**1.1.3 Courses having focus on employability/ entrepreneurship/ skill development offered by the University during the year**

| Color Index | |
|---|---|
| Employability | Yellow |
| Entrepreneurship | Green |
| Skill Development | Pink |

**DEPARTMENT OF CIVIL ENGINEERING(DCE)**

# Courses ofStudy

**B.Tech.**

**Civil Engineering**

**(CE)(2019-23BATCH)**

## Lingaya'sVidyapeeth,Faridabad

# Vision

**TocontributetoIndiaandtheWorldthroughexcellenceinscientificandtechnicaleducationandresearch;toserveasavaluableresourceforindustryandsociety;and remain asourceof prideforall Indians.**

# Mission

- **To generate new knowledge by engaging in cutting-edge research and topromoteacademicgrowthbyofferingstateof-the-artundergraduate,postgraduateand doctoral programmes.**
- **To identify, based on an informed perception of Indian, regional and globalneeds,areasof specializationuponwhichtheInstitutecanconcentrate.**
- **To undertake collaborative projects which offer opportunities for long-terminteractionwithacademiaand industry.**
- **Todevelophumanpotentialtoitsfullestextentsothatintellectuallycapableandimaginativelygiftedleaderscanemergeinarangeofprofessions.**

# Values

- **Academicintegrityandaccountability.**
- **Respectand tolerance for the views ofeveryindividual.**
- **Attentiontoissuesofnationalrelevanceaswellasofglobalconcern.**
- **Breadthofunderstanding,includingknowledgeofthehumansciences.**
- **Appreciationofintellectualexcellenceandcreativity.**
- **Anunfetteredspiritofexploration,rationalityandenterprise.**

# Courses of

# Study2019–2023

**(Applicable to UndergraduateStudentsofEntryYear2019)**

**Bachelor of**
**TechnologyIn**
**CivilEngineering**

**DepartmentofCivilEngineering**
**Lingaya'sVidyapeeth,Faridabad**

# Preface

There hasbeena concern aboutquality of technicaleducationinIndiaalthoughintermsofaccess and equity, India has done very well. Lingaya'sVidyapeeth is mandated for planned andcoordinated development of Technical Education with the guidelines of AICTE; regulate propermaintenanceofnorms &standards andexpansion oftechnicalEducation withQuality.

Duringthemeetingsheldfordevelopingmodelcurriculumforundergraduateengineeringcourses, a concern was shared that n the present system, the first-year syllabus is heavily loadedand it is of utmost importance that the students entering into the first year of an engineeringcourse should feel at ease by lowering the burden of syllabus and credits. This is necessary for astudent to acclimatize to the new environment of a college and to create a bonding between theteacher and a student. An idea to introduce induction program in the curriculum to equip thestudents with communication skills, and get them acquainted with the culture of institution andhuman values was formalized. A student has to undergo this induction program after joining theinstitute and before the commencement of classes. Normal classes of the engineering programshall begin after the students have undergone a three-weeks induction program. The Inductionprogramforstudentscomprisesof Physicalactivities;Learninganartform;Literature&Cinema;SocialAwareness;Lectures&Visits;UniversalHumanValues;FamiliarizationtoDepartment/Branch, College&Innovations.

Also, Lingaya'sVidyapeeth has made one semester internships mandatory before completion ofunder graduation. This will equip the students with practical understanding and training aboutindustrypractices in a suitableindustryor organization.

Lingaya'sVidyapeeth will ensure the revision of the model curriculum on regular basis and thisupdation will certainly help students to achieve better employability; start-ups and other avenuesforhigherstudies.

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# LISTOFABBREVIATIONS/SYMBOLS

| Abb./Symbols | Description |
|---|---|
| AICTE | All IndiaCouncilofTechnicalEducation |
| DCE | DepartmentofCivilEngineering |
| UG | UnderGraduate |
| PG | PostGraduate |
| PE | ProgrammeElective |
| OE | OpenElective |
| UID | UniqueIdentificationNumber |
| NC | Non-credited |
| CE | CivilEngineering |
| L-T-P | Lecture-Tutorial-Practical |
| SGPA | SemesterGradePointAverage |
| CGPA | CumulativeGradePointAverage |
| NP | NotPass |
| DGPA | DegreeGradePointAverage |
| R &D | Research&Development |

## 1. ACADEMICSYSTEM

### Introduction

The medium of instruction in the University is English. The University follows the Credit BasedSemester System for all courses running in the Civil Engineering Department. The academic yearruns from July through June each year and comprises of two regular semesters. Typically, the firstsemester (odd semester) starts in July and ends in December. The second semester (even semester)startsinJanuaryandendsinMay.DetailedscheduledfortheSemesterisgivenbeforethecommencement of everynew semester.

### AcademicStructure:

ThemajoracademicunitsoftheUniversityareitsvariousSchoolsandDepartments.Theactivitiesofdepartments includeteachingand researchatalllevels.

**(a) AcademicProgrammes:**

Department of Civil Engineering at Lingaya'sVidyapeeth, Faridabad, Haryana offers a variety ofacademicprogrammessuchasB.Tech,M.Tech&Ph.Dforstudentswithawiderangeofbackgrounds.Admissiontotheseprogrammesarebasedonperformanceinnational/Universitylevel entrance tests/ other entrance examinations followed by interviews in some cases. The coursesoffered by Department of Civil Engineering at Lingaya'sVidyapeeth are presently classified intoDiploma,Undergraduate, Postgraduateand Researchprogrammes.

Thisclassificationisbasedprimarilyonentry/admissionqualificationofstudentsratherthanthelevelofdegreeoffered.Forallundergraduateprogrammes,studentsareadmittedafter10+2schooling while for all postgraduate programmes, students are admitted after they have obtained atleastacollegelevelBachelor'sdegree.Incertificateanddiplomaprogramstheentrylevelqualificationmay varyfromprogramto program.

**(b) Student'sUniqueID/RollNumber(UID)**:

Each admitted student is given unique identification number (UID). This UID will remain the sameduring theentire tenureofthestudentwithuniversity.eg.18CE001whichmeansthestudentadmitted in 2018 in Civil Engineering Department. For any communication, students must mentiontheir UID/RollNumber.

## 2. COURSESTRUCTUREANDCREDITSYSTEM

### CourseNumberingScheme

Normally every course at Department of Civil Engineering at Lingaya'sVidyapeeth runs for the fulllength of the semester. At the beginning of the semester, the students register for courses that theywant to study and at the end of the semester a grade is awarded. On obtaining a pass grade, thestudent earns all the credits associated with the course. A fail grade does not get any credit. Partialcreditsare also notawarded.

**CreditSystem:**

Education at the University is organized around the semester-based credit system of study. A studentis allowed to attend classes in a course and earn credit for it, only if he/she has registered for thatcourse. The prominent features of the credit system are a process of continuous evaluation of astudent's performance/progress and flexibility to allow a student to progress at an optimum pacesuitedtohis/herabilityorconvenience,subjecttofulfillingminimumrequirementsforcontinuation.

A student's performance/progress is measured by the number of credits that he/she has earned, i.e.completed satisfactorily. Based on the course credits and grade obtained by the student, grade pointaverage is calculated. A minimum grade point average is required to be maintained for satisfactoryprogress and continuation in the programme. Also, a minimum number of earned credits and aminimum grade point average should be acquired in order to qualify for the degree. All programmesaredefinedby
thetotalcreditrequirementandapatternofcreditdistributionovercoursesofdifferentcategories.

**CourseCreditsAssignment:**

Each course, except a few special courses, has a certain number of credits assigned to it dependingupon its lecture, tutorial and laboratory contact hours in a week. This weightage is also indicative oftheacademic expectationthatincludesin-classcontactand self-studyoutsideofclass hours.

**LecturesandTutorials**:Onelectureortutorialhourperweekpersemesterisassignedonecredit.

**Practical/Laboratory**: One laboratory hour per week per semester is assigned half

credit.Somecoursesare withoutcredit and are referredto asnon-credit(NC) courses.

***Example***:CourseCE-202CSoilMechanics&EngineeringGeology,4credits(3-1-

0)Thecreditsindicatedforthis coursearecomputed as follows

3hours/weeklectures = 3 credits

1hours/weektutorial = 1 credit

0hours/weekpractical =0 x 0.5= 0 credit

Total = 3+0 + 1=4 credits

Also,(3-0-2)**4**creditcourse=(**3**hLectures+**0**hTutorial+**2**hPractical)perweek=**5**contacthoursperweek

**EarningCredits:**

At the end of every course for which a student has registered, a letter grade is awarded in each coursefor which a student had registered. On obtaining a pass grade, the student accumulates the coursecredits as earned credits. A student's performance is measured by the number of credits that he/shehas earned and by the weighted grade point average. A student has the option of auditing somecourses. Grades obtained in these audit courses are not counted for computation of grade pointaverage. However, a pass grade is essential for earning credits from an audit course; this does notapplyto postgraduate programmes.

Aminimumnumberofearnedcreditsarerequiredinordertoqualifyforadegreeandcontinuationof registration at any stage. Currently students in the postgraduate programmes can opt audit coursesbut theydo notcounttowards earnedcredits.

The credit system enables continuous evaluation of a student's performance and allows the studentsto progress at an optimum pace suited to individual ability and convenience, subject to fulfillingminimumrequirementfor continuation.

**CourseContentDescription**

Course content description consists of following components: (i) Course Number, (ii) Title of theCourse; (iii) Credit and L-T-P; (iv) Pre-requisites; (v) Overlapping/Equivalent courses; and (vi)Descriptionofthe content.An example isgiven below:

## 3. GRADINGSYSTEM

The grading reflects a student's own proficiency in the course. While relative standing of the studentis clearly indicated by his/her grades, the process of awarding grades is not necessarily based uponfittingperformanceoftheclasstosomestatisticaldistribution.Thecoursecoordinatorandassociated faculty for a course formulate appropriate procedure to award grades that are reflective ofthe student's performance vis-à-vis instructor's expectation. The credit system enables continuousevaluation of a student's performance, and allows the students to progress at an optimum pace suitedtoindividualabilityandconvenience,subjecttofulfillingminimumrequirement forcontinuation.

**EvaluationofPerformance**

The performance of a student will be evaluated in terms of three indices, viz. the **Semester GradePoint Average** (SGPA) which is the Grade Point Average for a semester, **Cumulative Grade PointAverage** (CGPA) which is the Grade Point Average for all the completed semesters at any point intime,and **Degree GradePointAverage**(DGPA).

The ***Earned Credits*** (EC) is defined as the sum of course credits for courses in which A - D or NP orSgrades have been obtained.

***Points earned*** in a semester = Σ (Course credits *x* Grade point) for courses in which A - D grade hasbeenobtained)

The ***SGPA*** is calculated on the basis of grades obtained in all courses, except audit courses andcoursesin whichS/Zgrade isawarded, registeredforin the particularsemester.

$$SGPA = \frac{\text{Pointssecuredinthesemester}}{\text{Creditsregistered inthesemester,excludingnon credited gradecourses}}$$

The***CGPA***iscalculatedonthebasisofallpassgrades,exceptauditcoursesandcoursesinwhichS/Zgrade is awarded, obtained inallcompletedsemesters.

$$CGPA = \frac{\text{Cumulativepointssecuredinallcourses}}{\text{Cumulativeearned credits,excluding noncredited grade courses}}$$

## 4. REGISTRATIONANDATTENDANCE

### 4.1. Registration

Registration is a very important procedural part of the academic system. The registration procedureensures that the student's name is on the roll list of each course that he/she wants to study. No creditis given if the student attends a course for which he/she has not registered. Registration for courses tobe taken in a particular semester will be done according to a specified schedule before the end of thepreviousssemester.Eachstudentisrequiredtocompletetheregistrationformanddepositthesemesterfeewellinadvance.

Various activities related to registration, the relevant dates are included in the Semester Schedule thatisavailable beforethestartof the semester.

### 4.2. RegistrationandStudentStatus

Registration by a student confirmshis/her status as student at theUniversity. Failure to registerbefore the last date for registration will imply that the student has discontinued studies and his/hernamewillbe struck-off therolls.

EveryregisteredstudentisconsideredasafulI-timestudentattheUniversity.Theyareexpectedtobe present at the University and devote full time to academics. Students registered only for a self-studycourse or onlyfor project orthesis are alsoconsideredasfull-time students.

### 4.3. AdviceonCourses

At the time of registration, each student must consult his/her Mentor/programme coordinator tofinalize the academic programme, keeping in view factors, such as, minimum/maximum numbers oftotallecturecredits,pastperformance,backlogofcourses,SGPA/CGPA,pre-requisite,workloadandstudent's interests,amongstothers.

### 4.4. RegistrationValidation

Before the first day of classes, every student is required to be present on campus and validate his/herregistration by their class in charges. The updated registration record will be available on the Byndrand the hard copy will be available with the student's advisor/programme coordinator / ExaminationSection/HOD. Students who do not register themselves will not be permitted to add/drop courses.However, for the first semester, all the courses are compulsory and students need not to do thisexercise.

### 4.5. LateRegistration

Lateregistrationispermittedwithcertainfileasapplicable.

### 4.6. RegistrationforThePractical Training

Before proceeding for practical training or training as part of curricular requirement, the studentshould register for the respective course after obtaining approval from the training coordinator andHead of the department. On returning after training a continuation grade will be awarded and thestudents must register for the course in the regular semester immediately following the trainingperiod. During this semester, evaluation of the training will be carried out and regular grade will beawarded.

### 4.7. ContinuousAbsenceandRegistrationStatus

If a student is absent from the University for more than four weeks without notifying the Head ofDepartment/Dean,his/herregistrationwillbeterminatedandnamewillberemovedfromtheUniversityrolls.

### 4.8. AttendanceRule

a) It is mandatory for the students to attend all classes. Attendance Records of all students for eachcoursewillbe maintained.

b) For all 1st year courses the attendance will be taken and maintained by U.G. Section. If any student'sattendance falls below 75% attendance in any of these courses, he/she may be put under academicprobation.Henceforth,he/shewill begovernedbytherulesforstudent underacademic probation.

c) For all other courses, the Course Coordinator will announce the class policy on attendance withrespect to grading etc., at the beginning of the semester. This shall be done keeping in mind theimportance of classroom learning in the teaching-learning process. Once the class attendance policyhasbeenmadeclearto all the studentsregistered for the course, theCourseCoordinator willimplement the same in totality.

For the purpose of attendance calculation, every scheduled practical class will count as one unitirrespectiveofthe numberof contacthours.

Attendance record will be maintained based upon roll calls (or any equivalent operation) in everyscheduled lecture, tutorial and practical class. The course coordinator will maintain and consolidateattendancerecordforthecourse(lectures,tutorialsandpractical'stogether, as applicable).

## 5 UNDERGRADUATEDEGREEREQUIREMENTS,REGULATIONSANDPROCEDURES

### 5.1 OverallRequirements

**B.Tech.**

The totalcreditrequirementfortheB.Tech.(4-yearprogramme)is190credits.ForB.Tech.programmes,thetotalcredits are distributed overfollowingcategories:

TheUndergraduatecore(UC)hasfollowingcategories:

| Course Category | Description |
|---|---|
| BSC | BasicScienceCourses |
| PCC | Professional CoreCourses |
| HSMC | HumanitiesandSocial SciencesincludingManagementCourses |
| ESC | EngineeringScienceCourse |
| PEC | ProfessionalElectiveCourse |
| OEC | OpenElectiveCourse |
| MC | MandatoryCourse |
| PROJ | Project |
| INT | Internship |
| MOOC | MassiveOpenOnlineCourses |

### 5.2 DegreeRequirementsBreakup

Thedegreerequirementsforthevariousprogrammeslistedearlieraredetailedbelow.

#### 5.2.1 EarnedCredits

i. Completionof180earnedcreditsoutof190creditsfor4-yearB.Tech.Programmessubjecttopassinallcompulsorycourses.

Thesecreditsareneededtobeearnedunderdifferentcategoriesforindividualprogrammes.

#### 5.2.2 DegreeGradePointAverage(DGPA)Requirement

AstudentmustobtainaminimumDGPAof5.0tobeeligibleforawardoftheB.Tech.,M.Tech.programme.

Allexceptionstotheaboveconditionswillbedealtwithasperfollowingregulations:

IfastudentcompletesrequiredcreditsforB.Tech./M.Tech.withDGPAlessthan5,thenthestudentwillbe permitted to do additional elective courses under appropriate category to improve the DGPA within themaximum time limit for completion of B.Tech./ M.Tech. degree respectively, as the case may be. IncaseaDGPAof5ormoreisachievedwithinthestipulatedperiod,aB.Tech./M.Tech.degreewillbeawarded andincasethesameisnotachievednodegreewillbeawarded.

#### 5.2.3 Practical Training

A student of the B.Tech.must complete the prescribed number of days of practical training to thesatisfaction of the concerned department. This training will be arranged in the 8$^{th}$ semester. Practicaltrainingdurationisaminimumof50workingdays.Practicaltrainingshouldbecarriedoutpreferablyin industry or R & D institutions in India. Practical training in academic institutions is not permitted. InsomespecialcasesthepermissionmaybegrantedwithpriorapprovalofAcademicCouncil.

#### 5.2.4 Break-UpofCredits

Thebreakupofvariouscategoriesofcoursesareasfollows:

| Course Category | Description | Credit |
|---|---|---|
| BSC | BasicScienceCourses | 23 |
| PCC | Professional CoreCourses | 77 |
| HSMC | HumanitiesandSocial SciencesincludingManagementCourses | 16 |
| ESC | EngineeringScienceCourse | 23 |
| PEC | ProfessionalElectiveCourse | 20 |
| OEC | OpenElectiveCourse | 3 |
| MC | MandatoryCourse | 3 |
| PROJ | Project | 7 |
| INT | Internship | 16 |
| MOOC | MassiveOpenOnlineCourses | 3 |

Thebreakupofcoursesemesterwiseareasfollows:

| Sr.No. | Semester | Credits |
|---|---|---|
| 1 | First | 24 |
| 2 | Second | 20 |
| 3 | Third | 22 |
| 4 | Fourth | 27 |
| 5 | Fifth | 27 |
| 6 | Sixth | 26 |
| 7 | Seventh | 25 |
| 8 | Eighth | 19 |
| Total | | 190 |

### 5.3 LowerandUpperLimitsforCreditsRegistered

A student must register for a minimum of 12 credits and a maximum of 27 credits in a semester. Theminimum and maximum lecture credits that a student can register for in a semester are 9 and 18,respectivelyexceptthe8$^{th}$semesterofB.Techprogrammewhenminimumcreditsare9andmaximumcreditsare18.

For Integrated M.Tech.programmes, the above limits apply up to the 8$^{th}$semester. In the 9$^{th}$and 10$^{th}$semesters, these students will normally register for a minimum of 9 credits and a maximum of 22credits per semester. Under exceptional circumstances a student can register for a maximum of 28credits including not more than 6 (six) 'L' (Lecture) courses. However, this will be permitted at mosttwice during the programme in semesters other than 1$^{st}$and 2$^{nd}$ and those in which the student isregistered for Major Project Part 1 or 2. These conditions will not be applicable for those studentswhoareon probationaccordingto the criteriadefined.

### 5.4 MaximumDurationforCompletingDegreeRequirements

**1.** The maximum permitted duration of each programme will be determined in terms of number ofregistered regular semesters, hereinafter called registered semesters. Any semester in which a studenthasregisteredfor acoursewillbecalleda registeredsemestersubjecttothefollowing:

(a) Only the 1$^{st}$and 2$^{nd}$semesters of an academic year can be registered semesters. The summer semesterwillnotbe considered as aregistered semester.

(b) A semester when a student has been granted semester withdrawal or granted leave will not beconsideredas aregistered semester.

(c) The semester when a student is suspended from the Institute on disciplinary grounds will not becountedtowards the numberofregistered semesters.

The summer semesters falling in between the permitted registered semesters shall be available for earningcredits.Afterthestudenthasregisteredforthemaximumpermissiblenumberofregisteredsemesters, thesubsequentsummer semesters willnotbeavailable forearningcredits.

**2.** The maximum permissible number of registered semesters for completing all degree requirementswould be:

Table9.Maximumpermissibledurationforcompletingdegreerequirements.

| Programme Name | Maximumnumberofregisteredsemesterspermittedforcompletingdegree requirements |
|---|---|
| B.Tech. | 12(*) |
| M.Tech. | 8 (*) |

Note:(*)Ifastudentoptsfortheslow-pacedprogramme(asdefinedinclauseB1),thenthemaximumpermissiblenumberofregisteredsemesters shallbeincreased bytwosemesters.

### 5.5 CoursesofSpecialNature

**a) MajorProject**

A course under this title may be floated by departments from fifth semester onwards. Major projectwill be a regular course to conduct a design and fabrication type project. The student and teacherwould decide upon the topic, prepare a plan of work and get the approval of the Course Coordinatorbeforetheendofthesemesterwhenthecourseisregisteredfor.Thedurationofthecoursewillbeth e entire semester. A project report would be submitted by the student on completion of the course.The student's performance will be evaluated by a departmental committee via a mid-term and a finalevaluation.Major-projectcanbedonejointlyby3students

**b) PracticalTraining**

Practical Training is to be done typically in eights semester. The duration for practical training is onesemester, preferably in an industry orR&D institution in India.Practicaltraining in academicinstitutionsisnotpermitted.

It is the joint responsibility of the departments and the Training and Placement (T&P) unit to arrangefor training for all their students. In the beginning of each academic session, T&P unit will prepareprogramme-wiselistsofpotentialtrainingorganizationsinconsultationwiththerespectivedepartments. These organizations will be approached by the T&P unit with a request to providetraining seats. Consolidated lists of training offers will be made available to the students throughdepartmentsinthebeginningofthesecondsemesterofthesession.Ifastudentisinterestedinmakingh is/her own arrangement for the training seat, he/she will need to have the training organizationapproved and route the application through the departmental training in charge and T&P unit. Allsuch applications must be completed before the end of first semester. No self-arranged practicaltraining, not approved through the above process, will be allowed and faculty members will not signanyforms forthepurpose.

Thedepartmentwillappointatrainingsupervisorforeachstudent.Thesupervisorisexpectedtokeepcontact with the assigned students through e-mail and /or telephone. The students will be required toget their training plan reviewed by their supervisor within the first week and report their progress onweekly basis. The supervisor, if desires, may visit the organization. Visits within the country will besupportedbytheinstitute.

c) **OpenCategory**

Opencategorycreditsshouldprovideanopportunitytoastudenttoexercisehis/heroptionsinanunrestrictedfashion.

Astudentcancompleteopencategorycreditsbychoosingcoursesfromdifferentdepartments.Thestudent willbe permittedtoregisterformaximumof 2courses underopencategory.

**5.6 MajorProjectGuidelines**

Allstudentswhoareonprojectarerequiredtosubmitthereport(OneperGroup)aftertheworkdone.

**Evaluation**

**1.** Weightageofdifferent evaluationcomponentsareshowninbelowtable

| **EvaluationComponent** | **Weightage(%)** |
|---|---|
| **RegularAssessment** | |
| 6InteractionwithGuideof5MarksEach | 30 |
| • 2 Presentation of 10 Marks each (PPT + ProgressReport)<br>• Alongwith MidTermI&IIrespectively | 20 |
| **EndSemester Evaluation** | |
| Presentation | 15 |
| Viva | 15 |
| Final Report | 10 |
| **PaperPublication/Presentation**<br>Paper Presentation in National or InternationalConferenceorseminarheldinIIT/NIT.<br>Paper Presentation in National or InternationalConferenceorseminarheldinanycollege.<br>Paper published in recommended/index journal.Paperpublished in open accessjournal.<br>Paperpublished/presentedinanyuniversity | 8<br>5<br>10<br>6<br>7 |
| **Note:**Maximum10markscanbeobtainedin**paperpresentation/published**category**.** | |
| **Total** | **100** |

**2.** Suggestedpointstobejudgedthrougheachevaluationcomponent

2.1 **Evaluation by supervisor on weekly basis:** Observation is a channel for the evaluation ofstudent performance on the basis of their frequent interaction with the faculty supervisor. Thestudents are required to make the handwritten report of their progress in every week with thefacultysupervisor.

2.2 **Project Report**: The draft of the Project Report should be submitted at the submission ofproject atthecampus.The reportisawrittenpresentationof theworkdonebythe studentsonhis

overall learning in the project. If a group of students are working on same project they arerequiredtosubmitindividualreport.

Guidelines and format for writing a project report are given at the end of document which may bereviewed by faculty supervisor. The assessment of project report will be done by the committeeconsistingof externalexaminerandfacultysupervisorduringpresentation.

2.3 **Publicationonproject:**Thestudentsshouldpublishapaperonprojectwork.

2.4 **Presentation/Viva**:Thestudentsneedtopresenttheirprojectreport.Throughthesepresentations the faculty supervisor will be able to evaluate the students on their overall learningin the project. This presentation will be conducted at the campus by the committee consisting ofexternal examinerand facultysupervisor.

**2.5 Evaluation by Examiner: The evaluation by external examiner will also be done on vivabasis.**

2.6 **MajorProjectRegistrationForm:** AttachedasAnnexureI.

**2.7 ReportWritingGuidelines**

- Writein**TimesNew Roman** fontwith12**fontsize**.
- Spacingbetweenconsecutivelinesshould be1.5.
- Separatesuccessive paragraphs bybefore 10pointsandafter4points.
- PageMargins-Top:1",Bottom: 1", Left:1.5",Right:1".
- Figurename,table name,shouldbe inTimes NewRomanfontwith10fontsize.
- ChaptertitleshouldbeboldandwriteinArial font with16font size.
- Eachheadingshouldbe boldand write inTimesNew Roman with 14fontsize.
- Subheadingshould beboldandwriteinTimes New Romanwith 12 fontsize.
- Headingandsubheadingmattershould beinTimes New Romanwith 12 font size.
- AtotalofTHREEhardboundcopiesinblackcolorbackgroundwithtextingoldencolormust beprepared – onefortheguide,secondfordepartment and thirdforthe library.
- Project Reportshouldbe minimumin**60 pages.**
- Asoftcopycontainingthedocument and presentationshouldbe submittedwiththe report.
- It should completelyrefertothesynopsissubmitted.
- Theproject workshouldbeimplemented atthelaboratorybeforetheprojectPresentation.
- Presentation duration for each group isamaximum of30 minutes andmaximum 2 studentscan enrollin a group.
- PresentationshouldbepresentedthroughPowerPointslideshowcontainingatleast20slides.
- Itisalsosuggestedtostudentskeeponehardcopywiththemdulysignedbythesupervisorand Externalexaminer.

**SCHEME FROM-2020**
**BATCHSCHOOLOFENGINEERING & TECHNOLOGY**
**Department of Civil**

**B.Tech(CE)**

| 1st Year SEMESTER– I | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | BSC | BSC-101 | Physics | 3-1-0 | 4 | ALL |
| 2 | BSC | BSC-103 | Mathematics-I | 3-1-0 | 4 | ALL |
| 3 | ESC | ESC-101 | BasicElectricalEngineering | 3-1-0 | 4 | ALL |
| 4 | ESC | ESC-103 | IntroductiontoComputerSystems&Internet Basics | 3-0-0 | 3 | ALL |
| 5 | ESC | ESC-153 | EngineeringGraphics & Design | 0-0-6 | 3 | ALL |
| 6 | HSMC | HSS-101 | English | 2-0-0 | 2 | ALL |
| 7 | BSC | BSC-151 | PhysicsLab | 0-0-2 | 1 | ALL |
| 8 | ESC | ESC-151 | BasicElectricalEngineeringLab | 0-0-2 | 1 | ALL |
| 9 | HSMC | HSS-151 | EnglishLab | 0-0-2 | 1 | ALL |
| 10 | MC | MC-101 | EnvironmentalScience | 2-0-0 | 0 | ALL |
| 11 | HSMC | PDP-101 | Induction&NurturingHobbies | 0-0-2 | 1 | ALL |
| | | | | **16-3-14** | **24** | |

| 1st Year SEMESTER – II | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | BSC | BSC102 | Chemistry | 3-1-0 | 4 | ALL |
| 2 | BSC | BSC-104 | Mathematics-II | 3-1-0 | 4 | ALL |
| 3 | ESC | ESC-102 | Programmingfor problem solving | 3-0-0 | 3 | ALL |
| 4 | HSMC | HSS-102 | EffectiveTechnicalCommunication | 3-0-0 | 3 | ALL |
| 5 | ESC | ESC-154 | Workshop/ManufacturingPractice | 0-0-4 | 2 | ALL |
| 6 | BSC | BSC152 | ChemistryLab | 0-0-2 | 1 | ALL |
| 7 | ESC | ESC-152 | ProgrammingforproblemsolvingLab | 0-0-4 | 2 | ALL |
| 8 | HSMC | PDP-102 | PeopleConnect | 0-0-2 | 1 | ALL |
| 9 | MC | MC-102 | ConstitutionofIndia | 2-0-0 | 0 | ALL |
| | | | | **14-2-12** | **20** | |

**SCHEME FROM-2020**
**BATCHSCHOOLOFENGINEERING & TECHNOLOGY**
**Department of Civil**

**B.Tech(CE)**

| 2nd Year SEMESTER–III | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | BSC | BSC-201 | Mathematics-III(NumericalMethods) | 3-1-0 | 4 | CE+ME |
| 2 | PCC | ME203C | FluidMechanics | 3-1-0 | 4 | CE+ME |
| 3 | ESC | ME205C | EngineeringMechanics | 3-1-0 | 4 | CE+ME |
| 4 | HSMC | CE201C | IntroductiontoCivilEngineering | 3-0-0 | 3 | CE |
| 5 | PCC | CE203C | BuildingMaterials&Construction | 3-0-0 | 3 | CE |
| 6 | ESC | CE251C | ComputerAidedCivilEngineeringDrawing | 0-0-2 | 1 | CE |
| 7 | BSC | BSC-251 | Mathematics-III(NumericalMethods)Lab | 0-0-2 | 1 | CE+ME |
| 8 | PCC | ME256C | FluidMechanics Lab | 0-0-2 | 1 | CE+ME |
| 9 | HSMC | PDP201 | PersonalityDevelopment&Grooming | 0-0-2 | 1 | ALL |
| | | | | **15-3-8** | **22** | |

| 2nd Year SEMESTER – IV | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | PCC | CE202C | SoilMechanics &EngineeringGeology | 3-1-0 | 4 | CE |
| 2 | PCC | CE204C | DisasterPreparedness&Planning | 3-0-0 | 3 | CE |
| 3 | PCC | ME204C | StrengthofMaterials | 3-1-0 | 4 | CE+ME |
| 4 | PCC | CE206C | Surveying&Geomatics | 3-1-0 | 4 | CE |
| 5 | PCC | CE208C | EnvironmentalEngineering | 3-1-0 | 4 | CE+ME |
| 6 | MC | HSS202 | EngineeringEconomics&Management | 3-0-0 | 3 | CE+ME |
| 7 | PCC | CE252C | SoilMechanics&EngineeringGeologyLab | 0-0-2 | 1 | CE |
| 8 | PCC | ME254C | StrengthofMaterials Lab | 0-0-2 | 1 | CE+ME |
| 9 | PCC | CE254C | Surveying&GeomaticsLab | 0-0-2 | 1 | CE |
| 10 | PCC | CE256C | EnvironmentalEngineeringLab | 0-0-2 | 1 | CE |
| 11 | HSMC | PDP202 | LifeSkills | 0-0-2 | 1 | ALL |
| | | | | **18-4-10** | **27** | |

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**B.Tech(CE)**

| 3rdYearSEMESTER –V | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | PCC | CE301C | Concrete Technology | 3-0-0 | 3 | CE |
| 2 | PCC | CE303C | GeotechnicalEngineering | 3-1-0 | 4 | CE |
| 3 | PCC | CE305C | Hydrology&WaterResourceEngineering | 3-1-0 | 4 | CE |
| 4 | PCC | CE307C | HighwayEngineering | 3-1-0 | 4 | CE |
| 5 | PCC | CE309C | DesignofConcreteStructures | 3-1-0 | 4 | CE |
| 6 | PEC | | ProgramElective-I | 3-0-0 | 3 | CE |
| 7 | PCC | CE351C | ConcreteTechnologyLab | 0-0-2 | 1 | CE |
| 8 | PCC | CE353C | GeotechnicalEngineeringLab | 0-0-2 | 1 | CE |
| 9 | PCC | CE355C | HydraulicEngineeringLab | 0-0-2 | 1 | CE |
| 10 | PCC | CE357C | HighwayEngineeringLab | 0-0-2 | 1 | CE |
| 11 | HSMC | PDP301 | Leadership&EntrepreneurialDevelopment | 0-0-2 | 1 | ALL |
| | | | | **18-4-10** | **27** | |

| | **COURSECODE** | **COURSENAME** |
|---|---|---|
| ProgramElective-I | CE311C | Repair&RehabilitationofStructures |
| | CE313C | ConstructionEquipment's&Automation |
| | CE315C | BuildingConstructionPractice |

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| 3rdYearSEMESTER– VI | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | PCC | CE302C | SpecificationEstimation&Costing | 3-1-0 | 4 | CE |
| 2 | PCC | CE304C | StructuralAnalysis-I | 3-1-0 | 4 | CE |
| 3 | PCC | CE306C | DesignofSteelStructures | 3-1-0 | 4 | CE |
| 4 | PCC | CE308C | OpenChannel Flow | 3-0-0 | 3 | CE |
| 5 | PEC | | ProgramElective-II | 3-0-0 | 3 | CE |
| 6 | PEC | | ProgramElective-III | 3-0-0 | 3 | CE |
| 7 | PEC | | ProgramElective-IV | 0-0-2 | 1 | CE |
| 8 | PCC | CE354C | StructuralAnalysis-ILab | 0-0-2 | 1 | CE |
| 9 | Project | CE358C | Minor Project | 0-0-4 | 2 | CE |
| 10 | HSMC | PDP302 | ProblemSolvingSkills | 0-0-2 | 1 | ALL |
| | | | | **18-3-10** | **26** | |

| | **COURSECODE** | **COURSENAME** |
|---|---|---|
| ProgramElective-II | CE310C | ConstructionProjectManagement |
| | CE314C | ConstructionProductivity |
| | CE318C | ConstructionProject Planning&System |
| ProgramElective-III | CE312C | TrafficEngineering |
| | CE316C | TransportationEconomics |
| | CE320C | TrafficPlanning&Management |
| ProgramElective-IV | CE356C | BuildingDrawingLab |
| | CE358C | ConstructionProjectManagementLab |
| | CE360C | StructuralDrawingLab |

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| 4thYearSEMESTER –VII | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **CourseName** | **L-T-P** | **Cr.** | |
| 1 | PCC | CE-401C | Earthquake Resistant Design of Structures | 3-1-0 | 4 | CE |
| 2 | PCC | CE-403C | Channel Hydraulics | 3-1-0 | 4 | CE |
| 3 | PEC | CE-405C | Traffic Engineering | 3-0-0 | 3 | CE |
| 4 | PEC | CE-407C | Waste Management | 3-0-0 | 3 | CE |
| 5 | PEC | CE-409C | Foundation Engineering | 3-1-0 | 4 | CE |
| 6 | PEC | OE | Open Elective – I(CE-423C-Hydropower Engineering) | 3-0-0 | 3 | CE |
| 7 | OEC | CE-451C | Traffic & Transport Engg. Lab. | 0-0-2 | 1 | ALL |
| 8 | Project | CE-453C | Seminar | 0-0-4 | 2 | CE |
| 9 | HSMC | PDP-401 | Campus to Corporate | 0-0-2 | 1 | ALL |
| | | | | **18-3-8** | **25** | |

**LIST OF OE**

| | **COURSECODE** | **COURSENAME** |
|---|---|---|
| OpenElective-I | CE423C | Hydropower Engineering |
| | CE425C | TransportationEngineering&Systems |

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| **4thYear SEMESTER – VIII** | | | | | | |
|---|---|---|---|---|---|---|
| **SN** | **Category** | **Course Code** | **Course Name** | **L-T-P** | **Cr.** | |
| 1 | PCC | CE402C | Metro Systems & Engineering | 3-0-0 | 3 | CE |
| 2 | INT | CE452C | Internship | 0-0-32 | 16 | CE |
| 3 | INT | CE454C | Seminar on Internship | 0-0-2 | 1 | CE |
| | | | | **3-0-34** | **20** | |

**SCHEME & SYLLABUS FROM-2020**
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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-101 | Physics | 3-1-0 | 4 |

**UnitI:ElectrostaticsandMagnetostatics(12lectures)**
Calculation of electric field and electrostatic potential for a charge distribution; Divergence and curl ofelectrostatic field; Laplace's and Poisson's equations for electrostatic potential, Boundary conditions ofelectricfieldandelectrostaticpotential;methodof images;energyofachargedistributionanditsexpressionin terms ofelectricfield.
Bio-Savartlaw,Divergenceandcurlofstaticmagneticfield;vectorpotentialandcalculatingitforagiven magnetic field using Stokes' theorem; the equation for the vector potential and its solution for givencurrentdensities.

**Unit II:Mechanics(8lectures)**
Transformation of scalars and vectors under Rotation transformation; Forces in Nature; Newton's lawsand its completeness in describing particle motion; Form invariance of Newton's Second Law; SolvingNewton'sequationsofmotioninpolarcoordinates;Problemsincludingconstraintsandfriction;Extensio ntocylindricaland sphericalCoordinates

**Unit III:QuantumMechanics(8lectures)**
Introduction to Quantum mechanics, Wave nature of Particles, Time-dependent and time independentSchrodinger equation for wave function, Born interpretation, probability current, Expectation values,Free-particlewave functionandwave-packets, Uncertaintyprinciple.

**Unit IV:Wave optics(10lectures)**
Huygens'principle,superpositionofwavesandinterferenceoflightbywavefrontsplittingandamplitude splitting; Young's double slit experiment, Newton's rings, Michelson interferometer, Mach-Zehnderinterferometer.
Fraunhauffer diffraction from a single slit and a circular aperture, the Rayleigh criterion forlimitofresolutionanditsapplicationtovision;Diffractiongratingsandtheirresolvingpower.

**UnitV:Lasers(8lectures)**
Einstein's theory of matter radiation interaction and A and B coefficients; amplification oflightbypopulationinversion,different typesoflasers:gaslasers(He-Ne,CO2),solid-state lasers(ruby,Neodymium),dyelasers;Propertiesoflaserbeams:mono-chromaticity,coherence,directionalityandbrightness,laserspeckles,applicationsoflasersinscience,engineeringand medicine.

**SuggestedText/ReferenceBooks**

(i) DavidGriffiths,IntroductiontoElectrodynamics.
(ii) W.H. HaytandJ.A.Buck. EngineeringElectromagnetics.
(iii) EngineeringMechanics,2nded.—MKHarbola.
(iv) IntroductiontoMechanics—MKVerma
(v) EisbergandResnick, IntroductiontoQuantumPhysics
(vi) D.J.Griffiths,Quantummechanics.
(vii) A.Ghatak,Optics
(viii) O.Svelto,PrinciplesofLasers

**SCHEME & SYLLABUS FROM-2020**
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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-103 | Mathematics - I | 3-1-0 | 4 |

**UnitI:Matrices(10lectures)**
Inverseandrankofamatrix,rank-nullitytheorem;Systemoflinearequations;Symmetric,Skew-symmetric and orthogonal matrices; Determinants; Eigenvalues and eigenvectors;Diagonalization ofmatrices;Cayley-HamiltonTheorem, andOrthogonaltransformation.

**UnitII: Sequencesandseries:(12lectures)**
Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series forexponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series,Parseval'stheorem.

**UnitIII:Calculus:(8lectures)**
Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions andtheirproperties;Applicationsofdefiniteintegralstoevaluatesurfaceareasand volumesofrevolutions.

**Unit IV:Calculus:(8lectures)**
Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; indeterminateformsand L'Hospital's rule;Maxima andminima.

**UnitV:MultivariableCalculus(Differentiation):(10lectures)**
Limit,continuity andpartialderivatives,directionalderivatives,totalderivative;Tangentplaneandnormal line; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, curl anddivergence.

**SuggestedText/ReferenceBooks**
(i) G.B.ThomasandR.L.Finney,CalculusandAnalyticgeometry,9thEdition,Pearson,Reprint,2002.
(ii) Erwinkreyszig,AdvancedEngineeringMathematics,9thEdition,JohnWiley&Sons,2006.
(iii) VeerarajanT.,EngineeringMathematicsforfirst year,TataMcGraw-Hill,NewDelhi,2008.
(iv) RamanaB.V.,HigherEngineeringMathematics,TataMcGrawHillNewDelhi,11th Reprint,2010.
(v) D.Poole,Linear Algebra: AModernIntroduction,2ndEdition,Brooks/Cole,2005.
(vi) N.P.BaliandManishGoyal,AtextbookofEngineeringMathematics,LaxmiPublications,Reprint,2008.
(vii) B.S.Grewal,HigherEngineeringMathematics,KhannaPublishers,36thEdition,2010.

**CourseOutcomes**
The objective of this course is to familiarize the prospective engineers with techniques in calculus,multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools atan intermediate to advanced level that will serve them well towards tackling more advanced level ofmathematicsandapplications thattheywouldfind useful intheir disciplines.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-101 | BasicElectricalEngineering | 3-1-0 | 4 |

**LearningObjectives:**
Tounderstandandanalyzebasicelectricandmagneticcircuits
Tostudytheworkingprinciplesofelectricalmachinesandpowerconverters.Tointro
ducethecomponents oflowvoltageelectricalinstallations.
**Detailedcontents:**
***Unit1:DCCircuits(8hours)***
Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws,analysis of simple circuits with dc excitation. Superposition, Thevenin, Norton and maximum powertransferTheorems.
***Unit2:ACCircuits(8hours)***
Representation of sinusoidal waveforms, peak and rms values, phasor representation,
realpower, reactive power, apparent power, power factor. Analysis of single-phase ac
circuitsconsisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance.
Three phasebalancedcircuits, voltageand current relationsin starand deltaconnections.
***Unit3:Transformers(8hours)***
Construction, working principle of transformer, ideal and practical transformer, equivalent circuit, lossesintransformers,regulationandefficiency.Auto-transformeranditscomparisonwithordinarytransformer.
***Unit4:ElectricalMachines(8hours)***
Generationofrotatingmagneticfields,Constructionandworkingofathree-phaseinduction
motor, Significance of torque-slip characteristic, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of dc motor.Constructionand workingof synchronous generators.
***Unit5:PowerConverters& ElectricalInstallations(8hours)***
DC-DC converters and AC-DC converters, Switches, Fuses, MCBs, Earthing and its types, ImportantCharacteristics for Batteries and battery backup. Elementary calculations for energy consumption, powerfactorimprovement.
**SuggestedText/ ReferenceBooks**
(i) D.P.KothariandI.J.Nagrath,"BasicElectricalEngineering",TataMcGrawHill,2010.
(ii) D.C.Kulshreshtha,"BasicElectricalEngineering",McGrawHill,2009.
(iii)L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University
Press,2011.
(iv) E.Hughes,"ElectricalandElectronicsTechnology",Pearson,2010.
(v) V.D.Toro,"ElectricalEngineeringFundamentals",PrenticeHallIndia,1989.
**CourseOutcomes**
Studentsareable to understandandanalyze basicelectricand magneticcircuits
Studentsareabletounderstandtheworkingprinciplesofelectrical machinesandpower converters.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-103 | IntroductiontoComputerSystems&InternetBasics | 3-0-0 | 3 |

**Objective:**Togivebasicknowledgeof ComputerHardware,Softwaresystems&internets

**Unit1.ComputerSystems**

OverviewofComputerSystems,EvolutionofComputerSystems,Generationsofcomputers,Characteristics of Computer: speed, storage, Accuracy, Categories of computer: Micro Computers, MiniComputers, Main Frames, Super Computers, Computer Organization: Central processing unit, ArithmeticandLogicUnit,ControlUnit,MemorySystem:Primarymemory,secondarymemoryandDataRepresentationinaComputerSystem.Numbersystem:decimal,Binary,Octal,Hexadecimalrepresentationandconversion

**Unit 2.ProgrammingLanguages&OperatingSystembasics**

Software Basics: Application software, System Software, Utility Software, Programming languages: Lowlevel languages, Machine language, Assembly language, Limitations of Low level languages, High Levellanguages, Translator, Assembler, Interpreter, Compiler, Operating System: Need of Operating System,Functionof OperatingSystem, Types of OperatingSystem

**Unit 3.Network Systems,Internet&Web**

Introduction to networking, Local and Wide Area Networks, communication media: wired and wireless,Network Topologies: Star, Ring, Bus, Networking devices: Switch, Hub, Bridge,Internet overview,Internet Architecture, The idea of hypertext and hyper media; how the browser works: MIME types, plug-insand helper applications; XML,XHTML,XSLTand theW3C, HostingandDomains:

**Unit 4**: **Hypertext Markup Language:** The anatomy of an HTML document; marking up for structureand style: ordered and unordered lists, Structuring content with HTML using natural divisions, Marquee,Anchor Tag, Email Link; embedding images and controlling appearance, table creation: Frames andNesting, iframes, forms, Semantic elements of HTML5, HTML5 Form elements, Media tagsin HTML5,HTML5DataStorage

**Unit5.ComputerSecurity**

SecurityThreats:Intruders,PasswordCracking,DifferenttypesofmaliciousSoftware:Virus,Worms,TrojanHorse, PreventionfrommaliciousSoftware:Antivirus(Introduction)

**TextBooks:**


1. Computer Fundamentals: P.K.Sinha,BPBpub.
2. Fundamentalsof ComputerScienceandProgrammingwithC:A.K.Sharma,DhanpatRai Pub.
3. UttamK.Roy,"WebTechnology",OxfordPublication


**ReferenceBooks:**


1.ComputingFundamentals&CProgramming: E. Balaguruswamy, TMH.FundamentalsofComputers:VRajaraman, PHI

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-153 | EngineeringGraphics &Design | 0-0-6 | 3 |

**LearningOutcomes:**
Engineering drawing is an effective language of engineers. It is the foundation block which strengthenstheengineeringandtechnologicalstructure.Moreover,it'sthetransmittinglinkbetweenideasandrealization.After learning the course the students should be able to understand conventions and themethodsofengineeringdrawingandinterpretengineeringdrawings,usingfundamentaltechnicalmathematics, constructbasic and intermediate geometric improve their visualization skills so that theycan apply these skills in developing new projects improve their technical communication skill in the formofcommunicativedrawings,comprehend thetheory ofprojectionsandacquirebasicknowledgeofcomputer aideddrafting**.**

**Module 1:IntroductiontoEngineering Drawing**
Principles of Engineering Graphics and their significance, usage of drawing instruments,lettering, Conic sections including the Rectangular Hyperbola (General method only);Cycloid,Epicycloid,HypocycloidandInvolute;Scales–Plain,DiagonalandDimensioning

**Module2:OrthographicProjections**
Principles of Orthographic Projections-Conventions - Projections of Points and lines inclinedtoboth planes;

**Module3:ProjectionsofSolids**
ProjectionsofplanesinclinedPlanes-AuxiliaryPlanes;ProjectionofRegularSolidscoveringthoseinclinedtoboththeplanes,AuxiliaryViews; Sectionofsuchsolids andthetrueshapeof thesection.

**Module4: SectionsandSectionalViewsofRightAngularSolids**
Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone; objects fromindustry and dwellings (foundation to slab only) Principles of Isometric projection – Isometric Scale,IsometricViews,Conventions;IsometricViewsoflines,Planes,SimpleandcompoundSolidsConversion of IsometricViews to Orthographic ViewsandVice-versa

**Module5:Overview ofComputerGraphics**,
Introduction to Computer Aided Drafting and CAD software [such as: The Menu System, Toolbars(Standard,Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs,Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line(where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.;IsometricViews oflines, Planes, Simple andcompound Solids];

**SuggestedText/ReferenceBooks:**
1. BhattN.D.,PanchalV.M.& IngleP.R.,(2014),EngineeringDrawing,CharotarPublishingHouse

2. Shah,M.B.&RanaB.C.(2008),EngineeringDrawingandComputerGraphics,PearsonEducation
3. AgrawalB.&Agrawal C.M.(2012), EngineeringGraphics,TMHPublication
4. Narayana,K.L. &PKannaiah (2008),TextbookonEngineeringDrawing, Scitech
5. Publishers(Correspondingset of)CADSoftwareTheoryand UserManuals

**CourseOutcomes**

All phases of manufacturing or construction require the conversion of new ideas and design concepts intothebasiclinelanguageofgraphics.Therefore,therearemanyareas(civil,mechanical,electrical,architectural and industrial) in which the skills of the CAD technicians play major roles in the design anddevelopmentofnewproductsorconstruction.Studentsprepareforactualworksituationsthroughpractical training in a new state-of-the-art computer designed CAD laboratory using engineering software.Thiscourse is designedto address:

- to prepare you to design a system, component, or process to meet desired needs within realisticconstraintssuchaseconomic,environmental,social,political,ethical,healthandsafety,manufacturability,andsustainability
- toprepareyoutocommunicateeffectively
- toprepareyoutousethetechniques,skills,andmodernengineeringtoolsnecessaryforengineeringpractice

Thestudentwilllearn:

Introductiontoengineeringdesignanditsplaceinsociety

- Exposuretothevisualaspectsofengineeringdesign
- Exposure to engineering graphics

standardsExposureto solid modelling

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**EngineeringYear/Semester:1st Year/1**
**st Semester**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| HSS-101 | English | 2-0-0 | 2 |

**Detailedcontents**

**1. VocabularyBuilding**

1.1 Theconcept ofWordFormation
1.2 Root wordsfromforeign languages andtheiruseinEnglish
1.3 Acquaintancewithprefixesandsuffixesfromforeignlanguagesin Englishtoformderivatives.
1.4 Synonyms,antonymsandstandardabbreviations.

**2. BasicWritingSkills**

2.1 SentenceStructures
2.2 Useofphrasesandclausesinsentences
2.3 Importanceofproperpunctuation
2.4 Creatingcoherence
2.5 Organizingprinciplesofparagraphsindocuments
2.6 Techniquesforwritingprecisely
*2.7* Jane Austen:*PrideandPrejudice(novel)*

**3. IdentifyingCommonErrorsinWriting**

3.1 Subject-verbagreement
3.2 Noun-pronounagreement
3.3 Misplacedmodifiers
3.4 Articles
3.5 Prepositions
3.6 Redundancies
3.7 Clichés

**4. NatureandStyleofsensible Writing**

4.1 Describing
4.2 Defining
4.3 Classifying
4.4 Providingexamplesorevidence
4.5 Writingintroductionandconclusion

**5. WritingPractices**

5.1 Comprehension
5.2 PrécisWriting
5.3 EssayWriting
5.4 CharlesDickens: *OliverTwist*(novel)

**6. OralCommunication**

**SuggestedReadings:**

(i) *Practical English Usage.* Michael Swan. OUP. 1995. (ii) *Remedial EnglishGrammar.*F.T.Wood.Macmillan.2007(iii)*OnWritingWell.*WilliamZinss

er.Harper Resource Book. 2001

(iv) *StudyWriting.*LizHamp-LyonsandBenHeasly.CambridgeUniversityPress.2006.
(v) *CommunicationSkills*.SanjayKumarandPushpLata.OxfordUniversityPress.2011.(vi)
*ExercisesinSpokenEnglish*.Parts.I-III.CIEFL,Hyderabad.OxfordUniversityPress

**CourseOutcomes**

Thestudentwillacquirebasicproficiencyin Englishincludingreadingandlisteningcomprehension,writingand speakingskills.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-151 | PhysicsLab | 0-0-2 | 1 |

**ListofExperiments:**

1) Tostudyresponse curveofa seriesLCRcircuit.
2) TodeterminethePlanck'sconstantusingLEDs.
3) TodeterminetheRydberg'sconstantofHydrogenatom.
4) TofindtherefractiveindexandCauchy'sconstantsofaprism.
5) Tofindthewavelengthoflight byNewton'sringsexperiment.
6) Todeterminethethicknessofathinwirebyinterference.
7) TodeterminethewavelengthofLASERusingdiffractiongrating.
8) Todeterminetheresolvingpowerofatelescope.
9) Tofindthenumericalapertureofanopticalfibercable.
10) TofindthewavelengthoflightusingMichelson'sinterferometer.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-151 | BasicElectricalEngineeringLab | 0-0-2 | 1 |

**ListofExperiments:**

1. Basicsafetyprecautions.Introductionanduseofmeasuringinstruments– voltmeter,ammeter,multi–meter, oscilloscope.Resistors,capacitorsand inductors.
2. Demonstrationofcut –outsectionsof machines.
3. Torquespeedcharacteristicofdcmotor.
4. Paralleloperationof single-phaseTransformer.
5. Opencircuit &short circuittest onsinglephasetransformer.
6. ToverifytheThevenin's&Norton'stheorem.
7. ToverifytheSuperpositiontheorem.
8. Tostudyfrequencyresponse ofseries&parallelRLCCircuit.
9. LoadtestonD.C. Shunt generator
10. Torque–speedcharacteristicsofthreephaseInductionmotor&directionreversalbychangeofphase sequence of connection.
11. ToplotfieldcurrentVsArmaturevoltagecharacteristicsofsynchronousgenerator.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| HSS-151 | EnglishLab | 0-0-2 | 1 |

1. Comprehension
2. Pronunciation,Intonation,Stress andRhythm
3. CommonEverydaySituations:ConversationsandDialoguescommunicationatWorkplace
4. Interviews
5. FormalPresentations

**SCHEME & SYLLABUS FROM-2020**
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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| MC-101 | EnvironmentalScience | 2-0-0 | 0 |

1. **THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:** Basic definitionsrelated to environment; Scope, vis-à-vis environmental science and environmental engineering; a uses ofenvironmentaldegradation,atmosphericcompositionandassociatedspheres,habitatandclimate;objective,goalsandprincipalsinvolvedinenvironmentaleducation,environmentalawareness,Environmentalethics, environmentalorganization andtheirinvolvement.

2. **NATURALRESOURCES:**Renewableandnon-renewableresources;forestresources,over-exploitation, and deforestation / afforestation; water resources, impact of over-utilization of surface andgroundwater,floods,drought,conflictsoverwater,dams;mineralresources:derelictionofmines,environmental effects of extracting and using mineral resources; Food resources, modern agriculture andits impact, problem associated with fertilizer and pesticide, water logging, salinity ; energy resources,renewable, non-renewable energy sources, solar energy, wind energy, hydro energy, biomass energy,geothermal energy, nuclear energy and its associated hazards; land as a resource, land degradation, maninducedlandslides,soilerosionand desertification.

3. **ECOSYSTEMS:**Conceptofanecosystem,structureandfunctionofanecosystem,producers,consumersand decomposers,energy flow intheecosystem, ecologicalsuccession, food chains,foodwebs and ecological pyramids; characteristic features, structure and function of the following ecosystem -forestecosystem, grasslandecosystemdesertecosystemand aquatic ecosystems.

4. **BIODIVERSITYANDITSCONSERVATION:**Bio-geographicalclassificationofIndia;biodiversityatglobal,nationalandlocallevels,Indiaasamega-diversitynation,hot-spotsofbiodiversity; value of biodiversity-consumptive use, productive use, social, ethical aesthetic and optionvalues;threatstobiodiversity;conservationofbiodiversity:in-situandex-situconservationofbiodiversity.

5. **ENVIRONMENTAL POLLUTION:** Causes, effects and control measures of air pollution, waterpollution, soil pollution, marine pollution, noise pollution, thermal pollution; solid waste management, e-wastemanagement;disastermanagement–floods,earthquake, cycloneandlandslides.

6. **SOCIALISSUESANDTHEENVIRONMENT:**Waterconservation,rainwaterharvesting,watershed management; climate change, global warming, acid rain, ozone layer depletion; EnvironmentalProtectionAct,Air(PreventionandControlofPollution)Act,Water(PreventionandControlofPollution)Act,Wildlife ProtectionAct, ForestConservation Act.

7. **HUMAN POPULATION AND THE ENVIRONMENT:** Population growth, population explosion – family welfare programmes; role of information technology in environment and human health; casestudies, Chipko movement, SardarSarovar dam, mining and quarrying in Udaipur, salinity and waterlogging in Punjab, HaryanaandRajasthan, Bhopal gastragedy, Chernobyl nucleardisaster, arsenicpollutionin ground water.

**TEXTBOOK**

Kaushik, Anubha, and Kaushik, C.P., "Perspectives in Environmental Studies", 4th Edition,NewAgeInternationalPublishers, 2004

**REFERENCEBOOKS**


1. Agarwal,K.C.,"EnvironmentalBiology",2ndEdition,NidhiPubl.Ltd.,Bikaner,2001.
2. BharuchaErach,"TheBiodiversityofIndia",2ndEdition,MapinPublishingPvt.Ltd.,2006.
3. BrunnerR.C.,"HazardousWasteIncineration",1st EditionMcGrawHill Inc.,1989.
4. ClarkR.S.,"MarinePollution",1stEditionClandersonPressOxford,1989
5. .Cunningham, W.P., Cooper, T.H. Gorhani, E. & Hepworth, M.T., Environmental Encyclopedia",2ndEdition,JaicoPubl.House, 2001.
6. De,A.K.,"EnvironmentalChemistry",2ndEdition,WileyEastern,1989
7. Jadhav,H.andBhosale,V.M.,"EnvironmentalProtectionandLaws",1stEdition,Himala ya Pub. House,Delhi,1995.
8. Mckinney,M.L.andSchocl.R.M.,"EnvironmentalScienceSystems&Solutions",2ndEdition,Webenh anced edition,1996.
9. RaoM.N.andDatta,A.K.,"WasteWaterTreatment",2ndEdition,Oxford&IBHPubl.Co.,1987.
10. SharmaB.K.,"EnvironmentalChemistry",2ndEdition,GoelPubl.House,Meerut,2001Trivedi R.K.andGoel,P.K.,"IntroductiontoAirPollution",2ndEdition,Techno-sciencePublications,1996.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-101 | Induction&NurturingHobbies | 0-0-2 | 1 |

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**LOGY**
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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-102 | Chemistry | 3-1-0 | 4 |

**Unit-IPHASERULE**

Terminology, Definition of phase rule, Derivation of phase rule equation, One component system ($H_2O$system and $CO_2$ system), two components system, Simple eutectic system (Pb – Ag), Pattinson's Process,congruentsystem(Zn–Mg), incongruentsystem(Na-Ksystem),Merits anddemeritsof phaserule.

**UNIT-IITHERMODYNAMICS**

Second law of thermodynamics, entropy change for reversible & irreversible processes, Entropychangeforidealgas,variationoffreeenergywithtemperature&pressure,Gibbs-Helmholtzequation,Clapeyron- Clausius equation & it's integrated form Thermodynamic functions: energy, entropy and freeenergy.Estimationsofentropy and freeenergies.Freeenergy andemf.Cellpotentials,theNernstequationand applications.

**UNIT-IIICORROSIONANDITSPREVENTION**

Definition, Types of corrosion: Dry, wet corrosion (rusting of iron), galvanic corrosion, differentialaeration corrosion, stress corrosion. Factors affecting corrosion, preventive measures (proper design,CathodicandAnodic protection,sacrificialprotectionandbarrierprotection),SoilCorrosion.

**UNIT-IVSPECTROSCOPICTECHNIQUESANDAPPLICATIONS**

Part-A:Principlesofspectroscopyandselectionrules.Electronicspectroscopy.Fluorescenceanditsapplications in medicine.Vibrational and rotational spectroscopy of diatomic molecules.Applications.Nuclearmagneticresonanceandmagneticresonanceimaging,surfacecharacterisation techniques.

**UNIT-VINTERMOLECULARFORCESANDPOTENTIALENERGYSURFACES**

Ionic, dipolar and van Der Waals interactions.Equations of state of real gases and critical phenomena,Potential energysurfaces of$H_3$,$H_2F$ and HCNandtrajectories onthese surfaces.

**UNIT-VIORGANICREACTIONSANDSYNTHESISOF ADRUGMOLECULE**

Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclizationandringopenings.Synthesis ofacommonlyused drugmolecule.

**UNIT-VIISTEREOCHEMISTRY**

Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations andsymmetryandchirality,enantiomers,diastereomers,opticalactivity,absoluteconfigurationsandconformational analysis. Isomerismin transitionalmetal
compounds

**Suggested TextBooks:**

(i) Universitychemistry,byB.H.Mahan
(ii) Chemistry:PrinciplesandApplications,byM.J.SienkoandR.A.Plane(iii)Fundamentalsof MolecularSpectroscopy, byC. N. Banwell
(iv)Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan(v)PhysicalChemistry, byP. W. Atkins
(vi)OrganicChemistry:
StructureandFunctionbyK.P.C.VolhardtandN.E.Schore,5thEditionhttp://bcs.whfreeman.com/vollhardtschore5e/default.asp

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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-104 | Mathematics-II | 3-1-0 | 4 |

**Unit I:BasicProbability:(12lectures)**
Probabilityspaces,conditionalprobability,independence;Discreterandomvariables,Independentrandomvariables,themultinomialdistribution,Poissonapproximationtothebinomialdistribution,infinite sequences of Bernoulli trials, sums of independent random variables; Expectation of DiscreteRandomVariables,Moments,Varianceofasum,Correlation coefficient,Chebyshev'sInequality.

**UnitII: ContinuousProbabilityDistributions:(6lectures)**
Continuousrandomvariablesandtheirproperties,distributionfunctionsanddensities,normal,exponentialand gamma densities.

**UnitIII:ComplexVariable–Differentiation:(14lectures)**
Differentiation, Cauchy-Riemann equations, analytic functions, harmonic functions, finding harmonicconjugate;elementaryanalyticfunctions(exponential,trigonometric,logarithm)Contourintegrals,Cauchy-Goursattheorem(without proof), CauchyIntegralformula(withoutproof).

**UnitIV:First orderordinarydifferential equations:(8lectures)**
Exact,linearandBernoulli'sequations,Euler'sequations,Equationsnotoffirstdegree:equationssolvablefor p, equations solvablefory, equationssolvablefor x andClairaut'stype.

**UnitV:Ordinarydifferential equationsofhigherorders:(10lectures)**
Second order linear differential equations with variable coefficients, method of variation of parameters,Cauchy-Euler equation; Power series solutions; Legendre polynomials, Bessel functions of the first kindandtheir properties.

**SuggestedText/ReferenceBooks**
(i) ErwinKreyszig,AdvancedEngineeringMathematics, 9thEdition,JohnWiley&Sons,2006.
(ii) P.G.Hoel,S.C.PortandC.J.Stone,IntroductiontoProbabilityTheory,UniversalBookStall,2003(Reprint).
(iii)S.Ross,AFirstCourseinProbability,6thEd.,PearsonEducationIndia,2002.
(iv) W.Feller,AnIntroductiontoProbabilityTheoryanditsApplications,Vol. 1,3rdEd.,Wiley,1968.
(v) N.P.BaliandManishGoyal,AtextbookofEngineeringMathematics,LaxmiPublications,Reprint,2010.
(vi) B.S.Grewal,HigherEngineeringMathematics,KhannaPublishers,35thEdition,2000.
(vii)E.A.Coddington,AnIntroductiontoOrdinaryDifferential Equations,PrenticeHall India,1995.
(viii) E.L.Ince,OrdinaryDifferentialEquations,Dover Publications,1958.

**CourseOutcomes**
The objective of this course is to familiarize the students with statistical techniques. It aims to equip thestudents with standard concepts and tools at an intermediate to advanced level that will serve them welltowardstacklingvarious problems inthe discipline.

**SCHEME & SYLLABUS FROM-2020**
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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-102 | Programmingfor ProblemSolving | 3-0-0 | 3 |

**Unit-1:BASICS OF PROGRAMMING AND OVERVIEW OF C PROGRAMMING:**
Programming Fundamental, Problem definition, Idea of Algorithm, steps to solve logical and numericalproblems, Representation of Algorithms: Flow charts/ Pseudocode with example, Types of programminglanguages,Translators,Fromalgorithmstoprograms;sourcecode,variablesandmemorylocation, IntroductiontoC,StructureofCprogram,Ccharacterset,IdentifierandKeywords,Datatypes,constants, variables, Declaration, Arithmetic expressions & precedence , statements, Symbolic constants,type conversion, Types of operators, Input and output functions in C, header files, common programmingerrors,ControlStatements,Sequencing, Selection, Conditionand iteration.
**Unit-2: ARRAYS AND STRING:** Declaring, Referencing and initializing arrays, array subscript, usingfor loop for sequential access, multi-dimensional array, String basics string library functions, assignmentandsubstring, concatenation, stringcomparison.

**Unit-3: FUNCTIONS AND POINTERS:** Definition of function, function prototype, Purpose of mainfunction, passing parameters, Scope of function, recursion, Call by value and reference, Types of storageclasses, Scope of variable: Global and local, static variables, Recursion.. Pointer variables, initializingpointers,pointer operators,pointer expressions, pointersand arrays,pointerandfunctions,

**Unit-4:STRUCTURES,UNIONS&RECURSION**
Defining a structure, Declaring structure variables, Structure initialization, Copying and ComparingStructure variables, Array of structures, Arrays within structure, nested structures, Unions. Recursion as adifferent way of solving problems. Example programs, such as Finding Factorial, Fibonacci series,Ackermanfunction etc.
**Unit-5: DYNAMIC MEMORY ALLOCATION AND FILE PROCESSING:** C's dynamic allocationfunctions. Streams and file types, opening and closing a data file, input and output operations, text modeversus binarymode, formattedinput outputoperationswithfiles,randomaccesstofiles.
**ReferenceBooks:-**
1. ProgramminginCbySchaumSeries,McGrawHillsPublishers, NewDelhi.
2. LetUsCbyYashwantKanetkar; BPBPublication,NewDelhi.
3. ExploringCbyYashwantKanetkar; BPBPublications,NewDelhi.
4. Application Programmingin CbyRS Salaria,Khanna BookPublishingCo. (P)Ltd., NewDelhi.
5. Programmingin CbyR Subburaj,Vikas PublishingHouse Pvt.Ltd.,Jangpura,NewDelhi.
6. ProgrammingwithCLanguagebyCBalaguruswami,TataMcGrawHill,NewDelhi.
7. ProgramminginCbyBP Mahapatra,KhannaPublishers, NewDelhi

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**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| HSS-102 | EffectiveTechnicalCommunication | 3-0-0 | 3 |

**Module 1:**
InformationDesignandDevelopment-Different kindsoftechnical documents, Informationdevelopmentlifecycle,Organizationstructures,factorsaffectinginformationanddocumentdesign,Strategiesfororganization,Information designandwritingfor print andforonlinemedia.

**Module 2:**
TechnicalWriting,GrammarandEditing-Technicalwritingprocess,formsof discourse, Writing drafts and revising, Collaborative writing, creating indexes, technical writing style andlanguage. Basics of grammar, study of advanced grammar, editing strategies to achieve appropriatetechnical style. Introduction to advanced technical communication, Usability, Hunan factors, Managingtechnicalcommunication projects,time estimation,Single sourcing,ocalization.

**Module 3:**
SelfDevelopment andAssessment-Selfassessment,Awareness,Perceptionand Attitudes,Valuesandbelief,Personalgoalsetting,careerplanning,Self-esteem.ManagingTime;Personal memory, Rapidreading, Takingnotes;Complexproblemsolving; Creativity

**Module 4:**
Communication and Technical Writing- Public speaking, Group discussion, Oral presentation, Interviews,Graphicpresentation, Presentationaids, PersonalityDevelopment. Writingreports,projectproposals,brochures,newsletters,technicalarticles,manuals,officialnotes,businesslett ers,memos,progress reports, minutesofmeetings, event report.

**Module 5:**
Ethics-Businessethics,Etiquettesinsocialandofficesettings,Email etiquettes, TelephoneEtiquettes,Engineeringethics,Managingtime,Roleandresponsibilityofengineer,Workcultureinjob s,Personal memory,Rapidreading,Takingnotes,Complexproblemsolving,Creativity.

**Text/ReferenceBooks:**
1.DavidF.BeerandDavidMcMurrey,GuidetowritingasanEngineer,JohnWilley.NewYork,20042.Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)3.ShivKhera, You CanWin, Macmillan Books, NewYork, 2003.
4.RamanSharma,Technical Communications, OxfordPublication,London,2004.
5.DaleJungk,AppliedWritingforTechnicians,McGrawHill,NewYork,2004.(ISBN:07828357-4)6.Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi 2002.7.Xebec,Presentation Book, TMHNew Delhi,2000. (ISBN0402213)

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-152 | Workshop/ManufacturingPractice | 0-0-4 | 2 |

**CourseObjectives:**

- Toteachstudentsthepracticesofworkshopmanagementandmaintenance.
- Tofamiliarizestudentswithworkshopmachinerylikedrills,lathes,weldingtorches,files,saws,hammers , etc.
- Toteachstudentstheneedtoeconomizematerialswhenmanagingaworkshop.
- Toteachstudentsthesafetymeasuresneededinaworkshopandhowtodealwithaccidentsatwork.
- Toteachstudent weldingand manufactureofselecteditems.
- Toteachstudentsthepracticeofplumbing.
- Toteachstudentsthebasicsofelectricalinstallations.

**Course Outcomes:** Workshop practice is the backbone of the real industrial environment which helps todevelop and enhance relevant technical hand skills required by the technician working in the variousengineering industries and workshops. Upon completion of this course, the students will gain knowledgeofthedifferent manufacturing processes andday to day industrialaswelldomestic lifewhich arecommonlyemployed intheindustry, tofabricate componentsusingdifferentmaterials.

**(A) FittingTrade:**

1. PreparationofT-ShapeWorkpieceasperthe givenspecifications.
2. PreparationofU-ShapeWorkpiecewhichcontains:Filing, Sawing,Drilling,Grinding.

**(B) Machineshop:**StudyofmachinetoolsinparticularLathemachine(differentparts,differentoperations,studyofcuttingtools)

1. Toobtainrequireddiameters(steps)onacylinder workpiecewiththegivenlengths.
2. Toobtaintherequireddiameters(taper)ona cylinderworkpiecewiththegivendimensions.

**(C) Carpentry:**StudyofCarpentryTools,Equipmentanddifferentjoints

1. Tomakea dovetaillapjoint.
2. Tomake a cross halflapjoint.

**(D) FoundryTrade:**Introductiontofoundry,Patterns,patternallowances,ingredientsof moldingsandand meltingfurnaces.Foundrytools and their purposes

1. Toprepareasandmold,usingthegivensinglepiecepattern.
2. Toprepareasand mold,usingthe givensplit piecepattern.

**(E) Welding:**Introduction,StudyofToolsandweldingEquipment (GasandArcwelding)

1. Tomakeasinglev-buttjoint,usingthegivenmildsteelpiecesandbyarcwelding.
2. Tomakea T-joint usingthegivenmildsteelpiecesandbyarcwelding.

**(F) Electrical and Electronics:** Introduction to House wiring, different types of cables. Types of powersupply,typesofmotors, Starters,distributionofpowersupply,typesofbulbs,partsoftubelight,Electrical wiringsymbols.

1. Twolampsconnectedinseries -measure andcheckthevoltageandcurrent usingmultimeter.
2. Twolampsconnectedinparallel-measureandcheckthevoltageandcurrent usingmultimeter.

**(G) CNCMachining:**TostudytheworkingprincipleofCNCmachining.

**ReferenceBooks:**

1. Mechanical Workshop PracticebyK CJohn, PHILearning
2. WorkshopTechnologyVol. 1and 2 byRaghuvanshiB.S. DhanpatRai&Sons 1998
3. WorkshopTechnologybyChapmanW.A.JandArnold E.Vivalowpriced student edition,1998

**SCHEME & SYLLABUS FROM-2020**
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**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-152 | ChemistryLab | 0-0-2 | 1 |

**ChemistryLaboratory**

Choiceof10-12experimentsfromthefollowing:

♣Determinationofsurfacetensionandviscosity
♣Thinlayerchromatography
♣Ionexchangecolumnforremoval ofhardnessof water
♣Determinationofchloridecontent ofwater
♣Colligativepropertiesusingfreezingpointdepression
♣Determinationoftherateconstantofa reaction
♣Determinationofcell constant andconductanceofsolutions
♣Potentiometry-determinationofredoxpotentialsand emfs
♣Synthesisofapolymer/drug
♣Saponification/acidvalueofoil
♣Chemical analysisofasalt
♣Latticestructuresandpackingofspheres
♣Modelsofpotential energysurfaces
♣Chemicaloscillations-Iodineclockreaction
♣Determinationofthepartitioncoefficientofasubstancebetweentwoimmisciblleliquids
♣Adsorptionofacetic acidbycharcoal
♣UseofthecapillaryviscosimeterstothedemonstrateoftheisoelectricpointasthepHofminimumviscosityfor gelatin solsand/orcoagulation ofthewhite partof egg.

LaboratoryOutcomes

- Thechemistrylaboratorycoursewillconsistofexperimentsillustratingtheprinciplesofchemistryrelevant to the studyofscience and engineering. The studentswilllearnto:
- Estimaterateconstantsofreactionsfromconcentrationofreactants/productsasafunctionoftime
- Measuremolecular/systempropertiessuchassurfacetension,viscosity,conductanceofsolutions,redoxpotentials,chloridecontentof water,etc.
- Synthesizeasmall drugmoleculeandanalysesasaltsample.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ESC-152 | Programmingfor ProblemSolvingLab | 0-0-2 | 1 |

**LISTOFEXPERIMENTS**

**(Students have to do at 3-4 programs from each section)SEQUENTIALCONTROLSTATEMENTS**

1 Writeaprogramto Print HELLO
2 Writea programto add twonumbers
3 Writeaprogramtocalculatesimpleinterest
4 Writeaprogramtocalculate averageofthreenumbers
5 Writea programtoswap two numbers
6 Writeaprogramtoillustratemixeddatatypes
7 Writeaprogramtocalculateareaandcircumferenceofcircle
8 Writeaprogramtoevaluateapolynomial expression
9 Writea programto add digitsof afourdigitnumber
10 Writeaprogramtocheckwhetherthepersonifeligible forvotingornot

**CONDITIONALCONTROLSTATEMENTS**

11 Writeaprogramtofindgreatestoftwonumbers
12 Writea programto findoutwhichtype oftriangleitis
13 Writeaprogramtofindoutgreatestofthree numbers
14 Writeaprogramtoevaluateperformanceofthestudent
15 Writeaprogramtomake abasic calculator

**LOOPCONTROLSTATEMENTS**

16 Writeaprogramtoprint Fibonacciup-tothegivenlimit
17 Writea programto findthesumof digitsof anumber
18 Writeaprogramtofindfactorialofanumber
19 Writeaprogramtoprinttableof anynumber
20 Writeprogramforprintingdifferentpyramidpattern

**ARRAYSANDSTRINGS**

21 Writea programto enterthe elementsina onedimensionalarray
22 Writea programto findthesumand average of five numbers
23 Writea programto sort thearrayelements
24 Writeaprogramtoenterthemarksof 50studentsancalculatetheaverage
25 Writea programto add2 matrix
26 Writeaprogramtomultiply2matrices
27 Writea programto calculate thelengthof string
28 Writea programto concatenate2 strings
29 Writea programtoreversethe string
30 Writea programto countthenumbers ofcharactersinastring

31 Writeaprogramthat convertslowercase characterstouppercase

32 Writea programwithoutusingpredefinedfunctionstocheckwhetherthestringispalindrome ornot

**FUNCTIONS&POINTERS**

33 Writeaprogramusingfunctiontofind thelargestofthreenumbers

34 Writea programusingfunctiontosumthedigits of a number

35 Writeaprogramtocalculatefactorial ofanumberusingrecursivefunction

36 Writeaprogramtoprint first nFibonacci usingrecursivefunction

37 Writea programtoillustrate theconceptofchain ofpointers

38 Writea programusingfunctiontoswap twonumbers usingcallbyreference

39 Writea programto calculatethearea andperimeterofcircleusingpointers

40 Writea programto copythecontents of onearrayintoanotherin thereverseorderusingpointers

**STRUCTURES**

41 Writeaprogramtoreadanemployeerecordusingstructureandprintit

42 Writeaprogramtopreparesalarychart ofemployee usingarrayofstructures

43 Writeaprogramtoprintthenameandpercentageof20students(arrayofstructuresandarrayswithinstructures).

44 Writeaprogramto demonstratestructurewithinstructure.

**FILEHANDLING**

45. Writea programto create,open, and closefiles.

46. Writeaprogramtodemonstratethepurposeofdifferentfileopeningmodes.

47. Writeaprogramto countthenumber of characters,spaces,tabs, newlinecharactersin afile.

48. Writeaprogramtoreceivestrings fromkeyboardandwritethemtoafile.

49. Writea programto copyafiletoanother.

50. Writeaprogramto readstrings froma file and displaythemon screen.

**SCHEME & SYLLABUS FROM-2020**
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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-102 | PeopleConnect | 0-0-2 | 1 |

**SCHEME & SYLLABUS FROM-2020**
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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| MC-102 | ConstitutionofIndia | 2-0-0 | 2 |

**Objective**:ConstitutionofIndiaisthelengthiestwrittenConstitutionintheworld.Cameintoexistenceas a result of the independence, the Constitution strikes a perfect balance between the State (allocation ofpowers) and a citizen within his/her individual capacity (providing the rights). This paper will emphasizeon some of the important provisions of the Constitution, giving an insight about the functioning of theStateandits essentialpillars.

**UNIT– 1**

- MakingandBasicstructureoftheConstitution
- SalientfeaturesoftheConstitution
- Citizenship

**UNIT– 2**

- FundamentalRightsofacitizen
- FundamentalDutiesofacitizen
- DirectivesprinciplesofStatepolicy

**UNIT– 3**

- UnionandtheExecutive(President,Vice-President,Judiciary)

**UNIT– 4**

- EmergencyProvisions

**UNIT– 5**

StateLiability

**SCHEME & SYLLABUS FROM-2020**
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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-201 | Mathematics– III(NumericalMethods) | 3-1-0 | 4 |

**UnitI:Matrices(10lectures)**
Inverseandrankofamatrix,rank-nullitytheorem;Systemoflinearequations;Symmetric,Skew-symmetric and orthogonal matrices; Determinants;Eigenvalues and eigenvectors; Diagonalization ofmatrices; Cayley-HamiltonTheorem, and Orthogonaltransformation.

**UnitII: Sequencesandseries:(12lectures)**
Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series forexponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series,Parseval'stheorem.

**UnitIII:Calculus:(8lectures)**
Evolutes and involutes; Evaluation of definite and improper integrals; Beta and Gamma functions andtheirproperties;Applicationsofdefiniteintegralstoevaluatesurfaceareasandvolumesofrevolutions.

**Unit IV:Calculus:(8lectures)**
Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems with remainders; indeterminateformsand L'Hospital's rule;Maxima andminima.

**UnitV:MultivariableCalculus(Differentiation):(10lectures)**
Limit,continuity andpartialderivatives,directionalderivatives,totalderivative;Tangentplaneandnormal line; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, curl anddivergence.

**SuggestedText/ReferenceBooks**
(i) G.B.ThomasandR.L.Finney,CalculusandAnalyticgeometry,9thEdition,Pearson,Reprint,2002.
(ii) Erwinkreyszig,AdvancedEngineeringMathematics,9thEdition,JohnWiley&Sons,2006.
(iii) VeerarajanT.,EngineeringMathematicsforfirst year,TataMcGraw-Hill,NewDelhi,2008.
(iv) RamanaB.V.,HigherEngineeringMathematics,TataMcGrawHillNewDelhi,11th Reprint,2010.
(v) D.Poole,LinearAlgebra: AModernIntroduction,2ndEdition,Brooks/Cole,2005.

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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ME-203C | FluidMechanics | 3-1-0 | 4 |

**UNIT-1:FLUIDPROPERTIESANDFLUIDSTATICS**

Concept of fluid and flow; ideal and real fluids; Continuum concept; properties of fluids; Newtonianand non-Newtonian fluids; Pascal's Law; hydrostatic equation; hydrostatic forces on plane and curvedsurfaces;stabilityof Floatingand submergedbodies;relativeequilibrium;Problems

**UNIT-2:FLUIDKINEMATICSANDDYNAMICS**

Eulerian and Lagrangian description of fluid flow; stream; streak and path lines; types of flows; flowrate and continuity equation; differential equation of Continuity; rotation; vorticity and circulation;stream and potential functions; Problems Concept of system and control volume; Euler's equation;Bernoulli's equation; venturimeter; pitot tubes; orifice meter; kinetic and momentum correction factors;Impulsemomentumrelationshipandits applications;Problems

**UNIT-3:VISCOUSFLOW**

Flow regimes and Reynolds's number; Relationship between shear stress and pressure gradient; uni-directional flow between stationary and moving parallel plates; Counter flow; laminar flow throughpipes

**UNIT-4:FLOWTHROUGHPIPES**

Friction loss in pipe flow; Darcy-Weisbach formula co-efficient of friction and friction factor: Majorand minor losses in pipes; hydraulic Gradient and total energy lines; series and parallel connection ofpipes; branchedpipes; Equivalent pipe;powertransmissionthrough pipes; Problems

**UNIT-5:BOUNDARYLAYERCONCEPT**

Displacement;momentum andenergy thickness;von-karmanmomentum integralequation; laminarand turbulent boundary layer flows; drag on a flat plate; boundary layer separation; Stream lined andbluffbodies;liftand dragona cylinderand an airfoil;Problems

**TEXTBOOKS:**Kumar,K.L.,"EngineeringFluidMechanics",EurasiaPublicationHouse,2002

**REFERENCEBOOKS:**


1. Kumar,D.S.,"FluidMechanicsandFluidPowerEngineering",SKKatariaandSons,1998
2. Wylie,E.B,StreeterVL;"FluidMechanics";McGrawHill1983
3. SomSKandBiswasG.,"IntroductiontoFluidMechanicsandFluidMachines",TataMcGrawHill,1998
4. BansalRK,"AText BookofFluidMechanics"Laxmi Publications
5. Agrawal,S.K."FluidMechanicsandMachinery",TataMcGrawHill.

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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ME-205C | EngineeringMechanics | 3-1-0 | 4 |

**UNIT-1:FORCESYSTEMS**

Basic concepts of space, time, mass, force, particle and rigid body; scalars and vectors; principle oftransmissibility; force classification; Representation of force in vector form; rectangular components oftwo-dimensional force systems; resultant of two dimensional and concurrent force systems. momentaboutapoint;Varignon'stheorem;Representationofmoment invectorform; couple.Numerical.

**UNIT-2:EQUILIBRIUM**

Equilibriumintwodimensions;Lame'sTheorem;systemisolationandthefree-body-diagram;modellingtheactionofforces;equilibriumconditions;Numerical.

**UNIT-3:PROPERTIESOF SURFACES/CROSSSECTIONS**

Centre of mass; determining the centre of gravity; centre of gravity of areas including compositesections; moments of inertia; MI of plane figures; parallel axis & perpendicular axis theorem; MI ofcompositefigures. Numerical.

**UNIT-4:RECTILINEARANDCURVILINEARMOTION**

Types of motion, definitions of displacement, distance, velocity, speed, acceleration Newton's laws ofmotion,Uniformand non-uniformmotionequationsofmotion,motionunder gravity.Numerical.

**UNIT-5:PROJECTILES**

Angle of projection, Trajectory, Range of projectile, Duration of flight, Path of Projectile, Greatestheight attained bya projectile. Numerical

**TEXTBOOKS**

Meriam,J.L."EngineeringMechanics",JohnWiley&Sons.
Beer, F.P. and Johnston, E.R. "Mechanics of Materials", Tata McGraw
HillShames,I.H."EngineeringMechanics",4thEdition,PearsonEducation,2003
Pytel,AandKiusalaas,J.Thomsom,"MechanicsofMaterials",Brooks &Cole,2003

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-201C | IntroductiontoCivil Engineering | 3-0-0 | 3 |

**UNIT I:** Evolution and history of Civil
Engineering.ClassificationanddomainsofCivilEngine
ering.
Surveying;Compasssurvey,chainsurvey,Introductionstomodernsurveyingequipment'sandtechniquessuch as EDM orDistometer,Totalstation,Remote sensing&GPS.

**UNIT II:** Basic building materials and constructions: Common building materials, properties, Bricks,limes,timbers,stones,asphalt,bitumen,tar,Foundations,Typesofbuildings,Masonary:brick&composite,plastering, walls, roofs, floors.

**UNIT III:**Concrete materials and technology: Concrete materials & their compositions, properties,cements,grades ofconcrete,admixtures, formwork, concretehandlinginfields.

**UNITIV:**Traffic&TransportationEngineering:Historyoftransportationengineering,Modesoftransportation, Classification of roads, road plans, traffic signs, traffic signals, road markings, traffic &parking surveys, street lights, road accidents, railway engineering, airport engineering and planning,airport components, zonings, obstructions.

**UNIT V:** Environmental & hydraulic Engineering: Water supply, waste water, irrigation & hydraulicstructures.

Geotechnical Engineering & soil mechanics: Soil constituents, water contents, void ratio, porosity, soilclassification,soilstabilization, soil exploration, bearingcapacity.

Books:

1. Buildingmaterials,S.C.Rangwala
2. BuildingConstruction,B.CPunmia
3. ConcreteTechnology,Neville&Brooks,Pearson
4. HighwayEngineering,S.K.Khanna,SoilMechanics,K.R.Arora

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-203C | BuildingMaterial&Construction | 3-0-0 | 3 |

**Unit I: Introduction**: Common building material, Mechanical properties of material, Comparison ofvarious mechanical properties. **Stones**: Common building stones, Requirement of a good building stones,Dressing and preservation of stones. **Bricks**: Manufacture of clay bricks, Classification and testing of claybricks,Problems ofefflorescence.

**UnitII:Lime**:Manufacture,Classificationoflime.**Timber**:Classificationandwoodbasedproductsoftimber, Defectsandtheirprevention,Factors effectingthestrengthoftimber.,Seasoningand preservationof timber. **Asphalt, Bitumen and Tar**: Terminology, Bituminous materials, Specification and usage**Cement**: Properties, Usesand types;manufacturingand materials,PlasteringandFormWork.

**Unit III: Introduction of Buildings and Foundations**: General Introduction of Buildings, Types ofBuildings, Components of Buildings, Design Loads, Introduction of Foundation, Types of Foundation,Function of Foundation, Essential Requirements of a good Foundation, Site Investigation and Sub-SoilExploration, Method of Site Exploration, Settlement of Foundation, Causes of Failures**of** Foundationsand RemedialMeasures

**Unit IV: Bricks Masonry and Composite Masonry**: Introduction of Brick Masonry, Types of bricks,Bonds in brick work, Supervision of brick work, Defects in brick masonry, Strengths of brick masonry,Introduction of Composite Masonry, Reinforced brick masonry, Stone composite masonry, Brick-stonecomposite masonry, Concrete block masonry, Hollow clay block masonry,Damp Proofing, Termiteproofingand FireProtection of Buildings.

**UnitV:Walls**:Typesofwalls,Introductionofcavitywalls,Generalfeaturesofcavitywalls,Construction of cavity walls, Introduction of partition walls, Brick partitions, Clay block partition walls,Concretepartitions, Glasspartitions.
**Floors and Roofs**: Introduction of a Floor, Components of a Floor, Materials for Construction, Selectionof Flooring Material, Cement Concrete Flooring, Brick Flooring, Marble flooring, Asphalt Flooring,Introductionof Roofs,Types of Roofs,TrussedRoofs,SteelRoofTrusses

**Books:**


1. BuildingConstruction,B.C.Punmia
2. ConstructionMaterials,S.C.Rangwala

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-251C | ComputerAidedCivilEngineeringDrawing | 0-0-2 | 1 |

**ListofExperiments:**

1. IntroductionandRefreshingtoAutoCAD(IntroductionofAutoCADandVariousCommands)
2. FundamentalLineDrawings(Fundamentallinedrawings&PracticeDrawings)
3. FoundationDrawings(VariousTypesofFoundationdrawings)
4. BrickMasonryDrawings (DrawingsofVariousTypesofBond ofBrickMasonry)
5. HousePlanningDrawing(PlanningandDrawingsofPlumbingandElectricalinall Floors)
6. HousePlanningDrawing(PlanningandDrawingsofDifferent Floors)
7. OfficeBuildingDrawing(PlanningandDrawingsofDifferentFloors)
8. TodesignanddrawaPrimaryHealthCentre
9. Todesignand drawa PrimarySchool
10. Todesignanddrawa RestHouse

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| BSC-251 | Mathematics– III(NumericalMethods) Lab | 0-0-2 | 1 |

**ListofExperiments:(UsingC++Software)**

1. BisectionMethod.
2. Newton RaphsonMethod.
3. Secant Method.
4. RegulaiFalsiMethod.
5. LUdecompositionMethod.
6. Gauss-JacobiMethod.
7. Gauss-SiedelMethod.
8. Lagrange InterpolationorNewtonInterpolation.
9. Simpson'srule.
10. TrapezoidalRule

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ME-256C | FluidMechanics Lab | 0-0-2 | 1 |

**ListofExperiments:**

1. Tostudytheconstructionaldetailsanddrawcharacteristicandconstantefficiencycurvesofa Peltonturbine
2. Tostudytheconstructionaldetails anddrawcharacteristicand constant efficiencycurvesofa Francisturbine
3. Tostudytheconstructionaldetailsanddrawcharacteristicandconstantefficiencycurvesofa Kaplanturbine
4. Tostudytheconstructionaldetailsanddrawcharacteristiccurveofcentrifugal pump
5. Tostudytheconstructionaldetailsanddrawcharacteristiccurve ofareciprocatingpump
6. Tostudytheconstructionaldetailsanddrawperformancecurveof gearoilpump
7. Tostudythe constructionaldetails anddeterminethe efficiencyof ahydraulic Ram
8. Tostudytheconstructionaldetailsofacentrifugal compressor
9. Tostudythe model ofhydropower plantanddrawit'slayout
10. Todeterminethevolumetricefficiencyofareciprocatingcompressor

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-201 | PersonalityDevelopment&Grooming | 0-0-2 | 1 |

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-202C | SoilMechanics &EngineeringGeology | 3-1-0 | 4 |

**Unit1:**
**GeneralGeology**
EngineeringGeology:Introduction;Formations of Rocks;Characterization; Weathering Processes, TypesofRocks, Fold andfaultinRock, PhysicalPropertiesof Minerals

**Unit2:**
**IntroductionofSoilEngineering:**
Soil and soil-mass constituents, water content, specific gravity, void ratio, porosity, degree of saturation,airvoidandaircontent,unitweights,densityindexetc.Inter-relationshipsoftheabove.Determinationof index properties of soil: water content, specific gravity, particle size distribution, consistency limits,void ratio and density index. Classification of soil for general engineering purposes: particle size and I.S.Classificationsystems.

**Unit3:**
**SoilPermeability**
Permeabilityofsoilanditsdeterminationinlaboratory.Fieldpumpingouttests,factorsaffectingpermeability,permeabilityof stratified soilmasses

**Unit4:**
**Stressinsoilmassand compactionofsoil**
Stresses in soil mass: total, effective and neutral pressure, calculation of stresses, influence of water tableoneffectivestress,quicksandphenomenon.SeepageandSeepagePressure,Principlesofsoilcompaction,laboratorycompactiontests;Proctor'stest Modified Proctortests

**Unit5:**
**Shearingstrengthofsoil**
shearingstrengthofsoil,parametersofshearstrength,Coulomb'sfailureenvelope,determinationofshearparameters byDirectShearBox.Tri-axial and unconfinedcompressiontestapparatuses

**SuggestedReadings:**
1. ParbinSingh-ATextBookof Engineering&General Geology-S.K.Kataria&sons
2. K.R. Arora-AtextBookof SoilMechanics
3. NChennaKesavulu-ATextbookof EngineeringGeology-Macmillan IndiaLtd.
4. M.T.MarutheshaReddy-ATextbookofAppliedEngineering Geology-NewAgeInternationalPublisher

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-204C | DisasterPreparedness&Planning | 3-0-0 | 3 |

**Unit 1:** Introduction - Concepts and definitions: disaster, hazard, vulnerability, risks- severity, frequencyanddetails,capacity, impact, prevention, mitigation).

**Unit2**:Disasters-
Disastersclassification;naturaldisasters(floods,draught,cyclones,volcanoes,earthquakes,tsunami,landslides, coastalerosion,soilerosion,forestfiresetc.);manmadedisasters(industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportationaccidents, terrorist strikes, etc.); hazard and vulnerability profile of India, mountain and coastal areas,ecologicalfragility.

**Unit3**:DisasterImpacts-Disasterimpacts(environmental,physical,social,ecological,economic,political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazardlocations; globalandnationaldisastertrends;climatechange andurban disasters.

**Unit 4:** Disaster Risk Reduction (DRR) - Disaster management cycle – its phases; prevention, mitigation,preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability andcapacity assessment; early warning systems, Post-disaster environmental response (water, sanitation, foodsafety,wastemanagement,diseasecontrol,security, communications);Rolesandresponsibilitiesofgovernment, community, local institutions, NGOs and other stakeholders; Policies and legislation fordisaster risk reduction, DRR programmes in India and the activities of National Disaster ManagementAuthority.

**Unit 5:** Disasters, Environment and Development - Factors affecting vulnerability such as impact ofdevelopmentalprojectsandenvironmentalmodifications(includingofdams,land-usechanges,urbanizationetc.),sustainableandenvironmentalfriendlyrecovery;reconstructionanddevelopmentmethods.

**Text/ReferenceBooks:**

1. http://ndma.gov.in/(HomepageofNationalDisasterManagementAuthority)
2. http://www.ndmindia.nic.in/(NationalDisastermanagementinIndia,MinistryofHomeAffairs).
3. PradeepSahni,2004, DisasterRiskReductioninSouthAsia,PrenticeHall.
4. SinghB.K.,2008,HandbookofDisasterManagement:Techniques&Guidelines,RajatPublication.
5. GhoshG.K.,2006,DisasterManagement,APHPublishingCorporation
6. DisasterMedicalSystemsGuidelines.EmergencyMedicalServicesAuthority,StateofCalifornia,EMS Ano.214,June2003
7. InterAgencyStandingCommittee(IASC)(Feb.2007).IASCGuidelinesonMental HealthandPsychosocial Supportin EmergencySettings.Geneva:IASC

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ME-204C | StrengthofMaterials | 3-1-0 | 4 |

**UNIT-1:SIMPLESTRESSESANDSTRAINS**
Resistance to deformation; Hook's law and stress-strain diagram; types of stresses; stresses and strainsin bars of varying sections; stresses in composite bars; lateral strain and Poisson's ratio; volumetricstrain,modulus ofrigidityand bulkmodulus;relationbetweenelasticconstants. Numerical

**UNIT-2:TORSIONOFCIRCULARSHAFTSANDREACTIONOFBEAMS**
Torsion formula of circular shaft, power transmission by shaft, types of beams and loads, reactionproduced on supports for beams with point load uniformly distributed load, uniformly varying load andcombinedloads. Numerical.

**UNIT-3:SHEARFORCE&BENDINGMOMENT**
Definitions:SFandBMdiagramsforcantilevers,simplysupportedbeamswithorwithoutoverhangandcalculation ofmax.BMandSFandpointofcontra-flexureunderi)concentratedloads,ii)uniformly distributed loads over wholes pan or part of it iii) combination of concentrated and uniformlydistributedloads

**UNIT-4:ANALYSISOFPERFECTFRAMES**
Types of frames, Assumptions made in finding out the forces in frames, Reactions of supports of aframe,Analysis offrame byMethodofJoint,Analysisofframes byMethodofSection.

**UNIT-5:MOHRCIRCLEOF STRESSES**
Mohr's circle of stress for a material under similar stresses in two mutually perpendicular plane,Mohr's circle of stress for a material under dissimilar stresses in two mutually perpendicular planeMohr's circle of stress for a material under similar stresses in two mutually perpendicular plane alongwith shear stresses acting on all the planes, Mohr's circle for a material under dissimilar stresses intwomutuallyperpendicularplane alongwith shearstressesactingon alltheplanes.Numerical

**TEXTBOOKS**
FerdinandPBeer&RusselEJohnston;MechanicsofMaterials‖,TataMcGrawHill;2009
**REFERENCEBOOKS:**
1. Hibbeler,R.C.,MechanicsofMaterials,PearsonEducation,2005
2. Ryder,GH., StrengthofMaterials,Macmillan,2001
3. SrinathLS,StrengthofMaterials,Macmillan,2001
4. Andrew/Kiusalaas,Jaan,MechanicsofMaterials‖,Thomson,2003

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-206C | Surveying&Geomatics | 3-1-0 | 4 |

**UnitI:IntroductiontoSurveying**:Basicprinciples,Conceptandpurposeofsurveying,Measurements& its Units, Instruments used for taking measurements Classification based on surveying instruments, etc.**Chain Surveying**: Introduction Advantages and Disadvantages, Direct and indirect ranging Offsets andRecordingof fieldnotes.**Compasssurveying**:Purpose,Use ofprismatic compass.

**UnitII:Levelling:**Definitionsofvarioustermsinlevelling.Differenttypesoflevelling,sourcesoferrors in levelling curvature and refraction corrections. Temporary adjustment of dumpy and tilting levels.Computation and adjustment of levels.Profile levelling; L-Section and cross-sections.Mid ordinate,Averageordinate,Trapezoidalrule, Simpsonsrule.
**Plane Table Surveying**: Purpose of plane table surveying, Equipment used in plane table survey, Settingofaplanetable,MethodsofplanetablesurveyingRadiationIntersectionTraversingResection,Conceptof Twopoint and Three point problems, Errors in plane table survey and precautions to control themTestingand adjustmentofplanetableand alidade.

**Unit III: Triangulation:** Merits and demerits of traversing, triangulation and trilateration. Grades oftriangulation,Strengthoffigure,fieldprocedureoftriangulation.Reconnaissanceandselectionoftriangulation stations.**AdjustmentofTriangulationFigures:**Adjustmentoflevels.Adjustmentoftriangulationsfigures,brac edquadrilateralTrianglewithcentral,station.Approximateandmethodofleast squaresforfigure adjustment,Trilateration.

**Unit IV:** Measurement of Distances, directions and elevations by different methods. Traversing.Verticalcontrol, Precise levelling,Trigonometriclevelling.**Contouring:**Characteristicsof contours,contourinterval, contour gradient, Methods of locating contours, uses of contour maps.**Measurement of Angles& Direction:** Different types of direction measuring instruments and their uses. Reference meridians,Bearing and azimuths, magnetic declination and its variation.Use and adjustment of surveyors andprismaticcompass Errors of measurementsand their adjustments.

**Unit V: Introduction to the use of Modern Surveying equipment and techniques such as**: EDM orDistomat,Total station,StudyanduseofDigitalPlanimeter,IntroductiontoremotesensingandGPS.

**TextBook:**

1. Surveying&LevellingbyB. C. Punmia.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-208C | EnvironmentalEngineering | 3-1-0 | 4 |

**Unit 1**: *Water:* -Sources of Water and quality issues, water quality requirement for different beneficialuses, Water quality standards, water quality indices, water safety plans, Water Supply systems, Need forplannedwatersupplyschemes,Waterdemandindustrialandagriculturalwaterrequirements,Components of water supply system; Transmission of water, Distribution system, Various valves used inW/Ssystems, servicereservoirs anddesign.
*WaterTreatment:*aeration,sedimentation,coagulationflocculation,filtration,disinfection,advancedtreatments like adsorption,ion exchange, membrane processes
**Unit 2**: *Sewage*- Domestic and Storm water, Quantity of Sewage, Sewage flow variations. Conveyance ofsewage- Sewers, shapes design parameters, operation and maintenance of sewers, Sewage pumping;Sewerage,Sewerappurtenances,Designofseweragesystems.Smallboresystems,StormWater-Quantification and design of Storm water; Sewage and Sullage, Pollution due to improper disposal ofsewage, National River cleaning plans, Wastewater treatment, aerobic and anaerobic treatment systems,suspended and attached growth systems, recycling of sewage – quality requirements for various purposes.**Unit 3**: *Air* - Composition and properties of air, Quantification of air pollutants, Monitoringof airpollutants, Air pollution- Occupational hazards, Urban air pollution automobile pollution, Chemistry ofcombustion, Automobile engines, quality of fuel, operating conditions and interrelationship. Air qualitystandards,Controlmeasures for Airpollution,constructionandlimitations
*Noise*-Basicconcept,measurementandvariouscontrolmethods.
**Module4:***Solidwaste management*-Municipalsolidwaste,Compositionand variouschemical andphysical parameters of MSW, MSW management: Collection, transport, treatment and disposal of MSW.SpecialMSW:wastefromcommercialestablishmentsandotherurbanareas,solidwastefromconstruction activities, biomedical wastes, Effects of solid waste on environment: effects on air, soil,recoveryandrecycle.Disposalmethods-Integratedsolidwastemanagement.Hazardouswaste:Typesandnature ofhazardous wasteasperthe HW Schedules ofregulatingauthorities.
**Module 5**: *Building Plumbing*-Introduction to various types of home plumbing systems for water supplyandwastewaterdisposal,highrisebuildingplumbing,Pressurereducingvalves,Breakpressuretanks, Storage tanks, Building drainage for high rise buildings, various kinds of fixtures andfittingsused.

**SuggestedReadings:**
1-WaterSupplybyS.K. Garg, Khanna PublishingCo.
2. EnvironmentalEngineeringbyPeavy,H.S.,RoweD.R.andTechobanoglous,McGrawHill,BookCompany.
3.ManualofWater SupplyandWaterTreatment,MinistryofUrbanDevelopment,Govt.ofIndia.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| HSS-202 | EngineeringEconomics&Management | 3-0-0 | 3 |

**Unit-1:IntroductiontoEconomics:**

Definitions, Nature, Scope, Difference between Microeconomics & Macroeconomics Theory of Demand& Supply; meaning, determinants, law of demand, law of supply, equilibrium between demand & supplyElasticity; elasticityof demand,priceelasticity,income elasticity,crosselasticity.

**Unit-2:TheoryofProduction**

productionfunction,meaning,factorsofproduction(meaning&characteristicsofLand,Labour,capital& entrepreneur), Law of variable proportions & law of returns to scale Cost; meaning, short run & longrun cost, fixed cost, variable cost, total cost, average cost, marginal cost, opportunity cost. Break evenanalysis; meaning, explanation, numerical

**Unit-3:Macro-EconomicIndicators**

Macro-Economic Indicators, Changes in the Gross Domestic Product (GDP), Gross National Product(GNP), Inflation, Employment & Unemployment Indicators, Currency Strength, Interest rates, CorporateProfits, Balance of Trade, Agricultural Production, Current Account balance, Foreign exchange, ForeignTrade, Industrial Production Index, Wholesale Price Index (WPI), Retail Price Index (RPI), ConsumerPriceIndex (CPI).

**Unit-4:IntroductiontoManagement**

Definitions, Nature, scope Management & administration, skill, types and roles of managers ManagementPrinciples;Scientificprinciples,Administrativeprinciples,Maslow'sHierarchyofneedstheory.

**Functions to Management:** Planning, Organizing, Staffing, Directing, Controlling ( meaning, nature andimportance) Organizational Structures; meaning, principles of organization, types-formal and informal,line,line&staff,matrix,hybrid(explanationwithmeritsanddemerits),spanofcontrol,departmentalization.

**Unit-5:Introduction toMarketing&ProductionManagement**

MarketingMix,conceptsofmarketing,demandforecastingandmethods,marketsegmentationIntroductionto FinanceManagement;meaning, scope,sources,functions

**Production Management: Definitions**, objectives, functions, plant layout-types & factors affecting it,plant location- factors affecting it. Introduction to Human Resource Management; definitions, objectivesofmanpower planning, process,sources ofrecruitment, processof selection

**ReferenceBooks:**


1. EngineeringEconomics,R.Paneerselvam,PHIpublication
2. Fundamentals ofManagement:EssentialConceptsandApplications,Pearson Education,Robbins S.P.andDecenzoDavidA.
3. Economics:Principlesof Economics,NGregoryMankiw,CengageLearning
4. PrinciplesandPracticesofManagement byL.M.Prasad
5. PrinciplesofManagementbyTripathyand Reddy

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-252C | SoilMechanics&EngineeringGeologyLab | 0-0-2 | 1 |

**ListofExperiments:**

1. PhysicalPropertiesofMinerals
2. PhysicalPropertiesofRocks
3. IdentificationofMineralsinHandSpecimen
4. IdentificationofRocksinHandSpecimen
5. DeterminationofC-ϕvaluesbydirectsheartest apparatus
6. Grainsizedistributionbysieving
7. DeterminationofwatercontentbyPycnometer
8. DeterminationofspecificgravitybyPycnometer

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| ME-254C | StrengthofMaterials Lab | 0-0-2 | 1 |

**ListofExperiments:**

1. ToperformtheBrinell HardnessTest
2. ToperformtheRockwell HardnessTest
3. TostudytheImpact TestingMachineandperformtheImpactTests(IZOD &CHARY)
4. TostudyUTM andTorsionTestingMachine
5. ToperformtheTensileTeston UTM
6. To performthe ShearTeston UTM
7. Toperformthetorsion teston TorsionTestingMachine
8. TodeterminetheMoment ofInertiaofaFlywheel about itsownaxisofrotation
9. Tostudythe ErichsenSheetMetalTestingMachineand Performthe ErichsenSheet MetalTest.
10. Toverifysupportreactionsfordifferent typesofloadsat differentlocationsonthebeam

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-254C | Surveying&GeomaticsLab | 0-0-2 | 1 |

**ListofExperiments:**

1. Todeterminethedifferenceinelevationoftwogivenpoints DumpyLevel withAl Stand
2. Profilelevelingandcrosssectioningofagivenroute.
3. Tomeasurethehorizontal anglebythemethodofreiterationandrepetition,theodolitetraversinganderroradjustment.
4. Topreparethecontourmap ofanareabythemethodofradiallines.
5. Determinationofelevationoftopoftower usingtheodolite
6. Planetablingbythe methodofradiationandintersection.
7. SolutionofThree-pointprobleminplane tabling
8. Settingout ofsimplecircularcurve byone theodoliteandbytwotheodolitemethod
9. Topreparethecontourmapofan areabythemethodofTotal Station.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-256C | EnvironmentalEngineeringLab | 0-0-2 | 1 |

**ListofExperiments:**

1. TodeterminethepHofthegivensampleof water.
2. Todeterminetheturbidityofthegivensampleofwater
3. TodetermineTotal Solidsofthegivenwatersample.
4. TodeterminetheTotal DissolvedSolidsofthegivenwatersample.
5. Tofindout conductivityofthegivenwatersample.
6. Todeterminehardnessofthegivenwatersample.
7. Tofindout chlorideofthegivenwatersample.
8. Todeterminealkalinityofthegivenwatersample.
9. Tofindout acidityofthegivenwater sample.
10. Todeterminehardnessofthegivenwatersample.
11. Todetermine theoptimumdose of alumbyJartest.
12. TostudyvariouswatersupplyFittings.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-202 | LifeSkills | 0-0-2 | 1 |

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-301C | Concrete Technology | 3-0-0 | 3 |

**Unit1:**
CementHydration:CementTypes,PasteMicro-structure;Workability;Durability;Factorsaffectingstrength of concrete. **Ingredients of concrete:** Cement: hydration of cement and its basic compounds,structureof hydratedcement, C-S-Hgel, heat of hydration,gelspaceratioand itssignificance.
**Aggregates:**types,physicalpropertiesandstandardmethodsfortheirdetermination.

**Unit2:**
**Concrete :** Grade of concrete, proportioning of ingredients, water content and its quality for concrete,water/cement ratio and its role, Properties of fresh concrete including workability, air content, Flowability, Segregation, Bleeding and Viscosity etc. _ Factors affecting, methods of determination Hardeningplasticityandfatigue;Creepandshrinkage;Freshconcretemodelling;Moisture/Ionicdiffusioninconcrete.

**Unit3:**
**Admixtureinconcrete:**Chemicalandmineraladmixtures,theirtypesanduses:waterreducers,accelerator, retarders, water-proofing plasticizers, super plasticizers, air-entraining agents. Use of fly ashandsilicafume in concrete,their properties andeffect.

**Unit4:**
Quality control; Concrete mix design; Types of concrete; Concrete production; Tests of concrete instructures; Failure criteria;Fracture mechanics;
**Concrete Handling in Field:** Batching, mixing, placing and transportation of concrete, equipment's formaterial handling, various methods their suitability and precautions. Compaction of concrete: methods &equipment's.Curingofconcrete:variousmethodstheirsuitability. Durabilityof concrete

**Unit5:**
**FabricationandErectionWork:**Fabricationof Structural steelatslopes andsites,Handling andtransportationofunitstobeerected,ErectionofFabricatedsteelstructures,Prefabricated/precastconstruction;relativeadvantages&disadvantageandvariousprecastunits&ErectionofPrecastReinforcedConcrete Structures

**SuggestedReadings:**
1. ConcreteTechnologybyNeville&Brooks, PearsonEducation.
2. Concrete:Microstructure,Properties&Materials byMehtaP.K,TataMcGrawHill.
3. Concrete Technology by M.S.Shetty, S.Chand&
Co.4.ConcretematerialsbyPopovics,
StandardPublishers

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-303C | GeotechnicalEngineering | 3-1-0 | 4 |

**Unit I:SoilExploration** :Planning for soil exploration, Spacing of boring, Depth of boring, SoilSampling,Sample disturbance, SplitSpoonSampler
**SoilBearingCapacity**:Ultimatesoilbearingcapacity,Terzaghi'stheory,Effectofgroundwatertableonbearingcapacity,Settlement offoundation,Constructionpracticestoavoiddifferentialsettlement

**UnitII:LateralEarthPressure:**Introduction,Typesofearthretainingstructures,Lateralearthpressures,EarthPressure atRest, EarthPressuretheories,Active andPassive Pressures
**Stability of Retaining Walls:** Stability considerations for gravity retaining walls, Coulombs theory VsRankins theory, Choice of appropriate theory, Numerical Problems based on lateral earth pressure andstabilityofretainingwalls

**Unit III: Slope Stability:** Infinite Slopes, Finite Slopes, Total Stress analysis for purely cohesive soil,Effect of tension cracks, Method of slices for a cohesive frictional soil, Effective Stress Analysis, Steadyseepage,Rapid drawdown.

**Unit IV: Shallow Foundation:** Introduction to Shallow Foundation, Types of foundations settlement,Elastic settlement based on the theory of elasticity, Elastic Settlement of foundations on saturated clay,ElasticSettlementof SandSoil,Typesof Shallowfoundation.
**Deep Foundation:** Introduction, Necessity, Classification of piles, Uses of Piles, Load carrying capacityofpiles, Negative skinfriction.
**Design of Pile Foundation**: Design of pile foundation, Construction of pile foundations, laterally loadedpiles(BatterPiles)

**Unit V: Well Foundations:** Introduction, Advantages of well foundations, Elements of well foundation,Design Aspects of well foundation, Grip length, Forces acting on well foundation, Terzaghi analysis, TiltsandShifts, Remedialmeasuresforrectification oftiltsand shifts
**Machine Foundation:** Natural frequency of machine foundation, Transmissibility, Transmitted force,MachinefoundationSpecialfeatures,DesignApproachformachinefoundation,VibrationIsolation, Properties of isolating materials, Construction Aspectsofmachinefoundations

**TextBooks:**1.SOILMECHANICSANDFOUNDATIONENGINEERINGbyK.RARORA,STANDARDPUBLISHERS &DISTRIBUTORS, 3rdEdition,(2011)

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNOLOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-305C | Hydrology&WaterResourceEngineering | 3-1-0 | 4 |

**UnitI:INTRODUCTIONTOWATERRESOURCESENGINEERING**

Need of water resources projects, Preliminary aspects of Environmental Impact Assessment of WaterResourcesProjects,Hydrologiccycle,scopeandapplication,hydro-metrology,hydrologicequation,hydrologicmodels, water resourcesengineering

**UnitII:PRECIPITATIONANDABSTRACTIONS**

Mechanismofprecipitation,typesandformsofprecipitation,measurementtechniques,raingaugenetwork, variability in precipitation, estimation of missing data, test for consistency of rainfall record,rainfall hyetograph, rainfall mass curve, areal average rainfall, intensity duration curves, evaporation,factors affecting evaporation, evaporimeters, estimation of evaporation, evapotranspiration, measurementofevapotranspiration, initial loss,infiltration andinfiltration indices.

**UnitIII:RUNOFFANDHYDROGRAPH**

Direct runoff and base flow; run off characteristics of streams, computation of runoff, rainfall-runoffrelationships, components of hydrograph and factors affecting shape of hydrograph, base flow separation,effectiverainfallhyetograph, unithydrographtheory.

**STREAM GAUGING AND DESIGN FLOOD:** Site selection for stream gauging, direct methods ofdischargemeasurements, computationof design flood.

**UnitIV:GROUNDWATERHYDROLOGY**

Occurrence, distribution of ground water, specific yield of aquifers, movement of groundwater, Darcy'slaw, permeability, safe yield of a basin, compressibility of aquifer, storage coefficient, specific storage,hydraulicsofwellsundersteady&introductiontounsteadyconditioninconfinedandunconfinedaquifers, yield of wells,pumpingand recuperationtests,types of tubewells.

**UnitV:FLOODROUTING**

Reservoir andchannelfloodroutingmethods.

**OPENCHANNELFLOW:**ChannelCharacteristicsandparameters,Uniformflow,Criticalflow,SpecificEnergyconcepts,GraduallyVariedFlows,RapidlyVariedflowwithspecialreferencetohydraulicjump.

**LISTOFRECOMMENDEDBOOKS:**


1. K.Subramanya,"EngineeringHydrology",TataMc-GrawHillPublishingCo.Ltd.,NewDelhi,1990.
2. AsawaG.L.,"IrrigationandwaterresourcesEngineering",NewAgeInternationalPublishers,New Delhi,2005.
3. Garg S.K., "Irrigation Engineering andHydraulicStructures", KhannaPublishers,New Delhi,1996.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-307C | HighwayEngineering | 3-1-0 | 4 |

**Unit 1**: Highway development and planning-Classification of roads, road development in India, Currentroadprojectsin India;highwayalignmentand projectpreparation.

**Unit 2**: Geometric design of highways-: Introduction; highway cross section elements; sight distance,designofhorizontal alignment; designofverticalalignment; designofintersections,problems

**Unit 3**: Traffic engineering & control- Traffic Characteristics, traffic engineering studies, traffic flow andcapacity, traffic regulation and control; design of road intersections; design of parking facilities; highwaylighting; problems

**Unit4**:Pavementmaterials-MaterialsusedinHighwayConstruction-Soils,Stoneaggregates,bituminous binders, bituminous paving mixes; Portland cement and cement concrete: desirable properties,tests,requirements for differenttypesof pavements. Problems

**Unit 5:** Design of pavements- Introduction; flexible pavements, factors affecting design and performance;stresses in flexible pavements; design of flexible pavements as per IRC; rigid pavements components andfunctions;factors affectingdesign andperformance

**ListofRecommendedBooks:**


1. TransportationEnggbyS.KSharma
2. HighwayEnggbyL.RKhadiyali
3. HighwayEnggbyJustoand Khanna

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNOLOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-309C | DesignofConcreteStructures | 3-1-0 | 4 |

**UnitI:FundamentalsofworkingStressMethod**:Conceptofreinforcedconcrete,Stressstraincharacteristics of concrete and steel reinforcement, Elastic theory, singly reinforced beam, Balancedsection,underreinforced section,overreinforcedsection,Analysisanddesignofsinglyreinforcedrectangularsection, doublyreinforced rectangularsectionandT-sections, Design ofonewayand two-wayslab as perIS-456

**Fundamentalsofultimatestrengththeory:**Curvedstressdistribution,Compressivestressblock,Simplified rectangular stress block as per Whitney's approach, Ultimate moment of resistance of singlyreinforcedsection

**UnitII:Introductiontolimitstatemethodofdesign**:Conceptsofprobabilityandreliability,Characteristicloads ,Characteristicstrength,Partialsafetyfactorsforloadsandmaterials,Introductiontolimit states of collapse in flexure, Stress strain relationship for concrete, Stress strain relationship for steel,DesignStressblockparameters,Determinationofneutralaxisdepth,Computationofmomentofresistance, Analysis and design of singly reinforced beam, doubly reinforced beam and T beam Sections**UnitIII:Shear,BondandTorsion**:LimitstateofCollapse-Shear,DevelopmentLength,Bond,anchorage,developmentlength andsplicing, LimitStateof Collapse-Torsion.

**LimitStateofServiceability:**Introduction,LimitstateofDeflection-Shorttermandlongterm,Controlofdeflection, Limitstate ofCracking

**Design of slabs:** Introduction to one way and two-way slab, Design of one-way slab, Design of two waysimply supported slab on the four edges with corners not held down and carrying u.d.l, Design of two wayslabsimplysupportedon the four edges withcornershelddownand carryingu.d.l

**UnitIV:Foundation:**Introduction,pressuredistributionbeneathfooting,IndianStandardcoderecommendation for design of footings, Design concepts of isolated and combined footing, Detaileddesignofisolated wallandcolumn footings

**Unit V: Axially Loaded Columns:** Introduction, types of columns, Assumptions in limit state of collapsein axial compression, Short Axially loaded member in axial compression, Short axially loaded columnwithminimumeccentricity,Compression members withhelicalreinforcement

**Books:**1.LIMITSTATEDESIGNOFREINFORCEDCONCRETE(IS456:2000)byDR.BCPUNMIA,ASHOKKUMARJAINANDARUNKUMARJAINT,LAXMIPUBLICATIONS,1st Edition,(2010)

2. REINFORCEDCONCRETEDESIGNbyPILLAIANDDMENON,MCGRAWHILLEDUCATION,2nd Edition, (2007)

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-351C | DesignofConcreteStructuresLab | 0-0-2 | 1 |

**ListofExperiments:**

1. Introductiontoconcretemixdesign
2. Designofone-waySlab
3. Designoftwo-waySlab
4. DesignofBeam
5. DesignofColumn
6. DesignofStair
7. DesignofSunshade
8. DesignofLintel
9. DesignofFoundation
10. Designofretainingwall.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-353C | GeotechnicalEngineeringLab | 0-0-2 | 1 |

**ListofExperiments:**

1. DeterminationofliquidlimitbyCasagrande'sapparatus.
2. Determinationofplasticlimit
3. Determinationofshrinkagelimit
4. Determinationoffielddensitybysandreplacementmethod
5. DeterminationofcompactionpropertiesbystandardProctorTestApparatus
6. Todeterminethecompressibilityparametersofsoilbyconsolidationtest
7. Todeterminethe permeabilityofsoilbyconstantandfallinghead methods.
8. TodeterminetheCBRofsoil.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-355C | HydraulicEngineeringLab | 0-0-2 | 1 |

**ListofExperiments:**

1. Viscousflowanalogy(Hele-Shawapparatus)forflownet.
2. Electrical analogyforflownet.
3. Studyofdevelopmentofboundarylayerover aflat plate.
4. StudyofMagnus effect usingwindtunnel
5. Studyof fluidflowarounda cylinder.
6. Studyof fluid flowarounda sphere.
7. Studyof hydraulicjump inopen channelflow.
8. Specificenergystudiesin anopen channelflow.
9. Studyofflowprofile over aspillway.
10. Study of sluice
    gates.TiltingFlume/AdjustableCh
    annel
11. Studyofcharacteristics ofPeltonWheel
    A) PeltonWheelTurbineTestRig(ClosedCircuitType)5H.P. Output
    B) OptionMiniatureModel (1H.P.output)
12. StudyofcharacteristicsofFrancisTurbine

A) FrancisTurbineTest Rig(ClosedCircuitType)5H.P.Output
B) OptionMiniatureModel (1H.P.output)
C) Studyofcentrifugal pumptestrig.
D) Studyofreciprocatingpumptest rig.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-357C | HighwayEngineeringLab | 0-0-2 | 1 |

**ListofExperiments:**

1. Todeterminetheimpactvalue ofaggregatesample.
2. Todeterminethecrushingvalue ofaggregate sample.
3. Todeterminetheflakiness andelongationindexofaggregatesample.
4. ToperformLosAngelesAbrasiontest on aggregatesample.
5. Todeterminethe CBRvalueof agiven soilsample.
6. Toperformtrafficsurvey&determinetrafficvolume&capacity.
7. Toperformspot speedstudy.
8. Tocarryoutthegrainsizeanalysisofcourseaggregates&fineaggregates
   (A) SieveShaker
   (B) BrassSieve
   (C) G.I.Sieve
9. Toperformpenetrationtest onbitumensample.
   A. BitumenPenetrometer –HandOperated
   B. BitumenPenetrometer–Electrical -Sameasabovewithelectricalarrangement.
10. Todeterminethesofteningpointofbitumensample
    A. HandOperated
    B. ElectricallyOperated
11. Todeterminethespecificgravityandwaterabsorptionofaggregatesample
    A. ThermostaticallycontrolledOven
    B. WireBasket
    C. DigitalWeighingBalance,10kgcapacity
12. Todeterminetheductilityvalueof abitumensample.
13. Todeterminethestripingvalueofcoarseaggregatecoatedwithbitumen

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-301 | Leadership&EntrepreneurialDevelopment | 0-0-2 | 1 |

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/5**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-311C | Repair&RehabilitationofStructures | 3-0-0 | 3 |

**UnitI**MaintenanceandRepairStrategiesMaintenance,RepairandRehabilitation,FacetsofMaintenance,importanceofMaintenance,VariousaspectsofInspection,Assessmentprocedureforevaluatinga damaged structure, causesof deterioration;

**Unit II** Strength and Durability Of Concrete- Quality assurance for concrete – Strength, Durability andThermal properties, of concrete – Cracks, different types, causes – Effects due to climate, temperature,Sustainedelevatedtemperature, Corrosion – Effectsofcoverthickness;

**Unit III** Special Concretes- Polymer concrete, Sulphur infiltrated concrete, Fibre reinforced concrete,Highstrengthconcrete,Highperformanceconcrete,Vacuumconcrete,Self-compactingconcrete,Geopolymer concrete,Reactivepowder concrete,Concrete madewithindustrial wastes;

**Unit IV** Techniques for Repair and Protection Methods- Non-destructive Testing Techniques, Epoxyinjection,Shoring,Underpinning,Corrosionprotectiontechniques–Corrosioninhibitors,Corrosionresistantsteels, Coatings toreinforcement, cathodicprotection;

**Unit V** Repair, Rehabilitation and Retrofitting of Structures- Evaluation of root causes; Underpinning &shoring;somesimplesystemsofrehabilitation of structures;Guniting,shotcreting;Non-Destructivetestingsystems;Useof external plates,carbon fibrewrappingandcarboncomposites inrepairs. Strengthening of Structural elements, Repair of structures distressed due to corrosion, fire, Leakage,earthquake– DemolitionTechniques–Engineereddemolition methods– Casestudies.

**SCHEME & SYLLABUS FROM-2020 BATCHSCHOOLOFENGINEERING&TECHNO LOGY**
**Department of Civil EngineeringYear/Semester:3rdYear/5**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-313C | ConstructionEquipment's&Automation | 3-0-0 | 3 |

**Unit I**
Conventional constructionmethodsVs Mechanizedmethodsandadvantages oflatter.

**Unit II**
EquipmentforEarthmoving,Dewatering;Concretemixing,transporting&placing; plasteringmachines.

**Unit III**
Prestressingjacksandgroutingequipment;Cranes,Hoistsandotherequipment forlifting.

**UnitIV**
Equipmentfortransportationofmaterials.

**Unit V**
EquipmentProductivities;UseofDronesforspreadoutsites;Useofrobotsforrepetitiveactivities.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/5**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-315C | BuildingConstructionPractice | 3-0-0 | 3 |

**Unit I**

Specifications,detailsandsequenceofactivitiesandconstructionco-ordination–SiteClearance–Marking–Earthwork.Masonry–stone masonry– Bondin masonry-concretehollowblockmasonry.

**Unit II**

Flooring–dampproofcourses–constructionjoints–movementandexpansionjoints–pre-castpavements.

**Unit III**

Buildingfoundations –basements–temporaryshed–centeringandshuttering–slipforms–scaffoldings –de-shutteringforms–Fabricationanderectionofsteeltrusses–frames–braceddomes–layingbrick – –weatherandwaterproof–rooffinishes–acousticandfireprotection;

**UnitIV**

Sub Structure Construction- Techniques of Box jacking – Pipe Jacking -under water construction ofdiaphragm walls and basement-Tunnelling techniques – Piling techniques - well and caisson - sinkingcofferdam - cable anchoring and grouting-driving diaphragm walls, sheet piles - shoring for deep cutting -well points-Dewateringand standbyPlantequipmentfor undergroundopen excavation;

**Unit V**

Super Structure Construction- Launching girders, bridge decks, off shore platforms – special forms forshells - techniques for heavy decks – in-situ pre-stressing in high rise structures, Material handling - erectinglightweightcomponentsontallstructures-SupportstructureforheavyEquipmentandconveyors-Erectionof articulatedstructures,braced domes andspace decks.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-302C | SpecificationEstimation&Costing | 3-1-0 | 4 |

**Unit I**

**ESTIMATE:** Methods of estimating, Deductions for openings, Building estimate by long wall-short wallmethodand centreline method, Arch masonrycalculations

**Unit II**

**ESTIMATE OF BUILDINGS:** Estimate of single room with varandah, estimate of double room withvarandah, estimate of masonry platform, estimate of masonry tank, estimate of hexagonal room, estimateofseptic tank, estimate of roads and canals

**Unit III**

**SPECIFICATIONS:** Specification of roads, Specification of various building parameters, Specificationofindustries, Specificationof earthwork

**UnitIV**

**R.C.C WORKS AND STRUCTURES:** R.C.C works, Standard hooks and cranks of reinforcement bars,Estimate of R.C.C slab, Estimate of R.C.C column, Estimate of R.C.C beam, Estimate of R.C.C footing,Estimateof R.C.Cretainingwall

**Unit V**

**RATEANALYSIS:**Preparing analysisofrates,Analysisofratesforcementconcretefoundation,Analysis of rates for Earthwork in excavation with a concept of lead and lift, Analysis of rates for RCC inroof slab, Analysis of rates for Terrazzo and marble Flooring, Analysis of rates for Brick masonry incement mortar

**TextBooks:**

1. ESTIMATING AND COSTING IN CIVIL ENGINEERING by B.N .DUTTA, UBS PUBLISHERS'DISTRIBUTORS(P)LTD.-NEW DELHI, 26th Edition,(2013)

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-304C | StructuralAnalysis–I | 3-1-0 | 4 |

**UnitI:BasicIntroductoryConcepts**

StructuralSystems- Equilibrium andcompatibility- StabilityandIndeterminateness- TypesofLoadings -Freebodydiagram.

**AnalysisofForcesinStaticallyDeterminesStructures**

Analysis Trusses (Including compound trusses), Beams and Frames (Including internal hinges) – AnalysisofBeams and Frames (Includinginternalhinges)

**UnitII: AnalysisofSpaceTrussesUsingTensionCoefficientMethod.**
**IntroductiontoForce(Flexibility)AndDisplacement(Stiffness)MethodofAnalysis**

**Unit III:AnalysisforMovingLoads**

Influencelinesfordeterminatebeamsandtrusses-Criteriaformaximaofinternalforcesforbeamsandtrusses.

**UnitIV:DisplacementofStaticallyDetermineStructures**

Determinationofslopeanddeflectionsofbeamsusingsuccessiveintegrationandconjugate Beammethods– Determinationofdeflectionoftrussesusingvirtual workmethod–Williot MohrDiagram

**UnitV:ANALYSISOFINDETERMINATETRUSSES**

Staticallyindeterminatestructures–ForceandDisplacementmethodofanalysis-Analysisbysuperposition– Selectionof redundantrestraints–Methodofconsistentdeformations

**BOOKSRECOMMENDED**

1. GuptaSPandPanditGS,“TheoryofStructures”Volume1and2,TataMcGrawHill,NewDelhi,1999
2. Vaidyanatnan, R and PerumalP “StructuralAnalysis”,Vol– I &II, 3rd edition, LaxmiPublication,New Delhi,2007
3. NegiLSandJangidRS,“Structural Analysis”,TataMcGrawHill,NewDelhi,1999
4. Utku,S,Norris,CHandWilbur,JB“elementaryStructural Analysis”,McGraHill,NY,USA.,1991
5. HibblerRC,“StructuralAnalysis”,6thedition,PrenticeHall,NJ,USA,2006

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-306C | DesignofSteelStructures | 3-1-0 | 4 |

**Unit1:PlasticAnalysis:**
Plasticanalysisofsteelstructures,staticandmechanismmethodofanalysis,shapefactor.ClassificationofCrossSections:AsperIS800-2007Plastic,compact,semicompact,slendersections,theircharacteristicsincludingmoment-rotation.

**Unit2:Connections:**
Riveted Connection, Types of bolts, load transfer mechanism, Design of bolted and welded connectionsunderaxialand eccentricloadings.
**Introduction of Welded Connection:** Introduction, Types of welded joints, Design of welded jointsubjected to axial loads, Design of welded joints subjected to eccentric loads, Design of simple, semi-rigidand rigid connections

**Unit3: CompressionMember**:
Columnbucklingcurves,Designofcompressionmember;Axiallyloadedbuiltupcolumns,designoflacingsand battens.
Beams:Designofbeams:simpleandcompoundsections,laterallysupportedandunsupportedbeamdesign,Web buckling, webcrippling,lateraltorsionalbuckling.
**TensionMembers:**Designstrength ingross sectionyielding, netsectionruptureand blockshear.Designofaxiallyloadedtension members

**Unit4: Designofplategirder:**
Design of welded and bolted sections.Connections for flange plate to flange angles and flange angles toweb, etc.Design of welded connections.Web and flange splicing. Horizontal, Intermediate and Bearingstiffeners.Design of gantrygirder.

**Unit 5: ColumnBases**:
Designofcolumnbases,Slabbase,gussetedbaseforaxialandeccentriccompressiveload.
Watertanks:circulartankswithsegmentalbottoms,rectangulartanks,pressedsteeltanks,designofstaging.

**ReferenceBooks:**
1-DesignofSteelStructuresbyN.Subramanian,OxfordUniversityPress.
2. Limit state Design of Steel Structures: S K Duggal, TMH publication3-
DesignofSteelStructuresbyS.Bhavikatti,I.K.InternationalPvt.Ltd.4-
Design ofSteelStructuresbyV.L. Shah,StructuresPublications.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-308C | OpenChannel Flow | 3-0-0 | 3 |

**Unit I**

Analyzeforunsteadyflowsin openchannels; Derivation of1-Dand2-Dshallowwaterflowequations.

**Unit II**

Considerationfornonhydrostaticpressuredistribution;Basicsofnumericalmethods:Finite-DifferenceandFinite ElementMethods.

**Unit III**

LatestshockcapturingFiniteVolumemethodsforsolving1-Dand2-Dshallowwaterflowequations;Dambreakflow.

**UnitIV**

Floodroutinginlargechannelnetworks,Floodroutingincompoundchannels;Floodroutinginchannelswithflood plains.

**Unit V**

Surfaceirrigationflowmodelling.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-354C | StructuralAnalysis– ILab | 0-0-2 | 1 |

**ListofExperiments:**

1. DeterminationofShearforceforsimplysupportedbeams.
2. DeterminationofBendingMomentforsimplysupportedbeams
3. DeterminationofSlopeofcontinuationbeams.
4. DeterminationofDeflectionofcontinuousbeams.
5. Determinationofdeflectionofpin-jointedtrusses.
6. Determinationofreactionofportalframes
7. Determinationofdeflectedshapeofportalframes.
8. Determinationofinfluencelinedeterminatebeams.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-358C | Minor Project | 0-0-4 | 2 |

To set the objectives, deliverables, work plan, logistics planning and milestones with discernible outputsandthen to demonstratethefeasibilitythrough someinitialwork.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-302 | ProblemSolvingSkills | 0-0-2 | 1 |

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-310C | ConstructionProjectManagement | 3-0-0 | 3 |

**Unit I**

**Construction:** Agenciesinvolvedandtheirmethodsofexecution,Introductiontoconstructionmanagement,UniquefeaturesofConstructionmanagement,StagesinConstruction,DescriptionofContract, Contract document, Contractual relationships, Bid and award process, Types of constructioncontracts, Phases of a project, Construction project planning- Stages of project planning, Pre-tender, posttenderplanning, Schedulingand Controlling

**Unit II**

**Techniquesofplanning:** Introductionanddevelopmentofbarcharts,Shortcomingsofbarcharts,Developmentofpertnetwork,Developmentofnetwork,Numberingtheevents,Modesofnetworkconstruction,Stepsinnetworkdevelopment, WorkBreakdown structure, Hierarchies

**Unit III**

**PERT:** Determining three-time estimates, Slack computations, Use of PERT, Time estimates, Frequencydistribution,Mean,varianceandstandarddeviation, Probabilitydistribution,Betadistribution

**CPM:** Calendaring Networks, Activity time estimate, Computation of Te and Tl, Float, Critical path,Projectcost, Optimumduration,Costoptimization.

**UnitIV**

**Resource Scheduling:** Process Updating, Data required for updating, Steps in the process of updating,ResourceAllocation, Resource Smoothingand Levelling

**Unit V**

**ConstructionEquipmentandSafety:** Excavators,Backhoeloaders,Cranes,Otherconstructionequipment's, Quality assurance and Quality Control, Quality and Contractor selection, Safety ProgramDevelopment,Accident/incidentinvestigation,Safetyand healthtraining,Need oftraining

**Books:**

1. PROJECTPLANNINGANDCONTROLWITHPERTANDCPMbyB.C.PUNMIAANDK.K.KHANDELWAL,LAKSHMIPUBLICATIONS, 4th Edition,(2012)
2. CONSTRUCTIONMANAGEMENTFUNDAMENTALSbyYKRAGKNUTSON,CLIFFORDJ.SCHEXNAYDER, CHRISTINE FIORI, RICHARD E. MAYO, TATA MCGRAW HILL, 2NDEDITION(2011),MCGRAW HILLEDUCATION, 2nd Edition,(2011)

**SCHEME & SYLLABUS FROM-2020 BATCHSCHOOLOFENGINEERING&TECHNO LOGY**
**Department of Civil EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-314C | ConstructionProductivity | 3-0-0 | 3 |

**Unit I**

DefinitionofProductivity,ImpactofproductivitiesonconstructiondurationandcostsMeasuringproductivitiesof construction equipment.

**Unit II**

StaffandLabourandtypicalbenchmarksforthesame;ProductivityanalysisfromDailyProgressReports.

**UnitIII**

LeanConstructionconceptsofValueAddingactivities,Non-ValueAddingActivitiesandNon-ValueAddingbutNecessaryActivities.

**UnitIV**

ProductivitymeasurementsbyspecialLeanConstruction-orientedfieldmethodssuchasWorkSampling,Takttime analysis, Foreman DelaySurveys.

**Unit V**

ProductivityimprovementmeasuressuchasValueStreamMapping,Location-BasedmanagementSystems,5S,goodHousekeeping, etc.;use ofspecialistsoftwaresuchasVicoforproductivitystudies.

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**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-318C | ConstructionProjectPlanning&System | 3-0-0 | 3 |

**Unit I**

Definition of Projects; Stages of project planning: pretender planning, pre-construction planning, detailedconstruction planning, role of client and contractor, level of detail, work break-down structure, estimatingdurations,sequence of activities,activityutilitydata.

Techniques of planning- Bar charts, Gantt Charts. Networks: basic terminology, types of precedencerelationships,preparationofCPMnetworks:activityonlinkandactivityonnoderepresentation,computationoffloatvalues,criticalandsemi criticalpaths,calendaringnetworks.

**Unit II**

PERT-

AssumptionsunderlyingPERTanalysis,determiningthreetimeestimates,analysis,slackcomputations,calculation of probabilityof completion.

Allocation of Resources- materials, equipment, staff, labour and finance; resource levelling and optimalschedules; Project organisation, documentation and reporting systems.Control & monitoring; TemporaryStructuresin Construction;ConstructionMethods forvarioustypes ofStructures.

**Unit III**

Importance of Contracts Management; Planning and organizing construction site and resources- Site: sitelayout including enabling structures, developing site organization, Documentation at site; Manpower:planning, organizing, staffing, motivation; Materials: concepts of planning, procurement and inventorycontrol.

**UnitIV**

Project Monitoring & Control- Supervision, record keeping, periodic progress reports, periodical progressmeetings. Updating of plans: purpose, frequency and methods of updating.Common causes of time andcost overruns and corrective measures.Basics of Modern Project management systems such as LeanConstruction; Useof BuildingInformation Modelling(BIM)inproject management.

**Unit V**

Quality control: concept of quality, quality of constructed structure, use of manuals and checklists forquality control, role of inspection, basics of statistical quality control. Safety, Health and Environment onproject sites: accidents; their causes, effects and preventive measures, costs of accidents, occupationalhealthproblems in construction,organizingfor safetyand health.

**TextBook:**

1. Project Planning&ControlwithPERT&CPMbyB.C. Punmia.

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**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-320C | TrafficPlanning&Management | 3-0-0 | 3 |

**Unit I**

**Transport planning process systems** : Approach to transport planning, Stages in transport planning survey and analysis of existing conditions, Forecast analysis of future conditions and plan synthesis difficulties in the transport planning process, Transportation survey, Type of surveys, Inventory of transport facilities, Inventory of land use and economic activities, Expansion of data from samples

**Unit II**

**Trip generation** : Trip purpose, Factors governing trip generation and attraction rates, Multiple linear regression analysis, Category analysis

**Trip distribution** : Methods of trip distribution, Uniform constant factor method, Average factor method, Fratar method, Furness method, Gravity model, Tanners model, Opportunity model

**Unit III**

**Traffic Assignment** : Assignment technique, Capacity restraint assignment, Diversion curves

**Modal split** : Factors affecting modal split, Modal split in the transport planning process, Recent developments in modal split analysis

**Unit IV**

**Evaluation** : Need for Evaluation, Several plans to be formulated, Consideration in evaluation, Economic evaluation

**Land use Transport models** : Selection of land use transport models, Lowry Derivative Models, Garin–Lowry Model

**Unit V**

**Transport planning for small, medium and large cities** : Difficulties in transport planning for small and medium cities, Quick response techniques, Public transport in cities, Planning for public transport, Fares and subsidies

**Intermediate public transport in Indian cities** : Type of IPT vehicles in India, Characteristics of IPT modes

**Unit VI**

**Computer application in transport planning** : Transport planning and computer applications, Computer applications in public transport systems simulation, Programme packages, Use of information technology in transportation

**Text Books:**

1. TRAFFIC ENGINEERING AND TRANSPORT PLANNING by L.R. KADIYALI, KHANNA PUBLISHERS, 1st Edition, (2007)

2. HIGHWAY ENGINEERING by S,K, KHANNA AND C,E,J JUSTO, NEM CHAND BROTHERS, 1st Edition,

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**Department of Civil EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-316C | TransportationEconomics | 3-0-0 | 3 |

**Unit I**

Introductory Concepts in Transportation Decision Making: Overall transportation project development,budgeting, financial planning, the process of transportation project development, models associated withtransportationimpactevaluation.

**Unit II**

Transportation costs - Classification of transportation costs, transportation agency costs, transportationusercosts, generalstructureand behavior ofcostfunctions androad pricing.

**Unit III**

Estimating Transportation Demand and Supply - supply equilibration, dynamics of transportation demandand supply, elasticity of travel demand and supply, classification of elasticity; Vehicle operating costs:Fuel costs - Maintenance and spares, Depreciation - Crew costs - Value of travel time savings - Accidentcosts.

**UnitIV**

Economics of traffic congestion - Pricing policy; Economic analysis of projects - Methods of evaluation - Costbenefit ratio, first year rate of return, net present value, and internal-rate of return methods; Indirectcostsandbenefitsoftransportprojects.

**Unit V**

Financing of road projects - methods – Private Public Partnership (PPP) - Toll collection - Economicviability of Design-Build-Operate-Transfer Schemes – Risk Analysis – Value for Money analysis - CaseStudies.

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**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-312C | TrafficEngineering | 3-0-0 | 3 |

**UnitI:Trafficengineeringadministrationandfunctions.**:Trafficengineering.,Functions.,Organisation of traffic engineering department., Human factors governing road user behaviour., Othervehiclecharacteristics., Characteristicsof slowmovingtrafficin India.

**Unit II: Analysis and Interpretations of traffic studies.** : Statistical methods for traffic engineering.,General trends in speed data., Time mean speed and space mean speed., Traffic forecasting., Limitationsoftrafficforecasting.,Typesoftraffic.,Forecastsandmathematical models.,Periodforforecasting.

**Unit III: Traffic surveys.** : Speed, Journey time and delay surveys., Methods of measuring spot speeds.,Presentation of travel time and journey speed data., Vehicle volume count., Types of counts., Methodsavailable for traffic counts., Origin-destination survey., Checking the accuracy of survey data., Parkingsurveys.
**Geometricdesign.**:Highwayclassification.,Horizontalalignment.,Vertical
alignment., Sight distance., Intersections., Grade separated intersections., Design for pedestrian facilities.,Design criteria for separate cycle tracks., Traffic and parking problems., Design standards for on streetparkingfacilities., Offstreetparkingfacilities.

**Unit IV: Traffic control.** : Importance of traffic sign., Need for international standardisation., Generalprinciples of traffic signing., Types of traffic signs., Road markings & types, Traffic signals & types,Advantages and disadvantages of traffic signals., Coordinated control of signals., Traffic control aids andstreetfurnitures.
**Traffic regulations and traffic safety.**: Traffic regulations and traffic safety., Basic principles of trafficregulation., Regulation of speed, vehicles and driver., Road accidents., Cause and prevention., Roadaccidents and traffic engineering., Accident situation in India., Statistical methods for analysis of accidentdata.,Roadsandits effecton accidents., Costofroadaccidents.

**Unit V: Street lighting.** : Need for street lighting, Some laws of illumination, Appearance of lightedpavement., Types of lamps., Illumination of traffic rotaries., Lighting at bends, dual carriageways &bridges.,Tunnellighting.,Maintenance offlightinginstallations.

**TextBooks:**
1.TRAFFICENGINEERING.byMATSONT.M.SMITH,W.SANDHURDF.W.,M.G.HILLS
**References:**
1. TRAFFICENGINEERINGHANDBOOKbyEVANS,H.K,INSTITUTEOFTOWNPLANNERS,INDIA, 1stEdition,
2. ANINTRODUCTIONTOHIGHWAYTRANSPORTATIONENGINEERING.byCAPOLLE

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**
**EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-358C | ConstructionProjectManagementLab | 0-0-2 | 1 |

**CourseObjectives:**

- Studentwillgetcompleteknowledgeaboutapplicationsof CPMandPERT.
- Studentwilllearnabout howtobringtheprojecttocompletionontime.
- Syllabusemphasizesonmanagingtheprojectcost andcontingencies.

**ListofPracticals:**

1. Practical1:Introduction(IntroductiontoPrimavera-Primaveramodules) Introduction(ToGeneratetheEnterpriseprojectstructureandOrganizationalBreakdownStructurefora n organisation havingdifferentprojects)
2. Practical2: Introduction(Tocreateanewproject withthehelpofprimavera)
3. Practical3:CalendarsandScheduling(ToAddActivitytotheprojectandRelationshipstoactivities) CalendersandScheduling(Howtocreateaprojectcalenderandeditingofrelationshipsin Ganttchart and DeletingRelationship) CalendersandScheduling(ToaddPredecessorsandSuccessorsfordifferentactivitiesandformationofac tivitynetworkfor aconstructionproject)
4. Practical4:Introduction(ToCreateworkbreakdownstructureforaproject)
5. Practical 5: Activity, Resource and Project Codes (To Generate of activities and activity codes foraconstruction project)
6. Practical6:Activity,ResourceandProjectCodes(Toaddandassignresourcesforaprojectandgeneration of resourcecurve)
7. Practical7:ResourceAnalysisandLevelling(Howtopreparesourcehistogramandspreadsheet,resour celevelling)
8. Practical8: Updating(HowtosetandrestoreaBaselineandActivityinProgress)Practical
9. Updating(HowtoDisplayprogresslineinGantt Chartand updatingResourcesandcosts)

**SCHEME & SYLLABUS FROM-2020 BATCHSCHOOLOFENGINEERING&TECHNO LOGY**
**Department of Civil EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-356C | BuildingDrawingLab | 0-0-2 | 1 |

**CourseObjectives:**
• Studentwillgetcompleteknowledgeaboutapplications ofbuilding drawing using advanced designsoftware'ssuchas AutoCad 3D, Revit, etc.

**ListofPractical's:**
1. StudyExercise– PrinciplesofPlanning,OrientationandCompleteJoineryDetails(PaneledAndGlazedDoorsandWindows)
2. AReadingRoomWith R.C.C FlatRoof
3. AResidentialBuildingwithSingleBedRoom
4. LibraryBuildingWithR.C.CFlat Roof
5. ResidentialBuildingwithLoadBearingWallsandFlatRoof
6. FullyTiled Gabled House
7. Residential BuildingwithLoadBearingWallsandPitchedRoof
8. RCCFramed BuildingwithRCCRoof
9. PrimaryHealthCentre
10. School Building
11. WorkshopBuilding

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**Department of Civil EngineeringYear/Semester:3rdYear/6**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-360C | StructuralDrawingLab | 0-0-2 | 1 |

**CourseObjectives:**
• Studentwill getcompleteknowledgeaboutapplicationsofstructural drawingusingStaadProsoftware.

**ListofPractical's:**
1. Introductiontogeometric,material.
2. Introductiontomodelingofboundarycondition andapplication ofloads.
3. AnalysisandDesignofsimpleandContinuousRCCbeams.
4. AnalysisofresultsandpreparationofworkingdrawingshowinggeneralarrangementforCADdesignf or RCCbeams.
5. AnalysisandDesignofsingleandmultiplebayframeofRCC.
6. Analysis of results and preparation of working drawing showing general arrangement for CADdesignfor single and multiple bayframe ofRCC.
7. AnalysisoframedRCCstructureforDL,LLandearthquakeload.
8. Analysisofresultsandpreparationofworkingdrawingshowinggeneralarrangement.
9. AnalysisandDesignofaframedSteelstructure.
10. Analysisofresultsandpreparationofworkingdrawingshowinggeneralarrangementoframedsteel structure.
11. AnalysisandDesign ofSteelTrusssubjectedto Concentratedload,UDL andmovingload.

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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-401C | Earthquake Resistant Design of Structures | 3-1-0 | 4 |

**Unit I**

Earthquake Basics: Interior of Earth, plate tectonics, faults, consequences of earthquake, Basic parameters of earthquake, magnitude &intensity, scales, Seismic zones of India, damages caused during past earthquakes (worldwide).

**Unit II**

Fundamentals of Earthquake Vibrations of buildings: Static load v/s Dynamic load (force control and displacement control), simplified single degree of freedom system, mathematical modelling of buildings, natural frequency, resonance v/s increased response, responses of buildings to different types of vibrations like free and forced, damped and un-damped vibration, response of building to earthquake ground motion, Response to multi degree (maximum three) of freedom systems up to mode shapes

**Unit III**

Design Philosophy: Philosophy of earthquake resistant design, earthquake proof v/s earthquake resistant design, four virtues of earthquake resistant structures (strength, stiffness, ductility and configuration), seismic structural configuration, Introduction to IS: 1893 (Part I), IS: 875 (Part V). Seismic load: Seismic Coefficient Method – base shear and its distribution along height. Introduction to Response spectrum, IS code provisions.

**Unit IV**

Lateral Loads on Buildings: Lateral Load Distribution (SDOF): Rigid diaphragm effect, centers of mass and stiffness, torsionally coupled and uncoupled system, Lateral Load Analysis: Analysis of frames using approximate methods like portal & cantilever methods

**Unit V**

Ductile Detailing: Concepts of Detailing of various structural components as per IS: 13920 provisions, Introduction to Earthquake Resistant Features of un-reinforced &reinforced masonry Structure, Confined Masonry, Soil liquefaction, Structural controls, Seismic strengthening.

Reference Books:

1. Manish Shrikhande&PankajAgrawal; Earthquake resistant design of structures, PHI Publication, New Delhi
2. S.K.Duggal; Earthquake resistance design of structures; Oxford University Press, New Delhi.
3. A.K.Chopra; Dynamics of structures, Pearson, New Delhi

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**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-403C | Channel Hydraulics | 3-0-0 | 4 |

**UnitI:**
Introduction to Open Channel Flow: Difference between Open Channel Flow and Pipe Flow, Types of Channel, Geometric parameters of a channel, Classification of Open Channel Flow, Continuity and Momentum equation.

**Unit II:**
Uniform flow: Resistance flow formula, Velocity distribution, Equivalent roughness coefficient, Velocity coefficients, Uniform flow in rigid boundary channel, Uniform flow in mobile boundary channel

**Unit III:**
Energy and Momentum Principle: Concept of Specific Energy, Critical Depth, Alternate depth, Specific Force, Sequent depth. Non-Uniform Flow: Governing equation of GVF, Classification of Gradually Varied Flow, Computation of GVF profile, Rapidly Varied Flow, hydraulic Jump, Flow over a Hump, Flow in Channel Transition

**Unit IV:**
Canal Design: Concept of best hydraulic section, Design of rigid boundary canal, design of channel in alluvial formation- Kennedy's theory, Lacy's theory, Method of Tractive force, Free-board in canal. Unsteady Flow: Wave and their classification, Celerity of wave, Surges, Characteristic equation.
Pipe Flow: Losses in pipes, Pipe in series and parallel, Pipe network analysis, Water hammer, Surge tank
Hydraulic Model Study: Important dimensionless flow parameters, Similitude: Geometric, Kinematic and Dynamic Similarity, Model scales

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-405C | TrafficEngineering | 3-0-0 | 3 |

**UnitI:Trafficengineeringadministrationandfunctions.**:Trafficengineering.,Functions.,Organisation of traffic engineering department., Human factors governing road user behaviour., Othervehiclecharacteristics., Characteristicsof slowmovingtrafficin India.

**Unit II: Analysis and Interpretations of traffic studies.** : Statistical methods for traffic engineering.,General trends in speed data., Time mean speed and space mean speed., Traffic forecasting., Limitationsoftrafficforecasting.,Typesoftraffic.,Forecastsandmathematical models.,Periodforforecasting.

**Unit III: Traffic surveys.** : Speed, Journey time and delay surveys., Methods of measuring spot speeds.,Presentation of travel time and journey speed data., Vehicle volume count., Types of counts., Methodsavailable for traffic counts., Origin-destination survey., Checking the accuracy of survey data., Parkingsurveys.
**Geometricdesign.**:Highwayclassification.,Horizontalalignment.,Vertical
alignment., Sight distance., Intersections., Grade separated intersections., Design for pedestrian facilities.,Design criteria for separate cycle tracks., Traffic and parking problems., Design standards for on streetparkingfacilities., Offstreetparkingfacilities.

**Unit IV: Traffic control.** : Importance of traffic sign., Need for international standardisation., Generalprinciples of traffic signing., Types of traffic signs., Road markings & types, Traffic signals & types,Advantages and disadvantages of traffic signals., Coordinated control of signals., Traffic control aids andstreetfurnitures.
**Traffic regulations and traffic safety.**: Traffic regulations and traffic safety., Basic principles of trafficregulation., Regulation of speed, vehicles and driver., Road accidents., Cause and prevention., Roadaccidents and traffic engineering., Accident situation in India., Statistical methods for analysis of accidentdata.,Roadsandits effecton accidents., Costofroadaccidents.

**Unit V: Street lighting.** : Need for street lighting, Some laws of illumination, Appearance of lightedpavement., Types of lamps., Illumination of traffic rotaries., Lighting at bends, dual carriageways &bridges.,Tunnellighting.,Maintenance offlightinginstallations.

**TextBooks:**
1.TRAFFICENGINEERING.byMATSONT.M.SMITH,W.SANDHURDF.W.,M.G.HILLS
**References:**
3. TRAFFICENGINEERINGHANDBOOKbyEVANS,H.K,INSTITUTEOFTOWNPLANNERS,INDIA, 1stEdition,

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-407C | Waste Management | 3-0-0 | 3 |

**Unit 1**
**Relevant Regulations** Municipal solid waste (management and handling) rules; hazardous waste (management and handling) rules; biomedical waste handling rules; flyashrules;recycled plastics usage rules; batteries (management and handling) rules

**Unit 2**
**Municipal Solid Waste Management** – Fundamentals Sources; composition; generation rates; collection of waste; separation, transfer and transport of waste; treatment and disposal options

**Unit 3**
**Hazardous Waste Management** – Fundamentals Characterization of waste; compatibility and flammability of chemicals; fate and transport of chemicals; health effects

**Unit 4**
**Radioactive Waste Management** – Fundamentals Sources, measures and health effects; nuclear power plants and fuel production; waste generation from nuclear power plants; disposal options

**Unit 5**
**Environmental Risk Assessment** Defining risk and environmental risk; methods of risk assessment; case studies**Physicochemical Treatment of Solid and Hazardous Waste** Chemical treatment processes for MSW (combustion, stabilization and solidification of hazardous wastes); physicochemical processes for hazardous wastes (soil vapour extraction, air stripping, chemical oxidation); ground water contamination and remediation

**References:**
1. John Pichtel Waste Management Practices CRC Press, Taylor and Francis Group 2005.
2. LaGrega, M.D.Buckingham,P.L. and Evans, J.C. Hazardous Waste Management, McGraw Hill International Editions, New York, 1994.
3. Richard J. Watts, Hazardous Wastes - Sources, Pathways, Receptors John Wiley and Sons, New York, 1997.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-409C | Foundation Engineering | 3-1-0 | 4 |

**Unit 1**
Soil Exploration and Geophysical Investigation Introduction 1.10 Planning for subsurface exploration 1.11 Methods of exploration 1.12 Geophysical exploration 1.13 Soil sampling and samplers 1.14 In-situ tests 1.15 Common soil tests 1.16 Soil investigation report

**Unit 2**
Theory of Lateral Earth Pressure Introduction 2.11 Types of earth pressures 2.12 Different theories of earth pressures 2.13 Displacement-related earth pressure 2.14 Rankine and Coulomb theory 2.15 Friction circle method 2.16 Terzaghi's analysis 2.17 Development of bearing capacity theory 2.18 Development of uplift capacity theory

**Unit 3**
Methods of Analyses Introduction 3.8 Different methods of analysis 3.9 Limit equilibrium 3.10 Limit analysis 3.11 Method of characteristics 3.12 Finite element method

**Unit 4**
Design of Shallow Foundations Introduction 4.9 Different types of foundations 4.10 Calculation of bearing capacity 4.11 Stresses in soil 4.12 Concept of contact pressure 4.13 Calculation of settlements 4.14 Codal provision

**Unit 5**
Design of Deep Foundations Introduction 5.11 Different types of foundations 5.12 Design methodology for piles 5.13 Calculation of pile capacity 5.14 Stresses in pile 5.15 Analysis of pile group 5.16 Settlement of pile group 5.17 Concept of negative skin friction 5.18 Piles subjected to lateral loads 5.19 Pile load test 5.20 Design and construction of well foundation, piers etcDesign of Retaining Structures Introduction 6.10 Different types of retaining structures 6.11 Stability analysis of rigid walls 6.12 Design of cantilever sheet piles 6.13 Design of anchored sheet piles 6.14 Bracing system for underground construction 6.15 Failure analysis for bracing system

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-451C | Traffic and Transportation Engineering Lab | 0-0-2 | 1 |

1. Determination of specific gravity and water absorption of coarse aggregate.
2. Determination of particle size distribution.
3. Determination of aggregate impact value.
4. Determination of aggregate crushing value.
5. Determination of Los Angeles abrasion value of aggregates.
6. Determination of flakiness index and elongation index of coarse aggregate.
7. Determination of penetration value of bitumen.
8. Determination of softening point value of bitumen.
9. Determination of ductility value of bitumen.

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-453C | Seminar | 0-0-4 | 2 |

Presentation by each student on any other topics specified by the course coordinator.

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| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| PDP-401 | CampustoCorporate | 0-0-2 | 1 |

UNIT 1 –Employability Quotient - Resume Writing, Types of Resume, Profile Building
Resume Writing Practice

UNIT 2 – Group Discussion – Definition of GD, Difference between GD and debate, Do's and don'ts of GD. Mock GD sessions

UNIT 3 – Interview Skills – Facing Personal, Technical & HR, FAQ and their answers
Mock interviews

UNIT 4 – Organizational Skills at Work place – focus & productivity, delegation, resource management & management skills

UNIT 5 – Corporate Policies, Corporate Life, Corporate Etiquette Corporate Truths for every Fresher

UNIT 6 – Presentation Skills – how to prepare an effective Presentation Skills, do and don'ts of presentation. Mock presentations

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**Department of Civil**
**EngineeringYear/Semester:**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-423C | Hydropower Engineering | 3-0-0 | 3 |

**Unit I: Introduction**: Common building material, Mechanical properties of material, Comparison ofvarious mechanical properties. **Stones**: Common building stones, Requirement of a good building stones,Dressing and preservation of stones. **Bricks**: Manufacture of clay bricks, Classification and testing of claybricks,Problems ofefflorescence.

**UnitII:Lime**:Manufacture,Classificationoflime.**Timber**:Classificationandwoodbasedproductsoftimber,Defectsandtheirprevention,Factorseffectingthestrengthoftimber.,Seasoningandpreservationof timber.
**Asphalt, Bitumen and Tar**: Terminology, Bituminous materials, Specification and usage**Cement**: Properties, Usesand types;manufacturingandmaterials,PlasteringandFormWork.

**Unit III: Introduction of Buildings and Foundations**: General Introduction of Buildings, Types ofBuildings, Components of Buildings, Design Loads, Introduction of Foundation, Types of Foundation,Function of Foundation, Essential Requirements of a good Foundation, Site Investigation and Sub-SoilExploration, Method of Site Exploration, Settlement of Foundation, Causes of Failures**of** Foundationsand RemedialMeasures

**Unit IV: Bricks Masonry and Composite Masonry**: Introduction of Brick Masonry, Types of bricks,Bonds in brick work, Supervision of brick work, Defects in brick masonry, Strengths of brick masonry,Introduction of Composite Masonry, Reinforced brick masonry, Stone composite masonry, Brick-stonecomposite masonry, Concrete block masonry, Hollow clay block masonry,Damp Proofing, Termiteproofingand FireProtection of Buildings.

**UnitV:Walls**:Typesofwalls,Introductionofcavitywalls,Generalfeaturesofcavitywalls,Construction of cavity walls, Introduction of partition walls, Brick partitions, Clay block partition walls,Concretepartitions, Glasspartitions.
**Floors and Roofs**: Introduction of a Floor, Components of a Floor, Materials for Construction, Selectionof Flooring Material, Cement Concrete Flooring, Brick Flooring, Marble flooring, Asphalt Flooring,Introductionof Roofs,Types of Roofs,TrussedRoofs,SteelRoofTrusses

**Books:**

Building Construction, B. C.

PunmiaConstructionMaterials,S.C.Ran

gwala

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**LOGY**
**Department of Civil**
**EngineeringYear/Semester:**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-425C | TransportationEngineering&Systems | 3-0-0 | 3 |

**UNIT1:**
Transportation Systems and their classification and description.Role of Roads, Road Transport andPlanningin India.Road Userand the Vehicle.
**Highway Planning**: Highway Planning Process, specifically in India, Transport or Highway relatedAgenciesin India, Classification ofRoadsand Road DevelopmentPlans

**UNIT2:**
**HighwayGeometricDesign**:CrossSectionalElements,camber,SightDistances–definitionandanalysisofSSDand OSD.
**HighwayProjectPreparation:**SurveysandInvestigations.ControllingFactorsandSurveysforHighwayAlignment. RoadPatterns

**UNIT3:**
**Pavements:**TypesofPavements,RoadConstructionMaterials.HighwayMaintenance.
**Traffic Engineering:** Traffic Characteristics, Functions, PIEV theory, Traffic Survey, PCU, Parkings&survey,Trafficsigns, RoadMarkings,Traffic Signals,Traffic Safety.

**UNIT4:**
**IntroductiontoRailwayEngineering**
**Permanent Way Components**: Types and Selection of Gauges, Permanent way & its requirements,functions of rail, requirements of an ideal rail, types of rails, markings & length of rails, Drainage, SalientFeatures and types of Components viz. Rails, Sleepers, Ballast, Rail Fastenings, Coning of Wheels, WearRailJoints,Length of Rail,SleeperDensityand Spacing,Stations, Yards.
**Tunneling:**Introduction,advantages,disadvantages.

**UNIT5:**
**Airport Engineering: -Introduction**: Requirements to Airport Planning, Airport Classifications, FactorsinAirportSite Selection,AirportSize, Obstructions,Zoning.
**Planning and Design of Airport**: Requirements of Airport, Planning of Terminal Area, and differentLayouts, Location of Gates, Types of Runway patterns, Runway Layout, Runway Length, Layout ofTaxiways,ExitorTurnaround Taxiways, Apronand Hangers, Wind-rosediagram.

**ListofRecommendedBooks:**

4. TransportationEnggbyS.KSharma
5. HighwayEnggbyL.RKhadiyali
6. HighwayEnggbyJustoand Khanna
7. RailwayEngineeringbyS.C. Saxena
8. Airport Planning&DesignbyS.K.Khanna,NemChand&Bros.Publication

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| CourseCode | CourseName | L-T-P | Credit |
|---|---|---|---|
| CE-402C | Metro Systems & Engineering | 3-0-0 | 3 |

**Unit I**

GENERAL: Overview of Metro Systems; Need for Metros; Routing studies; Basic Planning and Financials

**Unit II**

CIVIL ENGINEERING-Overview and construction methods for: Elevated and underground Stations; Viaduct spans and bridges; Underground tunnels; Depots; Commercial and Service buildings. Initial Surveys & Investigations.

**Unit III**

CIVIL ENGINEERING- Basics of Construction Planning & Management, Construction Quality & Safety Systems. Traffic integration, multimodal transfers and pedestrian facilities; Environmental and social safeguards; Track systems-permanent way. Facilities Management

**Unit IV**

ELECTRONICS AND COMMUNICATION ENGINEERING- Signaling systems; Automatic fare collection; Operation Control Centre (OCC and BCC); SCADA and other control systems; Platform Screen Doors.

**Unit V**

MECHANICAL & TV + AC: Rolling stock, vehicle dynamics and structure; Tunnel Ventilation systems; Air conditioning for stations and buildings; Fire control systems; Lifts and Escalators ELECTRICAL: OHE, Traction Power; Substations- TSS and ASS; Power SCADA; Standby and Back-up systems; Green buildings, Carbon credits and clear air mechanics.

**SCHEME & SYLLABUS FROM-2020**
**BATCHSCHOOLOFENGINEERING&TECHNO**
**LOGY**
**Department of Civil**

| Course Code | Course Name | L-T-P | Credit |
|---|---|---|---|
| CE-452C | Internship | 0-0-32 | 16 |

Presentationbyeachstudentonhis/herpracticaltrainingandothertopicsspecifiedbythecoursecoordinator

| Course Code | Course Name | L-T-P | Credit |
|---|---|---|---|
| CE-454C | Seminar on Internship | 0-0-32 | 16 |

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Presentation by each student on any other topics specified by the course coordinator.

# ProjectAllotmentForm(B.Tech Civil)

Annexure-I

**SubjectCode&Name:**

**ProjectTitle**

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**Abstract**

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| S.No. | RollNumber(B.Tech) | Nameof Student |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| GroupLeaderName& ContactNo.: | | |
| Nameof the Guide…… | | Signatureofthe Guide …… |

**RemarksofProjectCoordinator**

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**Signatureof ProjectCoordinator**……**Signatureof HOD** ……

**DepartmentofCivilEngineering**

**Lingaya'sVidyapeeth**
**(ApprovedbyMHRD/AICTE/PCI/BCI/COA/NCTE,Govt.ofIndia,u/s 3of UGCAct 1956)**

**Nachauli, Jasana Road, Faridabad – 121002www.lingayasuniversity.edu.in**