The above staff members will then prepare a detailed report on the spot in proforma-I (copy enclosed) of the case. The full details of the offence and the details of supporting material must be written in establishing the case. The residential addresses of the students involved in malpractice shall be noted with contact telephone numbers in the malpractice report.

16.5 A written statement is to be obtained from the candidate. If any candidate refuses to give the written statement, the same shall be recorded by the invigilator with the signature of another invigilator as witness.

16.6 Whatever be the supporting material for establishing the case of malpractice, the same are to be confiscated immediately for sending the same to the Malpractices prosecuting committee as a proof.

16.7 The supporting materials so confiscated shall be signed by the chief superintendent and flying squad/invigilator and shall be attached and tagged properly to the scripts of the malpractice cases and are to be sent toMalpractices prosecuting committeealong with the report (proforma enclosed).

16.8 Any representation to relax the punishment will not be entertained by Malpractices prosecuting committee.

16.9 The answer scripts of the candidates who resorted to mal-practice shall be packed in a separate sealed cover duly subscribing on the cover as "MAL-PRACTICE" and send the same to Malpractices prosecuting committee.

16.10 Any student who is arrogant and does not follow the examination rules shall be sent out of the examination hall after collecting his question paper and answer book. Complaints on such cases shall be lodged to the Principal irrespective of imposter is an examinee or an outsider.

SCALE OF PUNISHMENT FOR MAL-PRACTICE CASES

Rule No.	Nature of Offence	Scale of Punishment
01	Writing unparliamentary / vulgar / obscene / words or Language in the answer book. OR Refusing to obey instructions of Chief Superintendent / Invigilator.	The performance of the candidates in that subject shall be cancelled. Further the case should be referred to the disciplinary committee by Chief Superintendent / Malpractices prosecuting committee. If the student repeat the same offence, the performance of the candidate in the semester examination in ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) shall be cancelled
02	A candidate found in possession of any relevant material pertaining to the day of examination such as Papers, Books, Notes OR Notes written on any part of the clothes dressed by the candidate or any part of his/her body or any part of Table or Desk; OR Foot rule, instruments like setsquare, protractor, calculator, mobile phones, etc., with notes written on them. OR Mass copying at the examination centre detected during the conduct of examination or during valuation.	The candidate is to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. He/she shall be allowed to appear for the remaining subjects in that examination by obtaining duplicate hall ticket. The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination.
03	A candidate found having copied or indulging in copying from any paper, book or notes or any other source or allowed or is found allowing any other candidate to	The candidate is to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. He/she shall be allowed to appear for the remaining subjects in that examination by

	copy any matter from his/her answer book or to have in any manner rendered any assistance to another candidate, or if he/she is found to have been receiving assistance from another candidate. OR Destruction or suppression of the evidence of the forbidden material in any way like swallowing, tearing or throwing outside etc.	obtaining duplicate hall ticket. The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination.
04	Copying detected on the basis of internal evidence such as during valuation/special scrutiny	The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination. Note for MPC: "The Malpractice Prosecuting Committee which awards the punishment to the candidates involved in the malpractice has to make sure of the involvement of the Candidate/s in the offence before any punishment is awarded to the candidate/s."
05	Throwing of Question paper after writing the answers on it to the other candidate(s) with the intention to help the other candidate(s). OR Throwing / Sending the Question paper/ questions contained in the question paper on any sheet/article out during the period of examination with an intention to receive assistance and caught by the Invigilator or by an Officer involved in the conduct of examinations	The candidate is to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. He/she shall be allowed to appear for the remaining subjects in that examination by obtaining duplicate hall ticket. The performance of the candidates in that subject shall be cancelled. Further depending on severity of offence or reoccurrence of the offence by the student, the Malpractices prosecuting committee may impose the cancellation of performance of the candidate in two or more or ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) in that semester examination.
06	Exchanging intentionally the answer scripts with a view to give or take help from another examinee.	The candidates (both who helps and who takes help) are to be sent out of the examination hall immediately after obtaining his/her written explanation and duly confiscating his/her Hall-ticket. The performance of all the candidates involved in the act in all subjects in that particular year/semester examination (whole/ part examination, as the case may be, including Practicals) shall be cancelled.

07	Taking away the answer book or leaving the examination hall without handing over the answer book to the Invigilating Staff whether returned Subsequently or tearing the answer Book.	The performance of the candidate in all subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and shall not be permitted to appear for whole/part examination, as the case may be, for next subsequent semester examinations.
08	Writing of answers in the answer book by his/her associates in the examination hall or at any other level.	The performance of all the candidates involved in the act in all subjects in that particular year/semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and the candidates shall not be permitted to appear for TWO subsequent semesters examinations and they shall not be permitted to study the next higher class (debarred for one semester).
09	Obstructing the Chief Superintendent from performing his/her duties, abusing, threatening and showing disrespect towards Invigilator/ Chief Superintendent/ any other official connected with the conduct of examination within the institution premises.	The culprits are to be handed over to the Police immediately and a Criminal case is to be booked against them. The performance of the candidate in the particular year/ semester examination in ALL SUBJECTS (whole/part examination, as the case may be, including Practicals) shall be cancelled and the candidates shall not be permitted to appear for TWO subsequent semesters examinations and they shall not be permitted to study the next higher class (debarred for one semester).
10	Substitution of answer book. OR Insertion of drawing sheets or replacement of main answer book written outside with one written inside the examination hall.	The performance of the candidate in all subjects in that semester examination (whole/ part examination, as the case may be, including Practicals) shall be cancelled and the candidate shall not be permitted to appear for TWO subsequent examinations and he/she is not permitted to study next higher class (debarred for one semester).
11	Impersonation.	The performance of both the candidates, i.e., the impostor and the candidate, who is being impersonated, in all subjects in that semester examination (whole/ part examination, as the case may be, including Practicals) shall be cancelled and they are not permitted to study and appear for any examination for the next THREE semesters (including academic year in which the impersonation has taken place) in respect of either or both the candidates. A Criminal case may be lodged in the Police Station if the impostor is an outsider
12	Physical assault within the institution premises on personnel connected with the conduct of examinations.	The performance of the candidate in all the subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled and the

		candidate shall not be permitted to appear for THREE subsequent examinations and he/she is not permitted to study next higher class (debarred for two semester), if any, till he/she completes the punishment period. A Criminal / Disciplinary case is to be booked against the culprits involved in the act.
13	Possession of blank main answer book/ additional answer book/ drawing sheet/ graph sheet which have not been issued in the Examination hall on the day of exam.	A Criminal / Disciplinary case is to be booked against the candidate. The matter should be brought to the notice of the authorities for initiation of appropriate action against all the guilty. The performance of the candidate in all subjects in that semester examination (whole/part examination, as the case may be, including Practicals) shall be cancelled.
14	Other offences, if any, not covered under the above provisions.	The Malpractice Prosecuting Committee shall make specific recommendations on the punishment to be awarded keeping in view the gravity of offence and also the scale of punishment, as above.

N O T E:

1. No re-examination shall be conducted, where candidates resort to boycott of examinations on any pretext.
2. In case a candidate resorting to malpractice by copying from any material in his/her possession and/or by any means is caught by the Flying Squad or Observers or any other Officer posted for duty for the examination, the explanation of the Invigilator in that particular hall of examination shall be called for, for not detecting the same and appropriate disciplinary action be initiated against him/her, after examining his/her explanation in the matter.
3. In all the malpractice cases the report made by the Invigilators should be thoroughly enquired into by the Chief Superintendent concerned and he/she should satisfy himself/herself with all the details in the Invigilators report and record the same in his/her report.
4. In cases where there is a laxity on the part of invigilators and chief superintendents and other officials connected with the conduct of examinations in the discharge of their duties properly, such as in cases where mass copying is reported in an examination hall or where the candidate involved in malpractice in an examination hall is booked by flying squad or others but not the invigilator, then appropriate disciplinary action should be taken against all the staff members involved, after giving them notice and considering their explanations, if any, offered.
5. Punishment for different offences committed in all cases and its duration is mentioned above. It is quite possible that in few cases, the punishment recommended to the candidates, may exceed, the validity of the Curriculum in existence. In such cases, the punishment period should be limited to that extent within which the candidate has to obtain his/her B.Tech. In certain cases, the candidate may not get any more chances to appear for examination and qualify for the award of B.Tech. The candidate will have to suffer the consequence for his/her misdemeanor.
6. In all cases of Malpractice, the hall ticket of the candidate is to be confiscated and shall be sent to the Malpractices prosecuting committee along with the answer script in separate cover. The candidate shall not be permitted to appear for the remaining subjects if any, in that examination.

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

PROFORMA - I

BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

MAL-PRACTICE CASE REPORT

1. Examination Hall : _____

2. Date of Examination : _____

3. Time of Examination : _____

4.a) Course : _____

b) Year/Semester : _____

c) Scheme : _____

5. Subject in which candidate is booked:
   a) Subject Code : _____
   b) Subject : _____

6. Particulars of the candidate booked:
   a) Regd. No. : _____
   b) Name : _____
   c) Residential address : _____
   : _____
   : _____

7. (a) Case booked by : Invigilator / Squad Members / Surprise Check Squad / Other Invigilator / Chief superintendent / Examination officers (Strike out whichever is not applicable)
   (b) Name & Designation of the Staff who booked the case : _____
   (c) Name & Designation of the Other invigilators in the Hall : _____
   as witness. : _____

8. Give Full Details of the Offence : _____
   _____
   _____
   _____
   _____
   _____

9. Give full details of Supporting material like Written Chits, Printed material, Mobile Phones, Books, Matter written on Scale, Calculator case etc., (matter should be related to the subject of examination on that day). If copied, the copied matter is to be marked in the supporting material and write Regd. No. of the candidate on the supporting material and should be sent to this office along with the answer booklet.

11. Signature of the Invigilator : _____
(whether the case is booked by him or by other officials)

12. Whether the student has given : YES / NO
the statement or not ?

13. Signature of the candidate : _____

14. Remarks of the : _____

Chief Superintendent _____

_____

_____

SIGNATURE OF THE CHIEF SUPERINTENDENT

Encl: 1) Answer-script
2) Forbidden confiscated material
3) Statement of Student.

17.0 AMENDMENTS TO REGULATIONS:

The Academic Council of Bapatla Engineering College (Autonomous) reserves the right to revise, amend, change or nullify the Regulations, Schemes of Examinations, and/ or Syllabi or any other matter pertained that meets to the needs of the students, society and industry without any notice and the decision is final.

DISCIPLINE AND CODE OF CONDUCT FOR STUDENTS

The following are some of the important rules of discipline. All students are required to be aware of and act consistently with these values.

1. Students must punctually attend all lectures, practicals, tutorials, assignments, tests, examinations, etc. A student whose attendance and/or progress in the various tests and examinations are not satisfactory and who does not perform the required number of assignments, tutorials and/or practicals are likely to lose their terms. Prolonged absence even on ground of ill health may also lead to loss of terms. Defaulters will not be sent up for Final /University Examinations.
2. The identity card is meant for identifying bonafide students and is used for permitting the students to participate in various activities and programs of the college. Every student must wear Identity card as long as he/she is in the college campus. It must be produced by the student whenever demanded by the member of the teaching or non-teaching staff of the college. Every student must wear his/her Identity card in the college every day. He/She must take proper care of it to avoid its misuse by other students and outsiders. In case the Identity card is lost, the matter should be immediately reported to the Principal and an application should be made for a duplicate Identity card, which will be issued on payment of charges.
3. The conduct of the students in the classes and in the premises of the college shall be such as will cause no disturbance to teachers, fellow students or other classes.
4. Every student shall wear a clean formal dress while coming to the college also when representing the college for various activities out station.
5. No Society or Association shall be formed in the College and no person should be invited in the college campus without the specific permission of the Principal.
6. No student is allowed to display any Notice/Circular/Poster/Banner in the College premises without the prior permission of the Principal.
7. Using foul language in the college campus is prohibited. If any student is caught using foul language, disciplinary action shall be initiated against the student.
8. Use of **BEC name tag or logo** by the students for their caste, political, religious, personal reasons is prohibited. Further placing banners on caste, political, religious, personal reasons, promoting cinema heroes & political leaders, taking possessions and burning fire crackers in front of the college is strictly prohibited. If any student is involved in such activities in and around the campus, severe disciplinary action will be taken including rusticating from the college and filing a criminal case.
9. Outsiders are not permitted in the college premises without the prior permission of the Principal. College students are not allowed to bring their relatives/friends to the college premises without the permission of the principal.

10. All meetings, cultural programs, debates, elocutions etc. organized on the college premises must be held in presence of teaching staff members and with the prior permission of the Principal. The subjects of debates/elocutions must have the prior approval of the principal.
11. Conducting fresher's meet, farewell meets etc. by the students outside the campus are prohibited. If any student is involved in such activities (organizing as well as participating), severe disciplinary action will be taken including rusticating from the college.
12. Students must take proper care of the college property. Strict action will be taken against students damaging College property and will be required to compensate the damage.
13. Students should not be involved in academic offences including cheating or plagiarism in academic course work malpractices at the College/Board/University Examinations
14. Smoking is strictly prohibited in the college premises.
15. If, for any reason, the continuance of a student in the College is found detrimental to the best interest of the college, the Management may ask the student to leave the college without assigning any reasons and the decision will be final and binding on the student.
16. Playing music on Transistors, Tape-Recorders, Car Stereos, Mobile phones or any other similar gadgets with or without earphones is strictly prohibited in the college premises. Defaulters will be punished and their instrument shall be confiscated.
17. Use of Mobile phones is strictly prohibited in the academic area of the college, Defaulters will be penalized and their instrument confiscated.
18. Students who are travelling to college on personal vehicles (2/4 wheelers) need to have valid driving license issued by RTO and follow all the rules listed by RTO. Students have to park the vehicle in the parking area of the college.
19. Students must not hang around in the college premises while the classes are at work.
20. Students must not attend classes other than their own without the permission of the authority concerned.
21. Students shall do nothing inside or outside the college that will interface with the discipline of the college or tarnish the image of the college.
22. Students are not allowed to communicate any information about college matters to Press.
23. Matters not covered above will be decided at the discretion of the Principal.

Acts of misbehavior, misconduct, indiscipline or violation of the Rules of Discipline mentioned above liable for one more punishments as stated below:

A. Warning to the students.
B. Warning to the student as well as inform the parents.
C. Imposition of a fine.

D. Denial of gymkhana, library, laboratory, N.C.C., N.S.S. student aid or any other facility for a specified period or for the whole Term/Year.
E. Expulsion from College for a specified period
F. Cancellation of Terms.
G. Refusal of admission in the term or academic year.
H. Cancellation of admission.
I. Rustication.

Anti Ragging Rules and Regulations
(As per AICTE Norms)

1. What constitutes Ragging: - Ragging constitutes one or more of any of the following acts:

a. any conduct by any student or students whether by words spoken or written or by an act which has the effect of teasing, treating or handling with rudeness a fresher or any other student;
b. indulging in rowdy or undisciplined activities by any student or students which causes or is likely to cause annoyance, hardship, physical or psychological harm or to raise fear or apprehension thereof in any fresher or any other student;
c. asking any student to do any act which such student will not in the ordinary course do and which has the effect of causing or generating a sense of shame, or torment or embarrassment so as to adversely affect the physique or psyche of such fresher or any other student;
d. any act by a senior student that prevents, disrupts or disturbs the regular academic activity of any other student or a fresher;
e. exploiting the services of a fresher or any other student for completing the academic tasks assigned to an individual or a group of students.
f. any act of financial extortion or forceful expenditure burden put on a fresher or any other student by students;
g. any act of physical abuse including all variants of it: sexual abuse, homosexual assaults, stripping, forcing obscene and lewd acts, gestures, causing bodily harm or any other danger to health or person;
h. any act or abuse by spoken words, emails, posts, public insults which would also include deriving perverted pleasure, vicarious or sadistic thrill from actively or passively participating in the discomfiture to fresher or any other student;
i. any act that affects the mental health and self-confidence of a fresher or any other student with or without an intent to derive a sadistic pleasure or showing off power, authority or superiority by a student over any fresher or any other student.

2. Actions to be taken against students for indulging and abetting ragging in technical institutions Universities including Deemed to be University imparting technical education:-

1. The punishment to be meted out to the persons indulged in ragging has to be exemplary and justifiably harsh to act as a deterrent against recurrence of such incidents.
2. Every single incident of ragging a First Information Report (FIR) must be filed without exception by the institutional authorities with the local police authorities.
3. The Anti-Ragging Committee of the institution shall take an appropriate decision, with regard to punishment or otherwise, depending on the facts of each incident of ragging and nature and gravity of the incident of ragging.
4. a) Depending upon the nature and gravity of the offence as established the possible punishments for those found guilty of ragging at the institution level shall be any one or any combination of the following:-
    - (i) Cancellation of admission
    - (ii) Suspension from attending classes
    - (iii) Withholding/withdrawing scholarship/fellowship and other benefits
    - (iv) Debarring from appearing in any test/examination or other evaluation process
    - (v) Withholding results
    - (vi) Debarring from representing the institution in any regional, national or international meet, tournament, youth festival, etc.
    - (vii) Suspension/expulsion from the hostel
    - (viii) Rustication from the institution for period ranging from 1 to 4 semesters
    - (ix) Expulsion from the institution and consequent debarring from admission to any other institution.
    - (x) Collective punishment: when the persons committing or abetting the crime of ragging are not identified, the institution shall resort to collective punishment as a deterrent to ensure community pressure on the potential raggers.

BAPATLA ENGINEERING COLLEGE :: BAPATLA

(Autonomous)

Important Contact Numbers (In case of Ragging)

Sl.No.	Member Category	Name of the Member	Phone No
1.	Principal	Dr. V. Damodara Naidu, M.Tech., Ph.D.	8332857027
2.	**HODs:** Chemical Engg. Civil Engg. CSE ECE EEE EIE IT Mechanical Engg. M.C.A. Mathematics Physics Chemistry English T& P Warden, Campus Hostel Coordinator for anti ragging	 Dr. J.S.Rao, M.Tech., Ph.D. Dr. Ch.Naga Satish Kumar, M.Tech., Ph.D. Dr. Shaik Nazeer, M.Tech., Ph.D., Dr. B. Chandramohan, M.Tech., Ph.D. Dr. N.Rama Devi, M.Tech.,Ph.D., Prof. Ch.Ramesh M.Tech., (Ph.D.) Prof. N.Sivarama Prasad, M.Tech.,(Ph.D.) Dr. T.Nanacharaiah, M.Tech., Ph.D. Sri. K.N.Prasad, M.C.A.,M.Tech., Dr. P.VijayaSaradhi, M.Sc.,M.Phil.,Ph.D. Dr. K.Rama Krishna, M.Sc., Ph.D. Dr. V.Madhava Rao, M.Sc., Ph.D. Dr. P.Asha Madhavi, M.A.,M.Phil.,Ph.D. Mr. Justin Chako Dr. T.Chandrasekhara Rao Mr. Y. Narendra	 9490224100 9440110124 9642302577 9491112477 9703374075 9701407595 9885882200 9492715018 8121708069 9949559288 9441207751 8374498399 9951507742 9845787354 9848276672 9704090941
4.	Police Department	Crime Stopper SP, Guntur Rural SP Camp Office DSP, Bapatla CI, Bapatla Town CI, Bapatla Rural PS, Bapatla Town SI, Bapatla Rural **Anti-Ragging Toll Free**	1090 9440796200 08632234828 9440796165 9440796171 9440796221 08643-224036 9440796258 **18004255314**

BAPATLA ENGINEERING COLLEGE (AUTONOMOUS)

ACADEMIC CALANDER

ACADEMIC CALANDER FOR I & II B.TECH CLASSES

FOR THE ACADEMIC YEAR - 2019-20

I B.TECH. CLASSES

DESCRIPTION	I SEMESTER	II SEMESTER
COMMENCEMENT OF SEMESTER	**05-08-2019**	**02-01-2020**
ORIENTATION PROGRAM	05-08-2019 TO 17-08-2019	---
COMMENCEMENT OF CLASS WORK	19-08-2019	02-01-2020
FIRST MID-TERM EXMINATIONS	15-10-2019 TO 19-10-2019	26-02-2020 TO 02-03-2020
LAST INSTRUCTION DAY	07-12-2019	20-04-2020
SECOND MID-TERM EXAMINATIONS	09-12-2019 TO 13-12-2019	22-04-2020 TO 26-04-2020
PREPARATION HOLIDAYS	14-12-2019 TO 18-12-2019	27-04-2020 TO 01-05-2020
PROPOSED DATE OF SEMESTER END EXAMINATIONS	19-12-2019 TO 31-12-2019	02-05-2020 TO 15-05-2020

II B.TECH. CLASSES: -

DESCRIPTION	I SEMESTER	II SEMESTER
COMMENCEMENT OF CLASS WORK	**24.06.2019**	**02.12.2019**
FIRST TERM EXMINATIONS	04.09.2019 - 11.09.2019	03.02.2020 - 08.02.2020
LAST INSTRUCTION DAY	02.11.2019	28.03.2020
SECOND TERM EXAMINATIONS	04.11.2019 - 09.11.2019	30.03.2020 - 04.04.2020
PREPARATION HOLIDAYS	10.11.2019 - 13.11.2019	05.04.2020 - 08.04.2020
SEMESTER END EXAMINATIONS	**14.11.2019 - 30.11.2019**	**09.04.2020 - 25.04.2020**

Dasara Vacation : 06.10.2019 to 13.10.2019
Pongal Vacation : 12.01.2020 to 19.01.2020

Commencement of class work for the academic year 2020-21 for II & III B.Tech: 15.06.2020

PRINCIPAL

Library resources, facilities & services

The Central Library of Bapatla Engineering College, one of the biggest Libraries in the state with 22,000 Sq feet has been playing a vital role as information centre catering to the academic and learning needs of the students & faculty. The Library received Best Library Award Four times from Acharya Nagarjuna University.

Library Timings: The Central Library functions from 7AM to 7 PM on all working days.

Resources: As a knowledge bank, the Central Library of BEC has a rich collection of 75,317 books, 523 online International technical journals (Science Direct-275 ,IEEE-ASPP-183 ,ASME- 30 ,ASCE-35) and 120 print journals.

Library Automation: The Library catalogue of books (OPAC) & Circulation of Books (Issue & Return of Books) have been fully computerized with SOUL Library Software & Bar coding system for well maintenance and effective functioning of the Library.

Circulation of Books: All the students are allowed to borrow 2 books per head from the Library on their borrower tickets for a period of one week. Students are required to pay fine for the late return of books as per the Library rules.

Reference book service: A separate reference section is maintained in the Central Library with a stack of 14,970 books including encyclopedias, subject hand books & reference text books.

Issue of reference text books: Students may borrow the reference text books half an hour before closing the Library and return the same by 7.30 AM in the next day.

Book Bank facility: A Book Bank is maintained in the Central Library with 20,634 text books for the benefit of SC, ST & BC category students. All SC & ST category students (scholarship holders) are eligible to borrow 12 books per head from Book Bank for each semester. BC category students are allowed to borrow 2 books per head from Book Bank for each semester.

No Dues Certificate: The student who completed the course of study in the College should get a no dues certificate from the Library by returning all the tickets& books borrowed from the College Library & Book Bank.

Library staff: The Central Library has 08 well experienced staff including the Librarian having more than 10 to 25 years of working experience.

Digital Library: A separate Digital Library is maintained in the Central Library with the infrastructure of 28 computers and 3,237 educational CDs. The Digital Library provides internet facility to the students and faculty.

Students can access the full text of the following e resources in the Digital Library.

- International e journals (Science Direct, IEEE, ASME & ASCE)
- NPTEL Video courses developed by all IITs. (Total 236 Courses - 9,173 Lessons)
- e – books and e – journals of DELNET Digital Library

Xeroxing facility: The Library is providing reprographic facility to students to disseminate material quickly and cost effectively at 50ps. per copy.

Bapatla Engineering College **(Autonomous) :: BAPATLA**

DEPARTMENT OF ……..

Academic Year 2019-2020

Schedule for Class Work (*w.e.f. 19-08-2019)*

SEMESTER - I

(Commencement of class work: 19-8-2019)

DAY/TIME	7.30 to 8.15	8.15 to 9.00	9.00 to 9.45	9.45 to 10.30	10.30 to 11.00	11.00 to 11.45	11.45 to 12.30	12.30 to 1.15
MON					Break			
TUE								
WED								
THU								
FRI								
SAT								

Subjects & Staff

SUJECT CODE	FACULTY NAME	PHONE NO	SUJECT CODE	FACULTY NAME	PHONE NO
S1			S6		
S2			L1		
S3			L2		
S4			L3		
S5					

Bapatla Engineering College **(Autonomous) :: BAPATLA**

DEPARTMENT OF ……..

Academic Year 2019-2020

Schedule for Class Work (*w.e.f. 02-01-2020)*

SEMESTER - II

(Commencement of class work: 02-01-2020)

DAY/TIME	7.30 to 8.15	8.15 to 9.00	9.00 to 9.45	9.45 to 10.30	10.30 to 11.00	11.00 to 11.45	11.45 to 12.30	12.30 to 1.15
MON					Break			
TUE								
WED								
THU								
FRI								
SAT								

Subjects & Staff

SUJECT CODE	FACULTY NAME	PHONE NO	SUJECT CODE	FACULTY NAME	PHONE NO
S1			S6		
S2			L1		
S3			L2		
S4			L3		
S5					

Bapatla Engineering College **(Autonomous) :: BAPATLA**

DEPARTMENT OF ……..

Academic Year 2019-2020

Schedule for Class Work (*w.e.f. 24-06-2019)*

SEMESTER - III

(Commencement of class work: 24-6-2019)

DAY/TIME	7.30 to 8.15	8.15 to 9.00	9.00 to 9.45	9.45 to 10.30	10.30 to 11.00	11.00 to 11.45	11.45 to 12.30	12.30 to 1.15
MON					Break			
TUE								
WED								
THU								
FRI								
SAT								

Subjects & Staff

SUJECT CODE	FACULTY NAME	PHONE NO	SUJECT CODE	FACULTY NAME	PHONE NO
S1			S6		
S2			L1		
S3			L2		
S4			L3		
S5					

Bapatla Engineering College **(Autonomous) :: BAPATLA**

DEPARTMENT OF ……..

Academic Year 2019-2020

Schedule for Class Work (*w.e.f. 02-12-2019)*

SEMESTER - IV

(Commencement of class work: 02-12-2019)

DAY/TIME	7.30 to 8.15	8.15 to 9.00	9.00 to 9.45	9.45 to 10.30	10.30 to 11.00	11.00 to 11.45	11.45 to 12.30	12.30 to 1.15
MON					Break			
TUE								
WED								
THU								
FRI								
SAT								

Subjects & Staff

SUJECT CODE	FACULTY NAME	PHONE NO	SUJECT CODE	FACULTY NAME	PHONE NO
S1			S6		
S2			L1		
S3			L2		
S4			L3		
S5					

Notes

Notes

Notes

Bapatla Engineering College

(*Autonomous*)

BAPATLA

B.Tech

Civil Engineering

Curriculum Effective from A.Y. 2018-19 (R18 Regulations)

Bapatla Engineering College:: Bapatla

(Autonomous underAcharyaNagarjuna University)

(Sponsored by Bapatla Education Society)

BAPATLA - 522102 Guntur District, A.P.,India

www.becbapatla.ac.in

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

First Year B.Tech(SEMESTER – I)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18MA001	Linear Algebra and ODE	4	0	0	4	50	50	100	3
18PH002	Advanced Optics and Material Testing	4	1	0	5	50	50	100	4
18CE103	Introduction to civil Engineering	4	0	0	4	50	50	100	3
18EL001	Communicative English	3	0	0	3	50	50	100	2
18CE002	Biology for Engineers	3	0	0	3	50	50	100	2
18PHL01	Physics Lab	0	0	3	3	50	50	100	1
18ELL01	Communication Lab	0	0	3	3	50	50	100	1
18CSL01	Computer Programming Lab	2	0	3	5	50	50	100	2
	NCC/NSS/Internship/MOOCs								
	TOTAL	20	1	9	30	400	**400**	**800**	**18**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

First Year B.Tech(SEMESTER – II)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18MA002	Numerical Methods and Advanced Calculus	4	0	0	4	50	50	100	3
18CY001	Engineering Chemistry	4	0	0	4	50	50	100	3
18CE203	Engineering Mechanics	4	1	0	5	50	50	100	4
18CE001	Environmental Studies	3	0	0	3	50	50	100	2
18CE205	Electrical Technology & Mechanical Technology	4	0	0	4	50	50	100	3
18MEL01	Engineering Graphics	1	0	4	5	50	50	100	4
18CYL01	Chemistry Lab	0	0	3	3	50	50	100	1
18MEL02	Work Shop	0	0	3	3	50	50	100	1
	NCC/NSS/Internship/MOOCs								
	TOTAL	20	1	10	31	**400**	400	800	**21**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

Second Year B.Tech(SEMESTER – III)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18MA003	Probability and Statistics	4	0	0	4	50	50	100	3
18CE302	Surveying	4	1	0	5	50	50	100	4
18CE303	Solid Mechanics	3	1	0	4	50	50	100	3
18CE304	Building Materials, Planning and Construction	4	0	0	4	50	50	100	3
18CE305	Fluid Mechanics	3	1	0	4	50	50	100	3
18HU001	Indian Constitution	2	0	0	2	50	50	100	0
18CEL31	Building Drawing Lab	0	0	3	3	50	50	100	1
18CEL32	Engineering Geology Lab	2	0	3	5	50	50	100	2
18CEL33	Surveying Lab	0	0	3	3	50	50	100	1
	TOTAL	22	3	9	**34**	**450**	**450**	**900**	**20**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

Second Year B.Tech(SEMESTER – IV)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18CE401	Professional Practice, Law & Ethics	4	0	0	4	50	50	100	3
18CE402	Environmental Engineering	4	0	0	4	50	50	100	3
18CE403	Mechanics of Materials	3	1	0	4	50	50	100	3
18CE404	Hydraulics & Hydraulic Machines	3	1	0	4	50	50	100	3
18CE405	Concrete Technology	4	0	0	4	50	50	100	3
18EL002	Technical English	3	0	0	3	50	50	100	2
18CEII1	**Internship***	0	0	0	0	-	-	-	2
18CEL41	H & HM Lab	0	0	3	3	50	50	100	1
18CEL42	Environmental Engineering Lab	0	0	3	3	50	50	100	1
18CEL43	Materials Testing Laboratory	0	0	3	3	50	50	100	1
	TOTAL	21	2	9	32	450	450	900	22

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

*** Students will go to the Industry to identify the problem and survey the literature for a feasible solution. The work will be carried out during summer vacation after IV Semester.**

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

Third Year B.Tech(SEMESTER – V)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18CE501	Structural Analysis	4	1	0	5	50	50	100	4
18CE502	Remote Sensing & GIS	4	0	0	4	50	50	100	3
18CE503	Design of Concrete Structures	4	1	0	5	50	50	100	4
18CE504	Design of Steel Structures	4	1	0	5	50	50	100	4
18CE505	Water Resource Engineering	4	0	0	4	50	50	100	3
18CE506	Soil Mechanics	4	0	0	4	50	50	100	3
18CEM01	**Self Learning Elective Course)* (MOOCS)**	0	0	0	0	50	50	100	2
18CEL51	Geographical Information System Lab	0	0	3	3	50	50	100	1
18CEL52	Geo Technical Engineering Lab	0	0	3	3	50	50	100	1
	TOTAL	24	3	6	33	**450**	**450**	**900**	**25**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

- **Students can opt any one of the self-learning courses prescribed by the Department. Students register and complete the opted course in approved MOOCS platform on or before the Last Instruction Day of V semester. They have to submit the certificate before Last Instruction Day of VI semester**

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

Third Year B.Tech(SEMESTER – VI)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18CE601	Highway Engineering	4	0	0	4	50	50	100	3
18CE602	Irrigation Structures	4	0	0	4	50	50	100	3
18CE603	Foundation Engineering	4	0	0	4	50	50	100	3
18CED11…14	Elective-I	4	0	0	4	50	50	100	3
18CED21…24	Elective-II	4	0	0	4	50	50	100	3
18CED31…34	Elective-III	4	0	0	4	50	50	100	3
18CEL61	Advanced Surveying Laboratory	0	0	3	3	50	50	100	1
18CEL62	Computer Applications in Civil Engineering Laboratory - I	0	0	3	3	50	50	100	1
18CEL63	Transportation Engineering Laboratory	0	0	3	3				1
	TOTAL	24	0	9	33	450	450	**900**	**21**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

Final Year B.Tech(SEMESTER – VII)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18CE701	Engineering Economics & Management	4	0	0	4	50	50	100	3
18CE702	Estimation & Quantity Surveying	4	0	0	4	50	50	100	3
18CED41…44	Elective-IV	4	0	0	4	50	50	100	3
18—I--	Institution Elective-I	4	0	0	4	50	50	100	3
18CED51…54	Elective – V	4	0	0	4	50	50	100	3
18CEP01	Project-I	0	0	5	5				2
18CEL72	Computer Applications in Civil Engineering Laboratory - II	0	0	3	3	50	50	100	1
18CEL71	Soft Skills Lab	0	0	3	3	50	50	100	1
	TOTAL	20	0	11	31	**400**	**400**	**800**	**19**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

BAPATLA ENGINEERING COLLEGE : BAPATLA

(Autonomous)

SCHEME OF INSTRUCTION & EXAMINATION (Semester System)

For

Civil Engineering

Effective From the Academic Year2018-2019(R18 Regulations)

Final Year B.Tech(SEMESTER – VIII)

Code No.	Subject	Scheme of Instruction (Periods per week)				Scheme of Examination (Maximum marks)			No. of Credits
		L	T	P	Total	CIE	SEE	Total Marks	
18CE801	Construction Management	4	0	0	4	50	50	100	3
18—I--	Institution Elective-II	4	0	0	4	50	50	100	3
18CED61…64	Elective – VI	4	0	0	4	50	50	100	3
18CELP02	Project -II	0	0	24	24	75	75	150	10
18CEL81	Quantity Estimation & project Management Lab	0	0	3	3	50	50	100	1
	TOTAL	12	0	27	39	**250**	**250**	**550**	**20**

CIE: Continuous Internal Evaluation SEE: Semester End Examination

L: Lecture, T: Tutorial, P: Practical

Elective-I :

18CED11	**Advanced Structural Analysis**
18CED12	**Instrumentation and Sensor technology in Civil Engineering**
18CED13	**Sustainable Engineering & Technology**
18CED14	**Advanced Fluid Mechanics**

Elective-II:

18CED21	**Advanced Design of Structures**
18CED22	**Offshore Engineering**
18CED23	**Disaster preparedness and planning management**
18CED24	**Construction Engineering Materials**

Elective-III:

18CED31	**Pre stressed Concrete**
18CED32	**Environmental Geotechnics**
18CED33	**Low cost Housing Techniques**
18CED34	**Ground Improvement Techniques**

Elective-IV

18CED41	**Advanced Environmental Engineering**
18CED42	**Earthquake Resistant Design of Structures**
18CED43	**Water Resources Field Methods**
18CED44	**Repair & Rehabilitation of Structures**

Elective-V :

18CED51	**Transportation Systems Engineering**
18CED52	**Ground Water Development and Management**
18CED53	**Finite Element Analysis**
18CED54	**Solid and Hazardous Management**

Elective-IV :

18CED61	**Bridge Engineering**
18CED62	**Environmental Impact Assessment and Management**
18CED63	**Pavement Analysis and Design**
18CED64	**Town planning and Architecture**

Open Elective-I & II:

The students of CE will choose an Inter department Elective offered by other Departments.

Open Electives offered by Civil Engineering Department

Open Elective-I: 1) Air Pollution & Control 2) Sustainable Water and Sanitation

Open Elective-II: 1) Disaster Management 2) Remote sensing & GIS

Institutional Elective-I (in VII semester – position as 6th theory subject)

18CEI01: Air Pollution & Control
18CEI02: Sustainable Water and Sanitation
18CSI01: Java Programming
18CSI02: Database Management Systems
18ECI01: Consumer Electronics
18ECI02: Embedded Systems
18EEI01: Application of Wavelets to Engineering Problems
18EEI02: Industrial Electrical Systems
18EII01: Principles & Applications of MEMS
18EII02: Power System Instrumentation
18ITI01: Data Analytics
18ITI02: Cyber Security
18MEI01: Fluid Power and Control Systems
18MEI02: Project Management
18MAI01: Linear Algebra
18PHI01: Nano-Materials and Technology
18PHI02: Fiber Optic Communication
18HUI01: System Thinking
18ELI01: English for Competitive Examinations
18ELI02: Professional Communication

Institutional Elective-II (in VIII semester – position as 3rd theory subject)

18CEI03: Disaster Management
18CEI04: Remote sensing & GIS
18CSI03: Python Programming
18CSI04: Computer Networks
18ECI03: Artificial Neural Network
18ECI04: Internet of Things (IoT)
18EEI03: High Voltage Engineering
18EEI04: Energy Auditing and Conservation
18EII03: Robotics and Automation
18EII04: Advanced Computer Control Systems
18ITI03: Mobile Application Developments
18ITI04: Web Technology
18MEI03: Non-Conventional Energy Sources
18MEI04: Automobile Engineering
18MAI02: Graph Theory
18PHI03: Advanced Materials
18PHI04: Optical Electronics
18HUI02: Organizational Psychology
18HUI03: Telugu Modern Literature
18ELI03: English Through Media

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous

LINEAR ALGEBRA AND ODE
I B.Tech –I Semester (Code: 18MA001)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)			:	50

Prerequisites: None

Course Objectives:

CO1: To learn about solving a system of linear homogeneous and non-homogeneous equations, finding the inverse of a given square matrix and also its Eigen values and Eigen vectors.

CO2: Identify the type of a given differential equation and select and apply the appropriate analyticaltechnique for finding the solution of first order and higher order ordinary differential equations.

CO3: Create and analyze mathematical models using first and second order differential equations to solve application problems that arises in engineering.

CO4: To learn about solving linear Differential equations with constant coefficients with the given initial conditions using Laplace transform technique.

Course Outcomes: Students will be able to

CLO-1:Apply elementary row operations to find the rank of a matrix, to solve a system of linear equations and to find the inverse of a matrix.

CLO-2:Find the Eigen values and Eigen vectors of the given square matrix and also compute the higher powers of the given matrix.

CLO-3: Solve separable, linear, exact differential equations with and without initial conditions.

CLO-4:Distinguish between linear and non-linear differential equation.

CLO-5: Write the piecewise continuous functions in terms of unit step functions and hence find its Laplace transforms.

CLO-6:Solve linear differential equation with constant coefficients and unit step input functions using Laplace transforms technique.

SYLLABUS

UNIT - I

Linear Algebra: Rank of a Matrix; Elementary transformations of a matrix; Gauss-Jordan method of finding the inverse; Consistency of linear System of equations: Rouches theorem, System of linear Non-homogeneous equations, System of linear homogeneous equations; vectors; Eigen values; properties of Eigen values(without proofs); Cayley-Hamilton theorem (without proof).

[Sections: 2.7.1; 2.7.2; 2.7.6; 2.10.1; 2.10.2; 2.10.3; 2.12.1; 2.13.1; 2.14; 2.15.]

[12 Hours]

UNIT - II

Differential Equations of first order: Definitions; Formation of a Differential equation; Solution of a Differential equation; Equations of the first order and first degree; variables separable; Linear Equations; Bernoulli's equation; Exact Differential equations; Equations reducible to Exact equations: I.F found by inspection, I.F of a Homogeneous equation, In the equation M dx+ N dy=0.

Applications of a first order Differential equations: Newton's law of cooling; Rate of decay of Radio-active materials.

[Sections: 11.1; 11.3; 11.4; 11.5; 11.6; 11.9; 11.10; 11.11; 11.12.1; 11.12.2; 11.12.4; 12.6; 12.8]

[12 Hours]

UNIT – III

Linear Differential Equations: Definitions; Theorem; Operator D; Rules for finding the complementary function; Inverse operator; Rules for finding the Particular Integral; Working procedure to solve the equation; Method of Variation of Parameters; Applications of Linear Differential Equations: Oscillatory Electrical Circuits.

[Sections: 13.1; 13.2.1; 13.3; 13.4; 13.5; 13.6; 13.7;13.8.1;14.1;14.5]

[12 Hours]

UNIT – IV

Laplace Transforms: Definition; conditions for the existence; Transforms of elementary functions; properties of Laplace Transforms; Transforms of derivatives; Transforms of integrals; Multiplication by t^n; Division by t; Inverse transforms- Method of partial fractions; Other methods of finding inverse transforms; Convolution theorem(without proof); Application to differential equations: Solution of ODE with constant coefficients using Laplace transforms.

[Sections:21.2.1; 21.2.2; 21.3; 21.4; 21.7; 21.8; 21.9; 21.10; 21.12; 21.13; 21.14; 21.15.1]

[12 Hours]

TEXT BOOK:

B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCE BOOKS:

[1] ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

ADVANCED OPTICS AND MATERIAL TESTING
I B.Tech – I Semester (Code: 18PH002)
(Common for CE & MECH)

Lectures	4	Tutorial	1		Practical	0	Credits	4	
Continuous Internal Assessment			:	50	Semester End Examination (3Hours)			:	50

Course Objectives:

CO1: To circulate the knowledge about the advanced optics and know its Engineering applications.
CO2:Tofamilize the basis of quantum theory and to make students to solve the physical problems.
CO3: To classify solids and to have a basic idea about the structural determination of crystals.
CO4: To make aware of some of the analytical techniques for material testing.

Course Outcomes:
CLO1: Students ability to understand the principles in the production and application of lasers and their effective utilization in optical communications.
CLO2: Students demonstrate appropriate competence and working knowledge of laws of modern physics in understanding advanced technical engineering courses.
CLO3: Students demonstrate the ability to apply knowledge of band theory of solids and to make understand the concept of energy band gap and hole.
CLO4: Ability to understand the crystal geometrics and estimation of crystal structure by X-ray diffraction technique.
CLO5: Students ability to understand the principle in the production and applications of ultrasonics and extend it for material testing using various nuclear techniques.

UNIT I

ADVANCED OPTICS

Lasers: Interaction of radiation with matter. Einstein co-efficients, Properties of laser, Population inversion, LASER principle, pumping schemes-Three level and four level laser, Types of lasers: solid-state lasers (Ruby), gas lasers (He-Ne), Semiconductor lasers; applications of lasers in industry and medicine.

Fibre Optics: Importance of optical fibre, Structure and principle of optical fibre, acceptance angle and numerical aperture, Types of optical fibres based on modes and refractive index, V-number, losses associated with optical fibres, fibre optical communication, advantages of optical fibres

UNIT II

Quantum Mechanics: Dual nature of light, de-Brogli's concept of matter waves, Davisson-Germer electron diffraction experiment, Heisenberg Uncertainty principle and applications (non-existence of electron in a nucleus and finite width of spectral lines), one dimensional time-

independent and dependent Schrödinger wave equations, physical significance of wave function, applications of time-independent Schrödinger wave equation to particle in a box(one dimensional), tunneling, the scanning tunneling microscope.

UNIT III

Band theory of solids and Structure determination

Band theory of Solids: Failures of classical free electron theory, success and failures of quantum free electron theory, Bloch theorem statement, Kronig-Penny model (without derivation), effective mass of electron, concepts of energy band gap and hole.

Structure determination: Crystal lattices (Bravias), Crystal systems and structures, planes, Miller indices, Bragg's law, structural analysis of crystals using X-Ray powder diffraction method (XRD).

UNIT IV

Ultrasonics and Nuclear Techniques

Ultrasonics: Properties of ultrasonics, General applications of ultrasonics.

Applications of Ultrasonic Testing: Weld inspection, Material analysis, corrosion testing, concrete under water measurements, Ultrasonic testing in the foundry industry.

NDT: Production of Ultrasonic waves, Pulse echo technique, time of flight diffraction technique, A –scan presentation, B- scan presentation, C –scan presentation.

Nuclear Techniques: Nuclear radio isotopes, Applications of radio isotopes (medical and industry) Properties of α,β,γ-rays and radiographic testing (NDT).

TEXT BOOKS:

1. A Text Book of Engineering Physics, M.N.Avadhanulu& P. Kshirsagar, S.Chand& Co., (Edition – 2013).
2, Engineering physics by S.O.Pillai

REFERENCE BOOKS:

1. Engineering physics by R.K.Gour and S.L.Gupta. Dhanpatrai publications.
2. Engineering physics by M.R.Sreenivasan. New age international publications.
3. Engineering physics by Palaniswamy. Scitech publications.
4. Basic Engineering physics – Dr.P.srinivasaRao, Dr.K.Muralidhar, Himalaya publication
5. Applied physics - Dr.P.srinivasaRao, Dr.K.Muralidhar, Himalaya publication
6. Engineering physics by Dr. D.Thirupathi Naidu, M. Veeranjaneyulu.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

INTRODUCTION TO CIVIL ENGINEERING
I B.Tech – I Semester (Code: 18CE103)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3Hours)			:	50

Prerequisites: None

Course Objectives:

CO1: To provide a comprehensive overview of the component fields within civil engineering.

CO2: Expose students to current Civil Engineering projects and their societal implications.

CO3: Introduce students to professionalism through interaction with practicing professionals.

CO4: To give the students an illustration of the use and properties of various building materials and case studies of the construction materials.

CO5: To provide a sound foundation for the further study of measurement techniquesand building surveying case study.

Course Outcomes: Students will be able to

CLO-1: Importance of Civil Engineering in the infrastructural development of the society.

CLO-2: Illustrate the types, uses, and properties of various building materials.

CLO-3: Explain the method of construction of different components of the building.

CLO-4: To impart the knowledge of the basic principles of section of site for building and building materials and their applications.

CLO-5: To impart the knowledge on the case studies on surveying aspect.

UNIT I

History of Civil Engineering, Relevance of Civil Engineering in the overall infrastructural development of the country.Various domains of Civil Engineering and courses of Civil Engineering.Roles and responsibilities of Civil Engineer in the society, Responsibilities of civil engineer in the protection of environment and preservation of natural resources. Opportunities in Civil Engineering and Recent Trends in Civil Engineering

UNIT II

Types and classification of structures – buildings, towers, chimneys, bridges, dams, retaining walls, soil, water tanks, roads, railways, runways and pipelines (Brief description only). Definition and types of buildings as per National Building Code of India (brief description only).

UNIT III

National Building Code (NBC) - Salient features, Site selection for buildings. Civil Engineering Materials- properties - uses– bricks, stones, cement Aggregates: Fine and coarse aggregate – concrete –steel, roofing, flooring, plastering, Doors, Windows, Timber and Paints. Case studies on the materials employed for the aspect of construction.

UNIT IV

Surveying - Object and uses, Fundamental principles, Classification of surveying,Plans and maps, Scales, units of measure, Conventional symbols, measurement ofdistances angels levelling determination of areas. Case studies on surveying aspect.

Text Books:

1. Ramamrutham.S, Basic Civil Engineering, DhanapathiRai Publishing co.
2. Kandya.A.A., Elements of Civil Engineering.Charotar Publishing house.

Reference Books:

1. Rangwala S C and Ketki B Dalal, Building Construction, Charotar Publishing house.

McKay, W. B., and McKay, J. K., Building Construction Volumes 1 to 4, Person India Education Services.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

COMMUNICATIVE ENGLISH
I B.Tech – I Semester (Code: 18EL001)

Lectures	3	Tutorial	0	Practical	0	Credits	2
Continuous Internal Assessment	:	50	Semester End Examination (3Hours)			:	50

UNIT-I

1.1 **Vocabulary Development**: Word formation-Formation of Nouns, Verbs & Adjectives from Root words-Suffixes and Prefixes
1.2 **Essential Grammar:** Prepositions, Conjunctions, Articles
1.3 **Basic Writing Skills**: Punctuation in writing
1.4 **Writing Practices**: Mind Mapping, Paragraph writing (structure-Descriptive, Narrative, Expository & Persuasive)

UNIT-II

2.1 **Vocabulary Development**: Synonyms and Antonyms
2.2 **Essential Grammar**: Concord, Modal Verbs, Common Errors
2.3 **Basic Writing Skills**: Using Phrases and clauses
2.4 **Writing Practices**: Hint Development, Essay Writing

UNIT- III

3.1 **Vocabulary Development**: One word Substitutes
3.2 **Essential Grammar**: Tenses, Voices
3.3 **Basic Writing Skills**: Sentence structures (Simple, Complex, Compound)
3.4 **Writing Practices**: Note Making

UNIT- IV

4.1 **Vocabulary Development**: Words often confused
4.2 **Essential Grammar**: Reported speech, Common Errors
4.3 **Basic Writing Skills**: Coherence in Writing: Jumbled Sentences
4.4 **Writing Practices**: Paraphrasing &Summarising

Reference Books

- Communication Skills, Sanjay Kumar &PushpaLatha. Oxford University Press:2011.
- Practical English Usage, Michael Swan. Oxford University Press:1995.
- Remedial English Grammar, F.T.Wood. Macmillan:2007.
- Study Writing, Liz Hamplyons& Ben Heasley. Cambridge University Press:2006

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

BIOLOGY FOR ENGINEERS
I B.Tech – I Semester (Code: 18CE002)

Lectures	3	Tutorial	0	Practical	0	Credits	2
Continuous Internal Assessment	:	50	Semester End Examination (3Hours)			:	50

UNIT-I

Introduction to biology; Classification of microorganisms- Two kingdom, Three kingdom & Five kingdom; Prokaryotic cell structure (Bacteria); Eukaryotic cell structure (Plant & Animal cells); Differences between Prokaryotes and Eukaryotes.

UNIT-II

Bacterial Growth Phases; Nutrition in Bacteria; Types of media; Bacteria - Binary Fission, Endospore Formation; Plant & Animal cell Division - Mitosis & Meiosis.

UNIT-III

Structure of DNA (Watson & Crick model); Types of DNA & Function of DNA; Structure of RNA & types of RNA; Differences between DNA & RNA.Types of proteins & structure of proteins.

UNIT-IV

Sterilization methods - Physical methods : Heat, Filtration, radiation; Chemical methods: Phenolics, alcohols, aldehydes, halogens, heavy metals, sterilizing gases, dyes. Economic importance of bacteria (Harmful & Beneficial aspects); Plants in Primary Health care - Tulasi, piper longum, Myrobalan, Aloe vera, Turmeric.

REFERENCES:

1. Prof. K.yadagiri., Dr. M. Manikya Lakshmi, “Botany” paper-I,II,III,IV (Telugu Akademi Coordinating Committee)
2. Presscott, “Microbiology”
3. Pelczar, “Microbiology”
4. Ananthanarayana, “Microbiology”

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

PHYSICS LABORATORY
I B.Tech– I Semester (Code: 18PHL01)
(COMMON TO ALL BRANCHES)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment			50	Semester End Examination (3hours)			50

LIST OF EXPERIMENTS

1. Determination of acceleration due to gravity at a place using compound pendulum.
2. Study the variation of intensity of magnetic field along the axis of a circular coil using Stewart-Gee's appa□atus.
3. Determination of thickness of thin wire using air wedge interference bands.
4. Dete□□i□atio□ of □adius of □u□□atu□e of a Pla□o □o□□e□ le□s □□fo□□i□g Ne□to□'s □i□gs.
5. Determination of wavelengths of mercury spectrum using grating normal incidence method.
6. Determination of dispersive power of a given material of prism using prism minimum deviation method.
7. Draw the resonant characteristic curves of L.C.R. series circuit and calculate the resonant frequency.
8. Draw the characteristic curves of a photocell and calculate the maximum velocity of electron.
9. Verify the laws of transverse vibration of stretched string using sonometer.
10. Determine the rigidity modulus of the given material of the wire using Torsional pendulum.
11. Draw the load characteristic curves of a solar cell.
12. Determination of Hall coefficient of a semiconductor.
13. Determination of voltage and frequency of an A.C. signal using C.R.O.
14. Determination of Forbidden energy gap of Si &Ge.
15. Determination of wavelength of laser source using Diode laser.

Any three experiments are virtual

TEXT BOOK:

1. □Engineering physics laboratory manual□P.Srinivasarao&K.Muralidhar,Himalaya publications.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

COMMUNICATION LAB
I B.Tech– I Semester (Code: 18ELL01)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment			50	Semester End Examination (3hours)			50

UNIT-I

1.1 Listening Skills; Importance – Purpose- Process- Types
1.2 Barriers to Listening
1.3 Strategies for Effective Listening

UNIT-II

2.1 Phonetics; Introduction to Consonant, Vowel and Diphthong sounds
2.2 Stress
2.3 Rhythm
2.4 Intonation

UNIT-III

3.1 Formal and Informal Situations
3.2 Expressions used in different situations
3.3 Introducing Yourself & Others-Greeting & Parting-Congratulating-Giving Suggestions & Advices-Expressing Opinions-Inviting People-Requesting-Seeking Permission-Giving Information- Giving Directions- Sympathizing- Convincing People- Complaining & Apologizing-Thanking Others- Shopping- Travelling- Conversational Gambits

UNIT-IV

4.1 JAM Session
4.2 Debates
4.3 Extempore

Reference Books:

- Communication Skills, Sanjay Kumar and PushpaLata. Oxford University Press. 2011
- Better English Pronunciation, J.D. O' Connor. Cambridge University Press:1984
- New Interchange (4rth Edition), Jack C Richards. Cambridge University Press:2015
- English Conversation Practice, Grant Taylor. McGraw Hill:2001

Software:

- Buzzers for conversations, New Interchange series
- English in Mind series, Telephoning in English
- Speech Solutions, A Course in Listening and Speaking

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

COMPUTER PROGRAMMING LAB
(Civil Engineering)
I B.Tech – I Semester (Code: 18CSL01)

Lectures	2	Tutorial	0		Practical	3	Credits	2	
Continuous Internal Assessment			:	50	Semester End Lab Examination (3 Hours)			:	50

Prerequisites: Basic Mathematics

Course Objectives: To learn

CO1: Geometrical Approach to the mean value theorems and their application to the mathematical problems.

CO2: Concept of Sequence and Series

CO3: Evaluation of improper integrals using Beta and Gamma functions

CO4: Evaluation of multiple integrals and their applications

CO5: Basic properties of vector point function and their applications to line, surface and volume integrals

Course Outcomes: Students will be able to

CLO-1: Solve problems involving mean value theorems

CLO-2: Analyze the nature of convergence of sequence and series

CLO-3: Evaluate integrals using special functions and change of variables

CLO-4: Evaluate double and triple integrals

CLO-5: Transform line integral to surface and surface to volume integrals

UNIT – I

Overview of C, Constants, Variables and Data Types, Operators and Expressions, Managing I/O operations.

Programming Exercises for Unit I:C-expressions for algebraic expressions, evaluation of arithmetic and Boolean expressions. Syntactic errors in a given program, output of a given program, values of variables at the end of execution of a program fragment, filling the blanks in a given program. Programs using Scientific and Engineering formulae.Finding the largest of the three given numbers.Computation of discount amount on different types of products with different discount percentages. Finding the class of an input character, finding the type of triangle formed with the given sides, computation of income-tax, computation of electricity bill and conversion of lower case character to its upper case.

UNIT II

Decision Making and Branching, Decision Making and Looping

Programming Exercises for Unit II: To print the sum of the digits of a given number and to display the image of a given number. To find whether a given number is prime, printing Fibonacci sequence.

UNIT III

Data Structures: Arrays, Character Arrays and Strings

Programming Exercises for Unit III: Computation of statistical parameters of a given list of numbers. To find the length of a string, compare strings, reverse a string, copy a string and to find whether the given string is palindrome or not. Transpose of a matrix, product and sum of matrices and sorting of names using arrays. Sorting a list of names using character array.

UNIT IV

User-defined Functions

Programming Exercises for Unit - IV: Functions - Insertion sort, Linear search. Recursive functions to find factorial & GCD (Greatest Common Divisor)

TEXT BOOK:

1. Programming in ANSI C by E. Balaguruswamy, Seventh Edition. TMH

REFERENCE BOOKS:

1. Kernighan BW and Dennis Ritchie M, “C programming language”, 2nded, Prentice Hall.
2. Yashavant P. Kanetkar, “Let us C”, BPB Publications.
3. Herbert Schildt, “C: The Complete Reference”, 4th edition, Tata Mcgraw-Hill.
4. Ashok N.Kamthane, “Programming in C”, PEARSON 2nd Edition

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

NUMERICAL METHODS AND ADVANCED CALCULUS
I B.Tech –II Semester (Code: 18MA002)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives:

CO1: To learn about some advanced numerical techniques e.g. solving a nonlinear equation, linear system of equations, Interpolation and Approximation techniques.

CO2: To learn about evaluation of double and triple integrals and their applications.

CO3: To learn some basic properties of scalar and vector point functions and their applications to line,surface and volume integrals.

Course Outcomes: Students will be able to

CLO-1: Solve non-linear equations in one variable and system of linear equations using iteration methods.

CLO-2: Choose appropriate interpolation formulae based on the given data.

CLO-3: Compute the value of a definite integral using numerical integration techniques.

CLO-4: Predict the numerical solution of the derivative at a point from the given initial value problem using appropriate numerical method.

CLO-4 :Evaluate the double and triple integrals using change of variables.

CLO-5: Transformline integrals to surface and surface to volume integrals and evaluate them.

SYLLABUS

UNIT - I

Numerical Solution of Equations: Introduction; Solution of algebraic and transcendental equations: Bisection method, Method of false position, Newton-Raphson method; Useful deductions from the Newton-Raphson formula; Solution of linear simultaneous equations; Direct methods of solution: Gauss elimination method, Gauss-Jordan method, Factorization method; Iterative methods of solution: Jacobi's iterative method, Gauss-Seidel iterative method.

[Sections: 28.1; 28.2; 28.3; 28.5; 28.6; 28.7.1;28.7.2]. [12 Hours]

UNIT - II

Finite differences and Interpolation: Finite differences: Forward differences, Backward differences; Newton's interpolation formulae: Newton's forward interpolation formula, Newton's backward interpolation formula; Interpolation with unequal intervals; Lagrange's interpolation formula; Divided differences; Newton's divided difference formula; Numerical integration; Trapezoidal rule; Simpson's one-third rule; Simpson's three-eighth rule; Numerical solution of ODE's: Introduction; Picard's method; Euler's method; Runge-Kutta method.

[Sections:29.1; 29.1-1; 29.1.2; 29.6; 29.9; 29.10; 29.11; 29.12; 30.4; 30.6; 30.7; 30.8; 32.1; 32.2; 32.4; 32.7]. [12 Hours]

UNIT – III

Multiple Integrals: Double integrals; Change of order of integration; Double integrals in polar coordinates; Area enclosed by plane curves; Triple integrals; Volumes of solids: Volume as Triple integrals, Change of variables.

[Sections: 7.1; 7.2; 7.3; 7.4; 7.5; 7.6.2; 7.7.2]. [12 Hours]

UNIT – IV

Vector calculus and its Applications: Scalar and vector point functions; Del applied to scalar point functions-Gradient: Definition, Directional derivative; Del applied to vector point functions: Divergence, Curl; Line integral; Surfaces: Surface integral, Flux across a surface; Green's theorem in the plane (without proof); Stokes theorem (without proof); Gauss divergence theorem(without proof).

[Sections: 8.4; 8.5.1; 8.5.3; 8.6; 8.11; 8.12; 8.13; 8.14; 8.16] [12 Hours]

TEXT BOOK:

B.S.Grewal, "Higher Engineering Mathematics", 44thedition, Khanna publishers, 2017.

REFERENCE BOOKS:

[1] ErwinKreyszig, "Advanced Engineering Mathematics", 9th edition, John Wiley & Sons.
[2] N.P.Bali and M.Goyal, "A Text book of Engineering Mathematics" Laxmi Publications, 2010.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

ENGINEERING CHEMISTRY
(Common to all branches)
I B.Tech – II Semester (Code: 18CY001)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

COURSE OBJECTIVES: The student should be conversant:

CO1: With the principles of water characterization and treatment of water for industrial purposes and methods of producing water for potable purposes.
CO2: To understand the thermodynamic concepts, energy changes, concept of corrosion & its control.
CO3: With the conventional energy sources, solid, liquid and gaseous Fuels & knowledge of knocking and anti-knocking characteristics.
CO4: With aim to gain good knowledge of organic reactions, plastics, conducting polymers & biodegradable polymers.

COURSE OUTCOME:

After studying this course, students will be able to:

CLO-1: Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
CLO-2: Apply their knowledge in converting various energies of different systems and protection of different metals from corrosion.
CLO-3: Have the capacity of applying energy sources efficiently and economically for various needs.
CLO-4: Design economically and new methods of organic synthesis andsubstitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution.

UNIT I:
Water Chemistry **15 hrs**
Introduction: water quality parameters
Characteristics: Alkalinity, Hardness - Estimation & simple neumerical problems,
Boiler Troubles - Sludges, Scales, Caustic embrittlement, boiler corrosion, Priming and foaming;
Internal conditioning- phosphate, calgon and carbonate methods.
External conditioning - Ion exchange process & Zeolite proess

WHO Guidelines, Potable water, Sedimentation, Coagulation, Filtration. Disinfection methods: Chlorination, ozonization and UV treatment.
Salinity – Treatment of Brackish water by Reverse Osmosis and Electrodialysis.

UNIT II **15 hrs**

Thermodynamic functions: energy, entropy and free energy. Estimations of entropy and free energies.Free energy and emf.Cell potentials, the Nernst equation and applications.

Corrosion: Types of corrosion - Chemical or dry corrosion, Electrochemical or wet corrosion; Galvanic, stress, pitting and differential aeration corrosion; Factors effecting corrosion, **Corrosion control** – Cathodic protection, and electro plating (Au)&electoless Ni plating.

UNIT III: Fuels **15 hrs**

Classification of fuels; Calorific value of fuels (lower, higher)
Solid fuels: Determination of calorific value (Bomb Calorimeter) & related problems, Coal ranking,
Liquid Fuels: Petroleum refining and fractions, composition and uses. Knocking and anti-knocking Agents, Octane number and Cetane number; Bio fuels- Biodiesel, general methods of preparation and advantages
Gaseous fuels: CNG and LPG,
Flue gas analysis – Orsat apparatus.

UNIT IV: **15 hrs**

Organic reactions and synthesis of a drug molecule
Introduction to reactions involving substitution (SN^1, SN^2), addition (Markownikoff's and anti-Markwnikoff's rules) , elimination (E_1& E_2), Synthesis of a commonly used drug molecule.(Aspirin and Paracetamol)
Polymers: Conducting polymers: Classification, Intrinsic and Extrinsic conducting polymers and their applications**.** Plastics: Thermoplasts and thermosetting plastics, Bskelite and PVC.
Bio degradable polymers: types, examples-Polyhydroxybuterate (PHB), Polyhydroxybuterate-co-β-hydroxyvalerate (PHBV), applications.

TEXT BOOKS:

1. P.C. Jain and Monica Jain, "Engineering Chemistry" DhanpatRai Pub, Co., New Delhi 17^{th} edition (2017).
2. SeshiChawla, "Engineering Chemistry"DhanpatRai Pub, Co LTD, New Delhi 13 th edition, 2013.

REFERENCES:

1 Essential Of Physical Chemistry by ArunBahl, B.S. Bahl, G.D.Tuli, by ArunBahl, B.S. Bahl, G.D.Tuli, Published by S Chand Publishers, 12th Edition, 2012.

2 Text Book of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad (2006).

3 Engineering Chemistry by K. Maheswaramma, Pearson publishers 2015.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

ENGINEERING MECHANICS
(CIVIL ENGINEERING)
I B.Tech – II Semester (Code: 18CE203)

Lectures	4	Tutorial	1	Practical	0	Credits	4
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)			:	50

Prerequisites: PHYSICS

Course Objectives: To learn

CO1: The concepts Force systems, free body diagrams, resultant of forces and equations of equilibrium, Supports and support reaction sand calculation of Centroid

CO2: The Concept of moment of inertia of plane figures, Laws and applications of friction

CO3: The Analysis of the truss and determination of axial forces by Method of Joints

CO4:Motion of a body and their relationships and application of D Alembert's principle in rectilinear and curvilinear motions

CO5:AboutMass moment of inertia of material bodies, Plane motion of a body about a fixed axis

Course Outcomes: Students will be able to

CLO-1:Construct free body diagrams and use appropriate equilibrium equations, Calculate unknown forces in a plane by resolution of force and equilibrium equations

CLO-2: Locate Centroid of composite figures and determine moment of plane figures

CLO -3: Analyze the systems with friction

CLO-4: Determine the axial forces in the members of determinate truss. Calculation of acceleration, velocity and displacement and forces

CLO-5: Determine moment of inertia of material bodies, Calculation of angular displacement, velocity and angular acceleration of rotational bodies.

UNIT – I

Concurrent Forces in a Plane

Principles of statics – composition and resolution of forces – equilibrium of concurrent forces in a plane –Method of moments.

Parallel Forces in a Plane

Two parallel forces – general case of parallel forces in a plane – center of parallel forces – Centroids of composite plane figures and curves-

UNIT – II

Moments of Inertia of Plane Figures

Moment of inertia of a plane figure with respect to an axis in its plane – Moment of Inertia with respect to an axis perpendicular to the plane of the figure – Parallel axis theorem.

Friction

Characteristics of friction – problems involving dry friction, ladder friction and wedge friction.

UNIT – III

Analysis of Plane Trusses

Trusses types – Axial forces finding in the members using method of joints.

Kinematics and Kinetics of a particle

Kinematics of rectilinear motion – principles of dynamics – Differential equations of rectilinear motion, D'Alemberts principle -Kinematics of curvilinear motion – Differential equations of curvilinear motion – D'Alembert's principle.

UNIT – IV

Moments of Inertia of Material Bodies

Moment of inertia of a rigid body – Moment of inertia of a lamina – Moments of inertia of three – dimensional bodies.

Rotation of a Rigid Body about a Fixed Axis

Kinematics of rotation – Equation of motion for a rigid body rotating about a fixed axis – D'Alembert's principle.

NOTE

Two questions of 10 marks each will be given from each unit out of which one is to be answered. Ten questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXT BOOK

1. Engineering mechanics by S. Timoshenko and D. H. Young – McGraw-Hill International edition (For concepts and symbolic problems)
2. Engineering mechanics statics and dynamics by R. C. Hibbeler and Ashok Gupta - Pearson (For numerical problems using S.I. system of units)

REFERENCE BOOKS

1. Vector mechanics for engineers statics and dynamics by Beer and Johnston, Tata McGraw-Hill publishing company, New Delhi

2.Engineering mechanics statics and dynamics by A. K. Tayal – Umesh publication, Delhi (For numerical problems using S.I. system of units

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

ENVIRONMENTAL STUDIES
I B.Tech – II Semester (Code: 14CE001)

Lectures	3	Tutorial	0	Practical	0	Credits	2
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives: To learn

CO1: To develop an awareness,knowledge, and appreciation for the naturalenvironment.

CO2: To understand different types of ecosystems exist in nature.

CO3: To know our biodiversity.

CO4: To understand different types of pollutants present in Environment.

CO5: To know the global environmental problems.

Course Outcomes: Students will be able to

CLO 1: Develop an appreciation for the local and natural history of the area.

CLO 2: Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of people's movements focusing on environment.

CLO 3: Know how to manage the harmful pollutants.

CLO 4: Gain the knowledge of Environment.

CLO 5: Create awareness among the youth on environmental concerns important in the long-term interest of the society

UNIT – I

Introduction: Definition, Scope and Importance, Need for public awareness. Ecosystems: Definition, Structure and Functions of Ecosystems, types - Forest, Grassland, Desert, Aquatic (Marine, pond and estuaries). *6 periods*

Biodiversity: Definition and levels of Biodiversity; Values of Biodiversity - Consumptive, Productive, Social, Aesthetic, Ethical and Optional; Threats and Conservation of Biodiversity; Hot Spots of Biodiversity, Bio-geographical Classification of India, India as a mega diversity nation. *Chipko movement case study* *6 periods*

UNIT – II

Natural resources: Land: Land as a resource, Causes and effects of land degradation - Soil erosion, Desertification. **Forest**: Use of forests, Causes and effects of deforestation, Afforestation, Mining - benefits and problems. **Water**: Uses, floods and drought, Dams - benefits and problems.

Energy: Importance of energy, Environmental Impacts of Renewable and Non-renewable energy resources. *Silent Valley Project and Narmada BachaoAndolan case studies8 periods*

Sustainability: Definition, Concept and Equitable use of resources for sustainable development; Rain water harvesting and Watershed management. Fieldwork on Rain water harvesting and Watershed management. *6 periods + 6 hours field work/Demonstration*

UNIT – III

Pollution: Definition; Causes, effects and control of air, water and nuclear pollution; *Chernobyl Nuclear Disaster* case study; Solid Waste: urban, Industrial and hazardous wastes; Integrated waste management - 3R approach, composting and vermicomposting. *12 periods*

Environmental acts: Water and air (Prevention and Control of pollution) acts, Environmental protection act, Forest Conservation act. *6 periods*

UNIT – IV

Environmental issues: Green house effect & Global warming, Ozone layer depletion, Acid rains, Green Revolution, Population Growth and environmental quality, Environmental Impact Assessment. Environmental Standards (ISO 14000, etc.) *12 periods*
Case Studies: Bhopal Tragedy, Mathura Refinery and Taj Mahal, and Ralegan Siddhi (Anna Hazare). *6 periods*

Field work: Visit to a local area to document environmental assets – Pond/Forest/Grassland. Visit to a local polluted site- Urban and industry/ Rural and Agriculture. *6 hrs.*

TEXT BOOKS:

1. "Environmental Studies" by Benny Joseph, Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. "Comprehensive environmental studies"- JP Sharma, Laxmi Publications.
3. Text Book of environmental Studies – ErachBharucha

REFERENCE BOOKS:

1. "Environmental studies", R.Rajagopalan, Oxford University Press.
2. "Introduction to Environmental Science", Anjaneyulu Y, B S Publications
3. "Environmental Science", 11th Edition – Thomson Series – By Jr. G. Tyler Miller.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
(Autonomous)

ELECTRICAL TECHNOLOGY & MECHANICAL TECHNOLOGY
I B.Tech – II Semester (Code: 18CE205)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Part- A: ELECTRICAL TECHNOLOGY

UNIT – I

Electrical circuit elements (R, L and C), Definitions of voltage and current, Power & Energy, Kirchhoff current and voltage laws, Direct Current; Alternating Current; Comparison between Half wave & Full wave Rectifiers, Advantages of Alternating Current. Have wave and Full wave Rectifiers.

ELECTRICAL MACHINES: Constructional details, Working Principle & Applications of DC Generators & Motors. Constructional details, working & Applications of Transformers.

UNIT – II

ELECTRICAL MACHINES (Contd.): Constructional details, Working Principle & Applications of Alternators, Three phase and single phase Induction Motors.

TRANSMISSION LINES: Necessity of Transmission Lines, Types of Towers; sad and stress in overhead conductors at level supports; sag span curves, effect of wing on sag.

Part- B: MECHANICAL TECHNOLOGY

UNIT – I

TRANSMISSION OF POWER: Belt drives: Velocity ratio, Slip, Ratio of tensions, Power transmitted, Creep.

PRINCIPLES OF MANUFACTURING PROCESSES: Casting, Rolling, Drawing, Turning, Drilling, Milling, Welding & Soldering.

UNIT – II

Thermal Prime movers: Principle and operation of I.C Engines, Working of 2-S, 4-S, S.I and C.I engines, comparison of S.I & C.I, 2-S & 4-S engines, Brief introduction to civil construction equipment.

Compressors: Operation and application of single stage and multistage reciprocating air compressors.

TEXT BOOK : Engineering Basics by T.Thyagarajan, K.P. SendurChelvi and T.R. Rangaswamy, New Age International Ltd.
TEXT BOOK : Elements of Mechanical Engineering by Mathur, Mehta&Tewari, Jain Brothers, New Delhi.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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ENGINEERING GRAPHICS
I B.Tech – I Semester (Code: 18MEL01)

Lectures	1	Tutorial	0	Practical	4	Credits	4
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives: To learn

CO1: clear picture about the importance of engineering graphics in the field of engineering

CO2: the drawing skills and impart students to follow Bureau of Indian Standards

CO3: To give an idea about Geometric constructions, Engineering curves, orthographic projections and pictorial projections

CO4: imagination skills about orientation of points, lines, surfaces and solids

CO5: basic drafting skills of AutoCAD

Course Outcomes: Students will be able to

CLO-1: draw projections of points and projections of lines using Auto CAD

CLO-2: plot projections of surfaces like circle, square and rhombus

CLO-3: plot the Projections of solids like Prisms and pyramids

CLO-4: convert the of Orthographic views into isometric views of simple objects

CLO-5: generate the of pictorial views into orthographic views of simple castings

UNIT – I

INTRODUCTION: Introduction to Drawing instruments and their uses, geometrical construction procedures

INTRODUCTION TO AUTOCAD:

Basics of sheet selection, Draw tools, Modify tools, dimensioning

METHOD OF PROJECTIONS: Principles of projection - First angle and third angle projectionof points. Projection of straight lines.Traces of lines.

UNIT II

PROJECTIONS OF PLANES: Projections of plane figures: circle, square, rhombus, rectangle, triangle, pentagon and hexagon.

UNIT – III

PROJECTIONS OF SOLIDS: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones Inclined to one plane. .

UNIT –IV

ISOMETRIC PROJECTIONS: Isometric Projection and conversion of Orthographic views into isometric views. (Treatment is limited to simple objects only).

UNIT –V

ORTHOGRAPHIC PROJECTIONS: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

TEXT BOOK:

1. Engineering Drawing with AutoCAD by Dhananjay M. Kulkarni (PHI publication)
2. Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand). (First angle projection)

REFERENCE BOOKS:

1. Engineering Drawing by Dhananjay A Jolhe, Tata McGraw hill publishers
2. Engineering Drawing by Prof.K.L.Narayana& Prof. R.K.Kannaiah.

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CHEMISTRY LABORATORY
(Common to all branches)
I B.Tech – II Semester (Code: 18CYL01)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

LIST OF EXPERIMENTS

1. **Introduction to Chemistry Lab** (the teachers are expected to teach fundamentals likeCalibration of Volumetric Apparatus, Primary, Secondary Solutions, Normality, Molarity, Molality etc. anderror, accuracy, precision, theory of indicators, use of volumetric titrations).

2. **Volumetric Analysis:**
   a. Estimation of Washing Soda.
   b. Estimation of Active Chlorine Content in Bleaching Powder
   c. Estimation of Mohr's salt by permanganometry.
   d. Estimation of given salt by using Ion-exchange resin using Dowex-50.
3. **Analysis of Water:**
   a. Determination of Alkalinity of Tap water.
   b. Determination of Total Hardness of ground water sample by EDTA method
   c. Determination of Salinity of water sample
4. **Estimation of properties of oil**:
   a. Estimation of Acid Value
   b. Estimation of Saponification value
5. **Preparations:**
   a. Preparation of Soap
   b. Preparation of Urea-formaldehyde resin
   c. Preparation of Phenyl benzoate
6. **Demonstration Experiments (Any two of the following):**
   a. Determination of $p^H$of given sample.
   b. Determination of conductivity of given sample by conductometer.
   c. Potentiometric Determination of Iron.

TEXT BOOKS (for Chemistry 1 and 2):

1. Practical Engineering Chemistry by K.Mukkanti, Etal, B.S. Publicaitons, Hyderabad, 2009.
2. Inorganic quantitative analysis, Vogel, 5^{th} edition, Longman group Ltd. London, 1979.

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R.n. Goyal and HarrmendraGoel.
2. A text book on experiments and calculations- Engineering Chemistry. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

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WORK SHOP
I B.Tech – II Semester (Code: 18MEL02)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)	:	50		

Prerequisites: None

Course Objectives:

1. To impart student knowledge on various hand tools for usage in engineering applications.
2. Be able to use analytical skills for the production of components.
3. Design and model different prototypes using carpentry, sheet metal and welding.
4. Make electrical connections for daily applications.
5. To make student aware of safety rules in working environments.

Course Outcomes: After completion of this course student should be able to:

1. Make half lap joint, Dovetail joint and Mortise &Tenon joint
2. Produce Lap joint, Tee joint and Butt joint using Gas welding
3. Prepare trapezoidal tray, Funnel and T-joint using sheet metal tools
4. Make connections for controlling one lamp by a single switch, controlling two lamps by a single switch and stair case wiring.

Syllabus:

1. Carpentry
   a. Half Lap joint
   b. Dovetail joint
   c. Mortise &Tenon joint
2. Welding using electric arc welding process/gas welding
   a. Lap joint
   b. Tee joint
   c. Butt joint
3. Sheet metal operations with hand tools
   a. Trapezoidal tray
   b. Funnel
   c. T-joint
4. House wiring
   a. To control one lamp by a single switch
   b. To control two lamps by a single switch
   c. Stair-case wiring

TEXT BOOKS:

1. P.Kannaiah and K.L.Narayana, Workshop Manual, SciTech Publishers, 2009.
2. K. Venkata Reddy, Workshop Practice Manual, BS Publications, 2008.

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PROBABILITY AND STATISTICS
II B.Tech – I Semester (Code: 18MA003)

Lectures	4	Tutorial	0		Practical	0	Credits	3
Continuous Internal Assessment			:	50	Semester End Examination (3 Hours)			50

UNIT- I

Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, Uniform Distribution, Gamma Distribution and its applications, Beta Distribution and its applications, Joint Distributions (Discrete),Joint Distributions (Continuous).Populations and Samples, Law of large numbers, Central limit theorem and its applications, The sampling distribution of the mean (σ unknown),The sampling distribution of the variance.
(Sections 5.1, 5.2, 5.3, 5.5,5.7, 5.8, 5.10, 6.1, 6.2, 6.3, 6.4 of Text Book [1])

UNIT – II

Point estimation, Interval estimation, Tests of Hypotheses, Null Hypothesis and Tests of hypotheses, Hypothesis concerning one mean, Comparisons-Two independent Large samples, Comparisons-Two independent small samples, Paired sample t test.
(Sections 7.1,7.2, 7.4, 7.5, 7.6, 8.2, 8.3, 8.4 of Text Book [1])

UNIT-III

The estimation of variances, Hypotheses concerning one variance, Hypotheses concerning two variances, Estimation of proportions, Hypotheses concerning one proportion, Hypotheses concerning several proportions, Procedure for Analysis of Variance (ANOVA) for comparing the means of k (>2) groups- one way classification(Completely randomized designs), Procedure for Analysis of Variance (ANOVA) for comparing the means of k (>2) groups- two way classification(Randomized block designs).
(Sections 9.1, 9.2, 9.3, 10.1, 10.2, 10.3, 12.2, 12.3 of Text Book [1])

UNIT –IV

Multivariate Analysis: The concept of bivariate relationship, scatter diagram, Pearson's correlation and correlation matrix. Simple linear regression model and assumptions, Least Squares Estimation of the parameters of the model, Testing the significance of the model. Regression versus Correlation, Multiple linear regression model with k explanatory variables and assumptions of the model. Least Square Estimation of regression coefficients. Concept of the coefficient of determination R^2. Test for significance of the regression model and individual regression coefficients. Applications of multiple regression analysis.
(1^{st} and 2^{nd} Chapters of Text Book [2]).

TEXT BOOKS:

1. Miller & Freund's "Probability and Statistics for Engineers", Richard A. Johnson, 8th Edition, PHI.
2. Introduction to Linear Regression Analysis, Douglas C. Montgomery, E.A. Peck and G.G. Vining, 3rdedition, Wile

REFERENCE BOOKS :

1. R.E Walpole, R.H. Myers & S.L. Myers 'Probability & Statistics for Engineers and Scientists', 6th Edition, PHI.
2. Fundamentals of Mathematical Statistics, S.C.Gupta and V.K.Kapoor,11th Edition, Sultan Chand & Sons.
3. Murray R Spiegel, John J.Schiller, R. AluSrinivasa, 'Probability &Satistics', Schaum's outline series.
4. K.V.S.Sarma,'Statistics Made Simple – Do it yourself on PC',Prentice Hall India, Second Edition, 2015.

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SURVEYING
II B.Tech – I Semester (Code: 18CE302)

Lectures	4	Tutorial	1		Practical	0	Credits	4
Continuous Internal Assessment			:	50	Semester End Examination (3 Hours)			50

Course Objectives:

- To study the basics of linear/angular measurement methods like chain surveying, compass surveying.
- To study the basics of leveling and theodolite survey in elevation and angular measurements.
- To determine the relative positions of the existing features on the ground.
- To deal with various methods employed for the measurement of areas and volumes.
- To study different methods of setting & design of simple circular curves.
- To introduce about EDM, Digital theodolite and total station.

Course Outcomes:

At the end of course student will able to:

- To determine the relative positions of a point on the existing ground by conducting the survey.
- To take the levels of existing ground and to determine the reduced levels.
- To minimize the errors while taking measurements.
- To gain knowledge about computation of areas, volumes and methods of traversing
- To know about the latest Surveying Instruments.
- To design and layout curves for a roads and railways.

UNIT –I

Chain survey-Terminology-Ranging-methods, Chain & tape corrections-problems, obstacles in chaining Errors in surveying- Types & sources of errors. Compass survey-Bearings-Types of compass-F.B-B.B-Local attraction-Problems on local attraction, Declination.

UNIT –II

Theodolite traverse- Types of traverse- Checks in closed & open traverse- Latitude and Departures-Error of closure-Problems on omitted measurements.

Levelling-Classification of levelling-Terminology-Types of levels-booking and reducing levels & Probelems.
Contouring: Methods-Characteristics, uses;

UNIT –III

Areas & Volumes- Area of tract with straight & irregular boundaries by various formulae- Volume of level & two level sections- Problems.
Triangulation –classification- Baseline – site selection for base line- Classification of Signals. Satellite station - reduction to Centre.

UNIT –IV

Setting out curves: Types, elements of simple circular, Compound & Reverse curves.
Principle of Electronic Distance Measurement, Types of EDM instruments, Total Station – Parts of a Total Station – Accessories –Advantages and Applications, Field Procedure for total station survey,

TEXT BOOKS:

1. Arora, K.R. I, Surveying, Vol-I, II and II, Standard Book House, 2015.
2. Surveying Vol. I&II by B.C. Punmia ,Laxmi Publications,2005

REFERENCES:

1. Chandra A.M., Higher Surveying, Third Edition, New Age International (P) Limited, 2002.
2. C. Venkatramaiah, Text Book of Surveying, Universities Press Pvt Ltd, Hyderabad. Revised Edition 2011.
3. Madhu N., Sathikumar, R. and Satheesh Gobi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson India, 2006.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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SOLID MECHANICS
II B.Tech – I Semester (Code : 18CE303)

Lectures	3	Tutorial	1	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)				50

Course objectives:
The objective of this Course is:
1. to explain fundamental concepts such as stress, strain, elastic constants, compatibility, thermal stresses etc.
2. to understand the stresses and strains in thin cylinders and spherical shells.
3. to draw the shear force and bending moment diagrams for beams.
4. to understand simple bending theory, flexural stresses and shear stresses.
5. to understand torsion and stresses developed by torsion on circular shafts and application of strain energy principles on springs.

Student Learning Outcomes:
On completion of the course the student will be able to:
1. analyse solids subjected to forces both direct and indirect, and understand their behavior by interpreting stress, strain, elastic constants etc.
2. analyse and design thin walled pressure vessels.
3. draw shear force and bending moment diagrams for beams subjected to different forces.
4. apply simple bending theory to analyse and design beams of various sections and apply shear stress formula for members subjected to flexure.
5. apply torsion formula to analyse and design circular shafts and springs

UNIT-I

1. SIMPLE STRESS AND STRAIN

Elasticity and plasticity - Types of stresses & strains - Hooke's law - stress - strain diagram for mild steel –Allowable stress-Factory of safety - Normal strain, Poisson's ratio & volumetric strain - Elastic moduli & the relationship between them - Bars of varying section – composite bars - Temperature stresses

2. THIN WALLED PRESSURE VESSELS

Thin cylinders - circumferential and longitudinal stresses and strains - Spherical pressure vessels.

UNIT-II

3. INTERNAL FORCES IN BEAMS

Introduction – Diagrammatic conventions for supports and loads – Calculation of beam reactions – Application of method of sections – Shear force in beams – Bending moment in beams – Shear force and bending moment diagrams

UNIT-III

4. BENDING STRESSES IN BEAMS

Introduction – Basic assumptions – the elastic flexure formula – application of flexure formula

5. SHEAR STRESSES IN BEAMS

Introduction – Shear flow –The shear stress formula for beams – Shear stress in beam flanges- Shear center

UNIT-IV

6. TORSION

Introduction - Application of the method of sections - Torsion of circular elastic bars - Basic assumptions - the torsion formula - Design of circular bars in torsion for strength - Angle of twist of circular bars –strain energy due to torsion

7.STRAIN ENERGY

Introduction-Elastic strain energy for uni-axial stress- Strain energy of beams in shear-Strain energy for multi-axial state of stress.

8. SPRINGS

Types of springs - stresses in closely coiled helical springs-Deflection of closely coiled helical springs.

TEXT BOOKS:

1. Engineering mechanics of solids by E.P.Popov, Prentice Hall of India, 2005.
2. Strength of Materials by R. Subramanian., Oxford University Press, Third Edition, 2016.

REFERENCES:

1. Elements of strength of materials by S.P.Timoshenko and D.H.Young, Affiliated East-West Press Pvt.Ltd., 2005.
2. Strength of materials by S. S. Bhavikatti, Vikas Publishing House Pvt. Ltd., 1998.
3. Strength of materials by S. Ramamrutham, Dhanpat Rai Publishing Company Pvt. Ltd., 2011

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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BUILDING MATERIALS, PLANNING AND CONSTRUCTION
II B.Tech – I Semester (Code : 18CE304)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)				50

UNIT – I

1. Stones
Qualities of a good building stone, Common building stones of India.

2. Bricks
General; Composition of good brick earth; Harmful ingredients in brick earth; Manufacture of bricks by clamp burning and kiln (only Hoffman's kiln) burning, Qualities of good bricks; Tests for bricks; Classification of bricks; Size and weight of bricks

3. Lime
General; Some definitions; Sources of lime; Constituents of limestones; Classification of limes; Properties of fat lime and hydraulic lime;

4. Timber
Definition; Structure of a tree; Qualities of good timber; Decay of timber; Preservation of timber; Advantages of timber construction; Uses of timber;

UNIT –II

5. Stone & Brick Masonry
Technical terms; Types of bonds in brickwork and their suitability. Classification of stone masonry

6. Walls
Classification of walls.

7. Floors
Technical terms; Types of ground floors

8. Roofs
Technical terms; Classification of roofs; Steel sloping roofs; Roof covering materials; Types of flat roofs;

UNIT –III

9. Staircases
Technical terms; Types of stair-cases, design considerations.

10. Dampness And Damp Proofing
Causes of dampness; Methods of preventing dampness; Damp proofing materials and their classification; Methods of providing DPC under different situations.

11. Scaffolding, Shoring, Under Pinning And Form Work
Types of scaffolding; Types of formwork; Centering.

UNIT –IV

12. An Approach To Planning
Site planning; Space requirement–Establishing areas for different units, Furniture requirements, Roominess, Flexibility, Sanitation, Lighting, Ventilation, Space for equipment for air–conditioning, Space for machinery etc.; Flow diagram and line plan–Grouping, Circulation, Orientation, Aspect and prospect, Privacy, Elegance and economy; Climatic considerations; Architectural composition–Unity, Mass composition, Contrast, Proportion, Scale, Accentuation and rhythm.

13. Building Rules And Bye–Laws
Zoning regulations; Regulations regarding layouts or sub-divisions; Building regulations; Rules for special type of buildings; Calculation of plinth, floor and carpet area; Floor space index.

15. Building Elements
Conventional signs; Guidelines for staircase planning; Guidelines for selecting doors and windows; Terms used in the construction of door and window.

TEXT BOOKS
1. Engineering Materials by S. C. Rangwala; Charotar Publishing House, Anad.
2. Building construction by B. C. Punmia et all; Laxmi Publications, New Delhi.
3. Planning and Designing Buildings by Yashwant S. Sane, Allies Book Stall.

REFERENCE
1. Building Drawing by M.G. Shah, C.M. Kale and S.Y. Patki, Tata McGrqw-Hill, New Delhi.

2. Building Materials by SK Duggal

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FLUID MECHANICS
II B.Tech – I Semester (Code : 18CE305)

Lectures	3	Tutorial	1	Practical	0	Credits	3
Continuous Internal Assessment	:	50	Semester End Examination (3 Hours)				50

Prerequisites: None

Course Objectives:

CO1: To familiarize with the properties of fluids and the applications of fluid mechanics

CO2: To formulate and analyze problems related to calculation of forces in fluid structure interaction.

CO3: Ability to understand types of flows and analyze fluid flow problems with the application of the energy equation.

CO4: To understand the concept of fluid measurement and Boundary Layer.

CO5: To determine the losses in a flow system and flow through pipes.

Course Outcomes: Students will be able to

CLO-1: Get knowledge of basic principles of fluid mechanics

CLO-2: Understand about hydrostatic law, principle of buoyancy and stability of a floating body.

CLO-3: Analyze fluid flow problems with the application of the energy equation.

CLO-4: Know the concept of fluid measurement and aware of the concepts related to boundary layer theory.

CLO-5: Analyze and design simple pipe systems.

UNIT I

Properties of Fluids: Specific gravity, viscosity, surface tension and Capillarity.

Fluid Statics: Introduction, pressure, Pascal's law, hydrostatic law, measurement of pressure-simple and differential manometers, Total pressure and centre of pressure on vertical, horizontal and Inclined surfaces.

Buoyancy: Stability of submerged bodies and floating bodies; Meta-centre and meta-centric height**.**

UNIT II

Fluid Kinematics: Classification of flows: Steady, unsteady, uniform and non-uniform flows; Laminar and turbulent flows; Streamline; Path line; Streak line; Continuity equation; Velocity potential and stream function.

Fluid Dynamics: Euler's equation of motion; Bernoulli's equation.

Flow Measurement in Pipes: Discharge through a venturimeter and orificemeter; Measurement of velocity by pitot tube.

UNIT III

Orifice and Mouthpiece: Introduction to orifices (Small and large) and mouth pieces.

Notches: Discharge over a Rectangular and Triangular notch.

Boundary Layer Theory: Boundary layer concepts, Characteristics of boundary layer along a thin flat plate, laminar and turbulent Boundary layers, separation of Boundary layers.

UNIT IV

Flow through pipes: Momentum equation, Force exerted by flowing fluid on pipe-bend, major and minor energy losses, Hydraulic gradient and total energy line, pipes in series and parallel; Reynolds's experiments of pipe flow.

Text Books:

2. Hydraulics and Fluid Mechanics by P. N. Modi & S. N. Seth; Standard book house; New Delhi
3. Fluid Mechanics and Hydraulic Machines by R. K. Bansal; Laxmi Publications; New Delhi.

Reference Books:

1. Fluid Mechanics by A. K. Jain; Khanna Publishers, Delhi, 2008
2. Fluid Mechanics by Streeter and wyile, Mc Grawhil Publications.
3. Fluid Mechanics by S K Som & G Biswas (TMH)

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INDIAN CONSTITUTION
II B.Tech – I Semester (Code : 18HU001)

Lectures	2	Tutorial	0	Practical	0	Credits	0
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Course Objectives:
1. To provide basic information about fundamental law of the country.
2. To educate the student about fundamental Rights and fundamental duties of citizens.
3. To educate the students about Government organs, methods of functioning
4. To motivate students to leave narrow selfish out look and inculcate broad national, human out lock.

Learning out Comes:
Upon the successful completion of the course the student will be able to
1. Able to understand the importance of the constitution in a Democratic Society.
2. Understand the Fundamental Rights and make the best use of them.
3. Understand the duties of a citizen and discharge his duties and became a good citizen.
4. Know about Judicial supremacy and Independence of judiciary and fight for his legitimate Rights through court of law.
5. As a citizen he can participate in the democratic process of governance.
6. Participate in nation building activities and be away from destructive outfits.

UNIT-I

1. Meaning of the constitutional law and constitutionalism.
2. Historical perceptive of the constitution of India
3. Salient features and characteristics of the constitution of India.
4. Preamble, union and its territory and citizenship.

UNIT – II

5. Fundamental rights principles.
6. Directive principles of state policy.
7. Fundamental Duties.
8. The government of the union, the president, The Prime Minister, and the council of ministers, The parliament of India, The supreme court, the union judiciary

UNIT – III

9. The Machinery of Government in the states, The Governor, The Chief Minister and council of Ministers, The State legislature, High court, Judiciary in the states

10. Union territories.

11. The Federal System, Division of powers between centre and states, Legislative Administration and Financial relation.

12. Emergency Provisions, President Rule, National Emergency, Financial Emerging

13. Local self Government, Panchayat Raj, Municipalities and municipal Corporation.

UNIT IV

13. Local self Government, Panchayat Raj, Municipalities and municipal Corporation

14. Miscellaneous Provisions, The comptroller and Auditor general of India, The Public Service Commission, Special Provisions relating to certain classes, Elections – Political parties.

15. Amendment of the Constitution.

REFERENCE BOOKS:

1. Constitutional Government in India - M V Pylee – Asia Publishing House
2. Indian Government and Politics – D C Dasgupta. Vikas Publishing house
3. The Oxford Hand Book of the Indian Constitution, Sujit Chowdary, Madhav Khosla Pratapabhem Mehla.
4. Constitutional question in India ; The President , Parliament and the States – Noorani A G – Oxford.
5. Indian Constitution and its features – Astoush Kumar, Anmol Publishers
6. The Constitution of India – Bakshi P M – Universal Law Publishers
7. Legelect's the constitution of India – Ramnarain Yadav, K K Legelest Publication

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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BUILDING DRAWING LABORATORY
II B.Tech – I Semester (Code : 18CEL31)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Course Objectives:

1. To learn basic commands of Auto CAD software.
2. To draw conventional signs, symbols of materials used in a building drawing.
3. To draw the building elements like door, window, foundation and staircase etc
4. To draw plan, section and elevations of buildings and various building components.

Course Outcomes:

1. Basic Auto CAD commands.
2. Various conventional signs, symbols of materials and building elements like door, window and foundation etc.
3. An ability to understand principles of planning, principles of building bye-laws and ability to draw the line diagrams as per National Building Code.
4. Drawing plan, section and elevations of buildings and various building components.

PART A: Basics and introduction to building drawing:

Introduction to building drawing, Importance of building drawing, scale, legend, direction, units, limits, definition-plan, section, elevation, plotting, Learning basic commands of AUTO CAD software.

PART B: Using drawing tools and Auto cad software:

(1) Drawing conventional signs.
(2) Drawing and guidelines for door, window,
(3) Drawing and guidelines for staircase and foundation.
(4) Draw Plan, sections and Elevation of a single room building.
(5) Drawing plan, sections and Elevation of single storey residential building.
(6) Drawing plan, sections and Elevation of two storied residential building.

Note: A minimum of five (5 Nos) shall be done and recorded

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ENGINEERING GEOLOGY LABORATORY
II B.Tech – I Semester (Code : 18CEL32)

Lectures	2	Tutorial	0	Practical	3	Credits	2
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Course Objectives:

- To Identify the Formation of Minerals.
- To Understand the Megascopic Identification of Rocks and Minerals.
- To Understand Geological Maps.
- To inspire the students to think clearly and critically the solution of the civil engineering problems in the context of geological knowledge

Course Outcomes:

Students will be able to

- Ability to categorize rocks and minerals by their origin and engineering properties.
- Ability to apply geological principles to rock masses and discontinuities for use in engineering design e.g. rock slopes, foundation.
- Measure strike and dip of the bedding planes
- Interpret geological maps
- To inspire the students to think clearly and critically the solution of the civil engineering
- Problems in the context of geological knowledge.

Theory:

1. Fundamentals of Photogrammetry, Study of Satellite imageries and SOI Toposheets.
2. Branches of Geology & Weathering.
3. Brief View on Mineralogy, Petrology, Structural Geology.
4. Geophysical Investigations

List of Experiments:

1. Fundamentals of Photogrammetry and Photo interpretation – types of photographs; Vertical photographs
2. Study of Survey of India Topographical Maps
3. Interpretation of Contour maps
4. Study of Satellite Imageries
5. Megascopic identification of minerals

6. Identification of Igneous rocks
7. Identification of Sedimentary rocks
8. Identification of Metamorphic rocks
9. Structural Geology-Problem on strike, Dip.
10. Study and Observation of folds, faults and joints.
11. Structural Geology-Completion of outcrops maps, order of superposition.

Demo & Calculation only:

12. Seismic Hammer Sounding Method
13. Electrical Resistivity Method (Vertical Electrical Sounding)

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SURVEYING LABORATORY
II B.Tech – I Semester (Code: 18CEL33)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Course Objectives

1. To measure chainage of a line using tape and chain and recording of details along the chain line.
2. To find the included angles and local attraction of traverse by using compass.
3. To determine the elevation difference between two points & eliminate errors due to curvature of earth and refraction.
4. To plot a building by using plane table surveying.
5. To measure the horizontal and vertical angles of various points by theodolite.

Learning Outcomes

By the end of the course the students will be able

1. To perform basic field surveys.
2. To prepare a plan of residential building by making use of a chain and compass.
3. To gain excellence in using Auto level, theodolite instruments.
4. To take the levels of existing ground
5. To prepare the plan or map showing the ground features from the data obtained by surveying.

EXPERIMENTS

1. Measurement of area of the plot using Cross staff survey.
2. Traversing by compass and its adjustment.
3. Determination of inaccessible distance using compass survey.
4. Measurement of Horizontal angle by using theodolite.
5. Measurement of Vertical angle by using theodolite.
6. Determination of inaccessible distance using theodolite survey.
7. Determination of difference between two points by simple leveling.
8. Determination of difference between no. of points which are at diff distances by differential levelling.
9. Determination of approximate elevations for reconnaissance survey by Fly leveling.
10. Determination of difference between two points which are separated by some obstruction by reciprocal leveling.
11. Plotting of the longitudinal section of any route by profile leveling.

TEXT BOOKS AND REFERENCES:

1. Surveying Vol-I by Dr K.R. Arora.
2. Surveying Vol-I by Dr B. C. Punmia.
3. Plane surveying by A M Chandra

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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PROFESSIONAL PRACTICE, LAW & ETHICS
II B.Tech – II Semester (Code : 18CE401)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

- To create awareness on professional ethics and Human Values
- To create awareness on Engineering Ethics providing basic knowledge about engineering Ethics, Variety of moral issues and Moral dilemmas, Professional Ideals and Virtues.
- To provide basic familiarity about Engineers as responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards
- To inculcate knowledge and exposure on Safety and Risk, Risk Benefit Analysis and have an idea about the Collective Bargaining, Confidentiality, Professional, Employee, Intellectual Property Rights
- To have an adequate knowledge about MNC's, Business, Environmental, Computer Ethics, Honesty, Moral Leadership, sample Code of Conduct.

Learning Outcomes

- Students understand the core values that shape the ethical behaviour of an engineer and Exposed awareness on professional ethics and human values.
- The students will understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories
- The students will understand various social issues, industrial standards, code of ethics and role of professional ethics in engineering field.
- The students will be aware of responsibilities of an engineer for safety and risk benefit analysis, professional rights and responsibilities of an engineer.
- The students will acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives

UNIT – I

1. Human Values

What is engineering – who is an engineer- Morals, Values and Ethics – Integrity – Work Ethics – Service Learning – Civic Virtue- Respect forOthers – Living Peacefully – Caring – Sharing – Honesty – Courage – Valuing Time – Co-Operation –Commitment – Empathy – Self-Confidence – Character - Spirituality.

UNIT – II

2. Engineering Ethics

Senses of Engineering Ethics – Variety of Moral Issued – Types of Inquiry – Moral Dilemmas –Moral Autonomy – Kohlberg's Theory – Gilligan's Theory – Consensus and Controversy –Professions and Professionalism- Professional Ideals and Virtues - Theories About Right Action –Self-Interest – Customs and Religion – Uses of Ethical Theories.

UNIT – III

3. Engineering as Social Experimentation

Engineering as Experimentation – Engineers as Responsible Experimenters – Codes of Ethics –Balanced Outlook on Law.

4. Safety, Responsibilities and Rights

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk.

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality –Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights –

Intellectual Property Rights (IPR) – Discrimination.

UNIT – IV

5. Global Issues

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development– Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors –Moral Leadership

Sample Code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India),Indian Institute of Materials Management, Institution of Electronics and TelecommunicationEngineers (IETE), India Etc.,

TEXT BOOK

1. Mike martin and Ronald Schinzinger, “Ethics in Engineering” McGraw-Hill, New York 1996
2. Govindarajan M, Natarajan S, Senthil Kumar V.S., “Engineering Ethics”, PHI, New Delhi, 2004

REFERENCE BOOKS

1. Charles D,Fleddermann, “Engineering Ethics”, Pearson / PHI, New Jersey 2004 (Indian Reprint)
2. Charles E Harris, Michael S.Protchard and Michael J Rabins, “Engineering Ethics – Concepts and Cases” Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, “Ethics and the conduct of business” Pearson, New Delhi, 2003.
4. Edmund G.Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers” Oxford University Press, Oxford, 2001.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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ENVIRONMENTAL ENGINEERING
II B.Tech – II Semester (Code : 18CE402)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Objectives:

1. To fill the gap between general introductory environmental science and the more advanced environmental engineering.
2. To explain the different sequential unit operations of water and wastewater treatment processes.
3. To provide necessary engineering principles for analyzing the environmental issues.
4. To motivate the present and future generations to take suitable care of sustainability of all existing resources.

UNIT-I

Water Supply: Objectives of water supply scheme, Estimating requirements; Design period; Per capita consumption; Factors affecting per capita consumption; Fire demand; Fluctuations in demand; Population forecasting methods.

UNIT-II

Water treatment and Distribution: Design of water treatment units such as sedimentation, Coagulation, filtration and disinfection; Methods of Distribution, Layout of Distribution system; Analysis of Distribution by Hardy Cross method and practice for simple networks.

UNIT-III

Introduction to Sanitary Engineering: Conservancy and water carriage system; Sewerage systems; Relative merits and Demerits; Design of sewers; Characteristics of sewage, Expression for BOD.

Sewer Appurtenances Man holes, Drop man holes, Flushing tanks, Street inlets; Catch basins; Storm water regulators;

UNIT-IV

Preliminary and Primary Treatment of Sewage

Preliminary and Primary Treatment Operations: Screens, Grit Chambers, Skimming Tank and Sedimentation Tank

Secondary Treatment:

Trickling filters; Principles of action; Filter types; Recirculation; Final settling tanks; Operational problems and remedies;
Activated sludge process; Features of operation; Organic loading parameters; Methods of aeration; Sludge bulking; Sludge volume index.

TEXT BOOKS:

1. Elements of public health engineering by K.N. Duggal; S.Chand & Company Ltd., New Delhi.
2. Environmental Engineering Vol.I – Water supply engineering by S.K. Garg; Khanna Publishers, Delhi
3. EnvironmentalEngineering vol.II– Sewage disposal and air pollution engineering by S.K.Garg; Khanna Publishers, Delhi
4. Water Supply and Sanitary Engineering by G.S. Bride; Dhanpat rai and sons, Delhi
5. Manual on Water Supply & Treatment; CPH and EEO, Ministry of Urban Development; Govt. of India, New Delhi.

REFERENCES:

1. Metcalf and Eddy, Wastewater Engineering - Collection, Treatment, Disposal and Reuse, McGraw Hill Pub. Co., 1995.
2. H.M Raghunath,Hydrology-Principles,Analysis and Design,New Age International Publishers,1996.
3. Michael,A.M,'IrrigationTheory&Practice,Vikas Publishing House,New Delhi,1978
4. Benefield L.D. and Randall C.D. Biological Process Designs for Wastewater Treatment, Prentice Hall Pub. Co., 1980.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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MECHANICS OF MATERIALS
II B.Tech – II Semester (Code : 18CE403)

Lectures	4	Tutorial	1	Practical	0	Credits	3
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

COURSE OBJECTIVES:
The objective of this Course is:
1. to understand multi-axial stresses and principal stresses and principal strains;
2. to analyse structural members under compound stresses;
3. to derive expression for critical load carrying capacity of columns under different load conditions and apply various failure criteria for general stress states at points;
4. to determine deflections of beams using energy theorems;
5. to determine deflections of beams using geometrical methods.

LEARNING OUTCOMES:
On completion of the course the student will be able to:
1. understand multi-axial stresses and principal stresses and principal strains;
2. analyse structural members under compound stresses;
3. derive expression for critical load carrying capacity of columns under different load conditions and apply various failure criteria for general stress states at points;
4. determine deflections of beams using energy theorems;
5. determine deflections of beams using geometrical methods.

UNIT-I

1. ANALYSIS OF PLANE STRESS

Introduction-The basic problem-Equations for transformation of plane-stress-Principal planes and Principal stresses -Maximum shear stresses-Mohr's circle of stress-Construction of Mohr's circle.

2. COMPOUND STRESSES

Introduction- principal of Superposition and its limitation- Superposition of normal stresses- Eccentrically loaded short columns- Core or kernel of a section- Superposition of shear stresses.

UNIT-II

3. BUCKLING OF COLUMNS

Introduction-Examples of instability- Criteria for stable equilibrium- Euler load for column with pinned ends- Euler loads for columns with different end restraints-Limitations of the Euler's formulae- Generalized Euler buckling load formulae- Eccentric loads and the secant formula.

4. FAILURE THEORIES

Introduction- maximum normal stress theory- maximum shearing stress theory- maximum strain energy theory- maximum distortion energy theory - comparison of theories.

UNIT-III

6. DEFLECTIONS OF STATICALLY DETERMINATE STRUCTURES (ENERGY MEHODS)

Strain energy due to bending - Maxwell's reciprocal theorem- Maxwell–Betti's generalised reciprocal theorem- Castigliano's theorems- Application of Castigliano's theorem for calculating deflection of beams, frames and trusses- Virtual work method for deflections

UNIT-IV

7. DEFLECTIONS OF STATICALLY DETERMINATE BEAMS (GEOMETRICAL METHODS)

Introduction- strain-curvature and Moment-Curvature relation- Governing differential equation for deflection of elastic beams- Alternative differential equations of elastic beams- solution of beam deflection problem by Direct integration and Macaulay's- Introduction to moment area method- Derivation of Moment area theorems- conjugate-beam method- slope and deflection of beams using moment area method and conjugate-beam method.

TEXT BOOKS:

1. Engineering mechanics of solids by E.P.Popov, Prentice Hall of India, 2005.
2. Strength of Materials by R. Subramanian., Oxford University Press, Third Edition, 2016.

REFERENCES:

1. Elements of strength of materials by S.P.Timoshenko and D.H.Young, Affiliated East-West Press
Pvt.Ltd., 2005.
2. Strength of materials by S. S. Bhavikatti, Vikas Publishing House Pvt. Ltd., 1998.
3. Strength of materials by R. K. Bansal, Lakshmi Publications (P) Ltd., 2007

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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HYDRAULICS & HYDRAULIC MACHINES
II B.Tech – II Semester (Code: 18CE404)

Lectures	3	Tutorial	1	Practical	0	Credits	3
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Prerequisites: None

Course Objectives:

CO1: Design of open channels for most economical sections like rectangular, trapezoidal and circular sections
CO2: Understand Gradually Varied flow and Rapidly Varied Flow though the channels and its applications
CO3: Understand the mechanics of impact of jet on various types of vanes and components, function.
CO4: Design of Impulse and Reaction Turbines
CO5: Perform dimensional analysis of a given set of variables using Buckingham's π theorem and relate the model and prototype.

Course Outcomes: Students will be able to
CLO-1: Know the different types of channels and design of channels.
CLO-2: Get the skills to solve problems in uniform, gradually and rapidly varied flows in steady state conditions.
CLO-3: Will know the hydrodynamic forces acting on vanes and their performance evaluation.
CLO-4: In a position to evaluate the performance characteristics of hydraulic turbines and pump.
CLO-5: Formulate and solve dimensional analysis

UNIT I

Open Channel Flow (Uniform Flow): Comparison between open channel flow and pipe flow, Types of channels, Chezy's and Manning's equation, Flow through a Rectangular, Trapezoidal and Circular channels. Most efficient channel section- Rectangular, Trapezoidal and Circular.

Open Channel Flow (Non uniform Flow): Specific energy, Specific energy diagram, Critical flow, critical flow in rectangular channel, Channel transitions.

UNIT II

Gradually Varied Flow (GVF): Gradually varied flow in rectangular channels-equation, Classification of channel slopes, classification of surface profiles.

Rapidly Varied Flow (RVF): Hydraulic jump, elements and characteristics of hydraulic jump, Types of hydraulic jump, Location and applications of hydraulic jump, Energy loss in a hydraulic jump and Backwater curve length.

UNIT III

Impact of Jets: Force exerted by the jet on a stationary and moving plates – vertical, inclined and curved, force exerted by jet on flat plates series of vanes.

Turbines: Classification of turbines and working principles of turbines, draft tube-types, draft tube theory, specific speed and unit quantities.

UNIT IV

Centrifugal Pumps: Manometric head; losses and efficiencies; work done, working principle; priming; velocity triangles; performance and characteristics curves; multistage pumps and cavitation effects.

Dimensional analysis & Model similitude: Introduction, Rayleigh's method and Buckingham's PI theorem, Types of similarities, Dimensionless numbers.

TEXT BOOKS:

1. Hydraulics and Fluid Mechanics by P. N. Modi & S. N. Seth; Standard book house; New Delhi
2. Fluid Mechanics by A. K. Jain; Khanna Publishers, Delhi, 2008

REFERENCE BOOKS:

1. Fluid Mechanics by Streeter and wyile, Mc Grawhill Publications.
2. Flow in Open Channel by K.Subramanya, Tata Mc Grawhill Publications.
3. Fluid Mechanics and Hydraulic Machines by R. K. Bansal; Laxmi Publications.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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CONCRETE TECHNOLOGY
II B.Tech – II Semester (Code : 18CE405)

Lectures	4	Tutorial	0	Practical	0	Credits	3
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

UNIT-I

1. Cement
General, Manufacture of Portland cement by dry process, Approximate oxide composition limits of OPC, Bogue's compounds, heat liberation from a setting cement, structure of hydrated cement, water requirements for hydration.

2. Types Of Cements
Ordinary Portland cement, Rapid hardening cement, Sulphate resisting cement, Slag cement, Quick setting cement, Super sulphated cement, Portland pozzolana cement, air entraining cement, coloured cement, expansive cement, High alumina cement.

3. Testing, Handling And Uses Of Cement
Fineness of cement using sieve test and air-permeability method, Normal consistency and setting times using vicat apparatus, soundness test using Le-chatlier apparatus, Grades of cement as per IS specifications, physical and chemical requirements of OPC for different grades of cement.

4. Aggregates
Classification, source, size and shape texture and influence of texture on strength, specific gravity of aggregates, moisture in aggregates, bulking of fine aggregate, methods used for determination of moisture content of aggregates, grading of aggregates, sieve analysis, standard grading curve, grading limits of fine aggregates as per IS.

UNIT-II

5. Water
Quality of water for mixing concrete, Tolerable concentrations of some impurities in mixing water, permissible limit for solids as per IS456-2000.

6. Admixtures and Construction Chemicals
General, plasticizers and super plasticizers – Dosage, mixing procedure, equipment, effect of super plasticizes on the properties of hardened concrete, Retardors, accelerators. Air-entraining admixtures, fly ash, effect of fly ash on fresh and hardened concrete, high volume fly ash concrete, silica fume, available forms, effect of silica fume on compressive strength of concrete.

7. Fresh Concrete

Workability, factors affecting workability, slump test, Kelly ball test, V-B test, compaction factor test, segregation, bleeding, volume batching and weigh batching, hand mixing, machine mixing, mixing time, compaction of concrete, hand compaction, compaction by vibration.

UNIT-III

8. Hardened Concrete

General; water-cement ratio; gel/space ratio; gain of strength with age; maturity concept of concrete; effect of maximum size of aggregate on strength.

9. Test on Hardened Concrete

Compression test; moulds and compacting; curing; failure of compression specimen; effect of height/diameter ration strength; flexural strength of concrete; tensile strength of concrete; non-destructive testing methods (R.H Test and U V Test)

10. Durability of Concrete

Factors contributing to cracks in concrete, sulphate attack and methods of controlling sulphate attack, chloride attack, corrosion of steel and its control.

UNIT-IV

11. Introduction To Special Concretes And Concreting Methods

a) Fibre reinforced concrete; Fibers used, factors effecting properties, aspect ratio of fibers, orientation of fibers, workability, mixing, applications, current development in FRC.

b) Light-weight concrete: Natural and artificial light-weight aggregates, properties of common light-weight concretes

c) High performance concrete.

12. Proportioning Of Concrete Mixes

Concept of mix design, variables in proportioning, different methods of mix design, nominal mix and design mix, Indian standard method of mix design (IS 10262-2019).

TEXT BOOK

1. Concrete technology by M.S.Shetty, S.Chand & Company Pvt. Ltd., New Delhi

REFERENCE BOOKS

1. Properties of concrete by A.M.Neville, Longman Publishers

2. Concrete technology by M.L.Gambhir, Tata McGraw-Hill Publishing company Ltd., New Delhi

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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TECHNICAL ENGLISH
II B.Tech – II Semester (Code : 18EL002)

Lectures	3	Tutorial	0	Practical	0	Credits	2
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

UNIT-I

1.1 Vocabulary Development: Familiarising Idioms & Phrases
1.2 Grammar for Academic Writing: Making Requests
1.3 Language Development: Using Transition & Link words
1.4 Technical Writing: Letter Writing & Email Writing

UNIT-II

2.1 Vocabulary Development: Analogous words, Gender Sensitive language
2.2 Grammar for Academic Writing: Tenses: Simple Past /Present Perfect, The Future: Predicting & Proposing
2.3 Language Development: Cloze tests
2.4 Technical Writing: Technical Reports

UNIT-III

3.1 Vocabulary Development: Abbreviations& Acronyms
3.2 Grammar for Academic Writing: Describing(People/Things/Circumstances) : Adjectival & Adverbial groups
3.3 Language Development: Transcoding (Channel conversion from chart to text)
3.4 Technical Writing: Circular, Memos, Minutes of Meeting

UNIT-IV

4.1 Vocabulary Development: Corporate vocabulary
4.2 Grammar for Academic Writing: Inversions & Emphasis
4.3 Language Development: Reading Comprehension
4.4 Technical Writing: Resume Preparation

REFERENCE BOOKS

- Communication Skills, Sanjay Kumar & Pushpa Latha. Oxford University Press: 2011.
- Technical Communication Principles and Practice. Oxford University Press: 2014.
- Advanced Language Practice, Michael Vince. MacMilan Publishers: 2003.
- Objective English (Third Edition), Edgar Thorpe & Showick. Pearson Education: 2009
- English Grammar: A University Course (Second Edition), Angela Downing & Philip Locke, Routledge Taylor & Francis Group: 2016

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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HYDRAULICS & HYDRAULIC MACHINES LABORATORY
II B.Tech – II Semester (Code: 18CEL41)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Note: A minimum of twelve (12No) shall be done and recorded

1. Verification of Bernoulli's theorem.
2. Venturimeter: Determination of Coefficient of discharge.
3. Orificemeter: Determination of Coefficient of discharge.
4. Orifices: Determination of Coefficient of discharge.
5. Mouthpieces: Determination of Coefficient of discharge.
6. Characterization of laminar and turbulent flows by Reynold's apparatus.
7. Determination of friction factor of Pipes.
8. Determination of loss of head in pipes due to bends, sudden contractions and sudden expansion.
9. Determination of Coefficient of discharge for rectangular and V – notches.
10. Determination of Manning's and Chezy's coefficients in open channel.
11. Measurement of force due to impact of jets on vanes of different types.
12. Performance studies on Pelton turbine.
13. Performance studies on Francis turbine/Kaplan turbine.
14. Performance studies on single stage centrifugal pump.
15. Performance studies on Reciprocating pump.

BAPATLA ENGINEERING COLLEGE: : BAPATLA
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ENVIRONMENTAL ENGINEERING LABORATORY
II B.Tech – II Semester (Code: 18CEL42)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment		:	50	Semester End Examination (3 Hours)			50

Note: A minimum of twelve (12No) shall be done and recorded

1. Determination of total . suspended and dissolved solids in water / sewage sample.
2. Determination of fixed and volatile solids in water / sewage sample.
3. Determination of Settleable Solids.
4. Determination of turbidity of water / sewage sample.
5. Determination of pH value of water / sewage sample.
6. Determination of optimum dosage of coagulant.
7. Determination of residual chlorine.
8. Determination of temporary and permanent hardness of water sample.
9. Determination of chloride concentration of water / sewage sample.
10. Determination of acidity of water sample.
11. Determination of alkalinity of water sample.
12. Determination of fluorides in water sample.
13. Determination of Dissolved Oxygen of water / sewage sample.
14. Determination of Biochemical Oxygen Demand (BOD) of waste water.

BAPATLA ENGINEERING COLLEGE : : BAPATLA
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MATERIALS TESTING LABORATORY
II B.Tech – II Semester (Code : 18CEL43)

Lectures	0	Tutorial	0	Practical	3	Credits	1
Continuous Internal Assessment			: 50	Semester End Examination (3 Hours)			50

1. **Cement tests**
    a. Fineness of cement
    b. Specific gravity of cement
    c. Normal consistency of cement
    d. Initial setting time of cement
    e. Compressive strength of cement.

2. **Fine aggregate tests**
    a) Specific gravity of fine aggregate
    b) Sieve analysis of fine aggregate
    c) Bulking of sand.

3. **Coarse aggregate tests**
    a) Specific gravity of coarse aggregate
    b) Sieve analysis of coarse aggregate.

4. **Mix design as per IS 10262:2019.**

5. **Concrete tests**
    a) Workability tests (Slump & Compaction factor)
    b) Compressive strength of concrete.
    c) Split tensile test.
    d) Modulus of rupture

6. **NDT – Rebound hammer testing & UPV**

7. **Stress-Strain characteristics of mild steel bar. & HYSD**

8. **Determining shear strength of mild steel bar & HYSD Bar**
9. **Hardness test of Steel & Brass**
10. **Determining Young's Modulus of Steel and Wood (using simply supported beam)**

Quotations for the Students

- Concerned about Environment: If you plan for 1 year -*Plant rice*; If you plan for 10 years - *Plant trees*; If you plan for 100 year - *Educate people*
- All great leaders are great readers
- Knowledge is a treasure but practice is the key to it
- Be a light, not a judge. Be a model not a critic. Be part of the solution, not part of the problem
- Self-trust is the first secret of success
- Success is a journey not a destination
- There are no shortcuts for success. The only route is hard work
- There is nothing impossible because the word says itself I am possible
- Reading is to the mind what exercise is to the body
- Obstacles are great incentives
- Imagination is more important than knowledge
- An ounce of knowledge is more precious than tons of gold
- The one who wants to climb the ladder, must begin at the bottom
- Happiness is a habit - cultivate it
- Ability will get you success, Character will keep you successful

ADMINISTRATIVE & LIBRARY BLOCK

RESEARCH PARK

CIVIL & MECHANICAL BLOCK

LADIES HOSTEL

GENERAL ENGINEERING BLOCK

GUEST HOUSE

Bapatla Engineering College (Autonomous)

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Thrice Accredited by NBA
Mahatmajipuram, GBC Road, Bapatla-522102,
Guntur District, Andhra Pradesh