VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI.

Scheme of Teaching and Examinations and Syllabus

MASTER OF ARCHITECTURE (CONSTRUCTION PROJECT MANAGEMENT)(ACM)

(Effective from Academic year 2020-21)

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examinations – 2020 - 21
M.ARCH CONSTRUCTION PROJECT MANAGEMENT(ACM)
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

I SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week				Examination					Credits
				Lecture	Studio	Skill Development Activities	Total hours	Duration in hours	CIE Marks	SEE Marks		Total Marks	
										Theory	Viva-voce		
				L	S	SDA							
1	PCC	20ACM11	Project Management-1	04	02	02	08	03	40	60	--	100	6
2	PCC	20ACM12	Contract Management	03	02	02	07	03	40	60	--	100	5
3	PCC	20ACM13	Site Organization & Construction Environmental Management	03	--	04	07	03	40	60	--	100	5
4	PSC	20ACM14	Project Appraisal & Project Finance	02	--	04	06	--	40	--	60	100	4
5	PSC	20ACM15	Research Methods	02	--	--	02	--	100	--	--	100	2
6	PEC	**20ACM16X**	Professional Elective1	01	02	--	03	--	100	--	--	100	2
7	PSC	20ACM17	PM Softwares1	01	02	--	03	--	100	--	--	100	2
			TOTAL	**16**	**08**	**12**	**36**	**09**	**460**	**180**	**60**	**700**	**26**

Note:PCC: Professional Core, PSC: Professional Support, PEC: Professional Elective.

Professional Elective1

Course Code under 20CPM16X	Course title
20ACM161	Special Construction Methods & Techniques
20ACM162	Construction Demolition and Waste Management
20ACM163	Disaster Management
20ACM164	Sustainable Constructions

1. Studio:
Students and course instructor/s to involve either individually or in groups to interact together to enhance the learning and application skills.
The students should interact with construction industry (small, medium and large), understand their problems or foresee what can be undertaken for study in the form of research/ case studies / testing / projects, and for creative and innovative methods to solve the identified problem. The students hall:
(1) Gainconfidenceinworkingalongwithconstructionindustryprofessionals.
(2) Workondifferentsoftware/s(tools)toSimulate,analyseandauthenticatetheoutputtointerpretandconclude.
(3) Handleadvancedconstruction equipmentandmaterialstoenhancetechnicaltalent.
(4) Involveincasestudiesandfieldvisits/fieldwork.
(5) Accustomwiththeuseofstandards/codesetc.,tonarrowthegapbetweenacademiaandconstructionindustry.
Allactivitiesshouldenhancestudent'sabilitiestoemploymentand/orself-employmentopportunities,managementskills,Statisticalanalysis,fiscalexpertise,etc.

2. SkillDevelopmentActivities:
Theymaybeintheformofperiodicsitevisits,guestlectures,conferencesandwebinars,not afixed slotintimetables.

3. Vivavoce:
Theviva voce shallbeconductedforadurationof20minutes(per student)for thesubjectslistedundervivavoceforallthe semesters.

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II SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week				Examination					Credits
				Lecture	Studio	Skill Development Activities	Total hours	Duration in hours	CIE Marks	SEE Marks		Total Marks	
										Theory	Theory		
				L	S	SDA							
1	PCC	20ACM21	Project Management-2	04	02	02	08	03	40	60	--	100	6
2	PCC	20ACM22	Project Scope, Schedule & Cost Management	03	02	02	07	03	40	60	--	100	5
3	PCC	20ACM23	Project Resource Management–Material, Equipment & Human Resource Management	03	--	04	07	03	40	60	--	100	5
4	PSC	20ACM24	Management Information System & Communication Management	02	04	--	06	--	40	--	60	100	4
5	PSC	20ACM25	Legal Frame work of Construction	02	--	--	02	--	100	--	--	100	2
6	PEC	**20ACM26X**	Professional Elective2	01	02	--	03	--	100	--	--	100	2
7	PSC	20ACM27	PM Softwares2	01	02	--	03	--	100	--	--	100	2
			TOTAL	**16**	**12**	**08**	**36**	**09**	**460**	**180**	**60**	**700**	**26**

Note:PCC: Professional Core, PSC: Professional Support, PEC: Professional Elective.

Professional Elective2

Course Code under 20CPM25X	Course title
20ACM261	Project Recovery
20ACM262	International Project Management
20ACM263	Project Schedule Management
20ACM264	Entre preneurship

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Scheme of Teaching and Examinations – 2020 - 21
M.ARCH CONSTRUCTION PROJECT MANAGEMENT(ACM)
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

IIISEMESTER

Sl. No	Course	Course Code	CourseTitle	TeachingHours /Week				Examination					Credits
				Lecture	Studio	SkillDevelopmentActivities	Totalhours	Durationinhours	CIEMarks	SEEMarks		TotalMarks	
										Theory	Vivavoce		
				L	S	SD							
1	PCC	20ACM31	Conflict Management & Dispute Resolution	03	02	02	07	03	40	60	--	100	5
2	PCC	20ACM32	Project Risk Management	03	02	02	07	03	40	60	--	100	5
3	PCC	20ACM33	Advanced ConstructionTechniques	03	--	04	07	03	40	60	--	100	5
4	Project	20ACM34	DissertationStage–1	03	02	02	07	--	40	--	60	100	5
5	PSC	20ACM35	Construction Quality & Safety Management	02	--	--	02	--	100	--	--	100	2
6	PEC	**20ACM36X**	Professional Elective3	01	02	--	03	--	100	--	--	100	2
7	Internship	20ACM37	Professional Training / Internship	(Completed duringthe interveningvacation between IIandIIIsemesters.)				--	--	--	100	100	4
			TOTAL	**15**	**08**	**10**	**33**	**09**	**360**	**180**	**160**	**700**	**28**

Note:PCC:ProfessionalCore,PSC:ProfessionalSupport,PEC:ProfessionalElective.

ProfessionalElective3

Course Codeunder20CPM35X	Coursetitle
20ACM361	Facility Management
20ACM362	Real Estate Management
20ACM363	Infrastructure Management–Airports, Tunnelling Marine / Offshore Construction
20ACM364	Value Engineering in Construction Management

Note:

1. Dissertation Stage-1: Students in consultation with the guide/co-guide if any, shall pursue literature survey and completethe preliminary requirements of selected Project work. Each student shall prepare relevant introductory project document and present a seminar.

CIE marks shall be awarded by a committee comprising of Dean, PG course/HoD and Guide/co-guide of the department.The CIE marks awarded for Dissertation Stage -1, shall be based on the evaluation of Dissertation Report, DissertationPresentationskillandperformanceinQuestion-and-Answersessionintheratio50:25:25.

SEE(Universityexamination) shall beaspertheUniversitynorms.

2. Internship Requirements: All the students have to undergo mandatory internship of 8 weeks during the vacationbetweenIIandIIIsemesters.AUniversityexaminationshallbeconductedduringIIIsemesterandtheprescribedinternshipcreditshallbe countedforthesame semester.Internshipshallbeconsideredasa headofpassingandshallbeconsideredfortheawardofdegree.Thestudentsarerequiredtosubmitperiodicprogressreportsoftheinternshipundertaken.

3. Internship Assessment:CIE marks shall be awarded by a committee comprising of Dean and PG course/HoD. The CIEmarks awarded for Internship, shall be based on the evaluation of Internship Report, Internship Presentation skill andperformance in Question-and-Answer session in the ratio 50:25:25. Those, who have not pursued /completed the internshipshallbedeclaredasfailininternshipcourseandhavetocompletethesameduringsubsequentUniversityexaminationsafter

VISVESVARAYATECHNOLOGICALUNIVERSITY,BELAGAVI
Scheme of Teaching and Examinations – 2020 –
21M.ARCHCONSTRUCTIONPROJECTMANAGEMENT(ACM)
Choice Based Credit System (CBCS) and OutcomeBasedEducation(OBE)

IVSEMESTER

Sl. No	Course	Course Code	CourseTitle	TeachingHours /Week				Examination				Credits
				Lecture	Studio	Skill Development Activities	Totalhours	Durationinhours	CIEMarks	SEEMarksVivavoce	TotalMarks	
				L	S	SDA						
1	Project	20ACM41	Dissertation Stage-2	12	06	10	28	--	40	60	100	20
			TOTAL	**12**	**06**	**10**	**28**	--	**40**	**60**	**100**	**20**

Note:

1. **DissertationStage-2:**CIEmarksshallbeawardedbyacommitteecomprisingofPrincipal/Dean,PGCoordinator/HOD and Guide/Co-guideof the department. The CIE marks awarded for Dissertation Stage 2, shall be basedon the evaluation of Dissertation Report, Dissertation Presentation skill and performance in Question-and-Answer sessionintheratio 50:25:25.

SEE shall be at the end of IV semester. Dissertation work evaluation and Viva-Voce examination (SEE), after satisfyingtheplagiarismcheck,shallbeaspertheUniversitynorms.

PROJECT MANAGEMENT–1			
CourseCode	20ACM11	CIEMarks	40
TeachingHours/Week(L:S:SDA)	4:2:2	SEEMarks	60
Credits	06	ExamHours	03

Module-1

IntroductiontoProject,itsStagesandConstructionProjectmanagement:Project,Organization,needformanagementofbuilding/constructionprojects,PrinciplesandObjectivesofProjectManagement,briefunderstandingaboutstudyareasinProjectManagement.TypesofConstructionProjects.Project,programand portfoliomanagement.

Module-2

BASICS OF PROJECT MANAGEMENT: Project Life Cycle, Types of projects, Phase of project, projectmanagement and its relevance, stakeholders of a project, structure of project organization, management levels,Failuresandsuccessofaproject

Module-3

Roles of Project Manager: Roles & Responsibilities of Project/ Construction Managers, Scope Management inConstruction:ScopePlanning,Definition,VerificationandControlProjectManagementStages:Projectplanning,projectschedulingandprojectcontrolling

Module-4

PROJECT PLANNING& SCHEDULING: Introduction, Time Cost and Resource management, projectplanning,WorkBreakdownStructure(W.B.S.),Planningterminologies,NetworkTheories-CPM,PERT,Projectcrashing

Module-5

PROJECTMONITORINGANDCONTROL:Introduction,Scopeverification&control,Schedulecontrol,Cost control,Qualitycontrol,Performancereporting,Riskcontrolandcontractadministration

Note: Theabovetopicsshallbesupplementedwithsitevisitstomarqueeprojectswithinandoutsidethe country.

Courseoutcomes:

Attheendofthecoursethestudentwillbeableto:disseminatetheapplicationofProjectManagementinvariousphasesof projectembracingProjectManagementprocesses.

Questionpaperpattern:

TheSEEquestionpaperwillbesetfor100marksandthemarksscoredwillbe proportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequalmarks.
- Eachfullquestionisfor20marks.
- Therewillbetwofullquestions(withamaximumoffoursubquestions)fromeachmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopicsunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingonefullquestionfromeachmodule.

References

- AssociationforProjectManagement,2012.*APMbodyofknowledge*.Buckinghamshire:AssociationforProjectManagement.
- Guide,A.,2017.*ProjectManagementBodyofKnowledge(PMBOK®GUIDE)*.ProjectManagementInstitute.
- Dr.K.G.KrishnamurthyandS.V.Ravindra,2008.*ConstructionandProjectManagement*.
- Hendrickson,C.,Hendrickson,C.T.andAu,T.,1989.*Projectmanagementforconstruction:Fundamentalconceptsforowners,engineers,architects,andbuilders*.ChrisHendrickson.
- Chris,H.,2003.ProjectManagementforConstruction:FundamentalConceptsforOwners,Engineers,ArchitectsandBuilders. Departmentof CivilandEnvironmentalEngineering.
- Punmia,B.C.andKhandelwal,K.K.,2002.*ProjectPlanningandControlwithPERT&CPM*.Firewallmedia.
- Jha,K.N.,2015.*ConstructionProjectManagement:TheoryandPractice*.PearsonEducationIndia.
- Chitkara,K.K.,1998.*Constructionprojectmanagement*.TataMcGraw-HillEducation.

CONTRACT MANAGEMENT			
CourseCode	20ACM12	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:2:2	SEEMarks	60
Credits	05	ExamHours	03

Module-1

CONSTRUCTION CONTRACTS: Indian Contract Act (1872): Definition of the contract as per the ACT.Valid,Voidable,Voidcontracts,Objectivesoftheact. Clauses1to75-Contractformation,contractperformance,validexcusesfornon-performance,Breachofcontract,effectsofbreach-understandingthe clausesandapplyingthemtosituations/scenariosonconstructionprojects.

Module-2

CONTRACTFORMATION:Standardformsofcontracts,methodsofinvitingtenders,pre-bidmeetings,pre-qualificationsystem,scrutinyoftendersandcomparativestatement.

Module-3

CONTRACTFORMATION:conditionsofcontracts,contractswithvariousstakeholdersonamajorconstructionproject,contractpricingbytheclient,projectmanagementconsultantsandthecontractor,contractperformance, contractcorrespondenceandcontract closure

Module-4

CONTRACTCONDITIONS:a)GeneralconditionandParticularconditions,b)ConditionsofMinistryofStatisticsandProgram Implementation- GovernmentofIndia.Modelformsofcontract.

Module-5

FIDIC: ICE conditions-Introduction, FIDIC conditions- evolution of FIDIC document, types based on whetherdesign is of employer or contractor, Design & Build contract, EPC contract, short forms of contract- ColourCode.VariousconditionsofRedBook.

Note: Theabovetopicsshallbesupplementedwithsitevisitstomarqueeprojectswithinandoutsidethe country.

Courseoutcomes:

Attheendofthecourse thestudentwillbe ableto:understandthenecessities ofa contractanditsmanagementapplications.

Questionpaperpattern:

TheSEEquestionpaperwillbesetfor100marksandthemarksscoredwillbe proportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequalmarks.
- Eachfullquestionisfor20marks.
- Therewillbetwofullquestions(withamaximumoffoursubquestions)fromeachmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopicsunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingonefullquestionfromeachmodule.

References

- Clough,R.H.,Sears,G.A.,Sears,S.K.,Segner,R.O.andRounds,J.L.,2015.*ConstructionContracting:APractic alGuidetoCompanyManagement*.JohnWiley&Sons.
- BuildingandEngineeringcontractsLawandPracticebyP.C.Makranda
- DigestofIndianContractAct1872(2011onwards)
- LawofcontractPartIandPartII,Dr.R.K. Bangia-2005Edition,AllahabadLawAgency
- StandardGeneralConditionsforDomesticContracts-2001Edition-PublishedbyMinistryOfStatisticsandProgramImplementation, GovernmentofIndia.
- FIDICDocument(1999).

SITE ORGANISATION & CONSTRUCTION ENVIRONMENTAL MANAGEMENT			
CourseCode	20ACM13	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:0:4	SEEMarks	60
Credits	05	ExamHours	03

Module-1

Demolition.Thesite(LayoutandOrganization).Siteinputsplanning.Siteworksplanning,Temporaryconstruction lighting.Electricityonbuildingsite.Winter and MonsoonConstruction.

Module-2

Sitecostcontroltechniques.Sitequalitycontroloperations,Qualitycontrolofconcretingandsteel.Improvingsite productivity.Siteaccounts.

Module-3

Anintegrativemethodology&Effectivepreventionatpre-constructionstage:LocalregulationofCEM.Qualitativeanalysisofconstructionpollution.Constructionpollution measurements.Projectschedulingtogetherwith EM using CPI. A pseudo-resource approach for CPI levelling. CPI levelling using GA. Introduction toDEMAPandDEMAN. CEMreports. Sitewastematerial managementplan

Module-4

Effective control at construction stage: General construction waste. CEM construction technologies. CEMmaterials. Management methods. Incentive reward programs. Barcoding technologies in CEM. Addressing airquality in the CEMP. Addressing noise in the CEM. Site contamination. Addressing water quality in the CEM.Implementation of environmental reportduringconstruction.

Module-5

Effectivereductionatpost-construction:Contaminatedlandremediation.Salvaging,Recycling.Disposingofnon-hazardousdemolitionandconstructionwaste.Wastageauditatsite.Onlinewasteexchangeapproachplan.

Note: Theabovetopicsshallbesupplementedwithsitevisitstomarqueeprojectswithinandoutsidethe country.

Courseoutcomes:

At the end of the course the student will be able to: understand the management of site at various conditions andtobe aware of theenvironmentalimpacts ofConstructionand methodsofmitigation

Questionpaperpattern:

TheSEEquestionpaperwillbesetfor100marksandthemarksscoredwillbe proportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequalmarks.
- Eachfullquestionisfor20marks.
- Therewillbetwofullquestions(withamaximumoffoursubquestions)fromeachmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopicsunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingonefullquestionfromeachmodule.

References

- Jain,R.K.andRao,S.S.,2008.*Industrialsafety,healthandenvironmentmanagementsystems*.Romes hChander Khanna.
- Ferrett,E.andHughes,P.,2015.*Introductiontohealthandsafetyinconstruction:FortheNEBOSHnational certificateinconstructionhealthandsafety*.Routledge.
- BasudevPanda,2013*IndustrialSafety,HealthEnvironmentandSecurity*.LaxmiPublications;FirstEd.
- Li,H.andChen,Z.,2007.EnvironmentalManagementinConstruction:AQuantitativeApproach.
- Griffith,A.,1994.*Environmentalmanagementinconstruction*.MacmillanInternationalHigherEducation.
- Uren,S.andGriffiths,E.,2000.*Environmentalmanagementinconstruction*.
- Rapp,R.R.andBenhart,B.L.eds.,2015.*ConstructionSitePlanningandLogisticalOperations:Site-FocusedManagementforBuilders*.PurdueUniversityPress.
- Dr.K.G.KrishnamurthyandS.V.Ravindra,2008.*ConstructionandProjectManagement*.
- Barrie,D.S.andPaulson,B.C.,1984.*Professionalconstructionmanagement*.NewYork:McGraw-Hill.
- Ritz,G.J.,1994.*Totalconstructionprojectmanagement*.
- Toole,T.M.,2002.Constructionsitesafetyroles. *JournalofConstructionEngineeringandManagement*,*128*(3),pp.203-210.
- RoyChudley,RogerGreeno,mikeHurst,SimonTopliss,*AdvancedconstructionTechnology*.

PROJECT APPRAISAL & PROJECT FINANCE			
CourseCode	20ACM14	CIEMarks	40
TeachingHours/Week(L:S:SDA)	2:0:4	SEEMarks	60
Credits	04	ExamHours	--

Module-1

Introductiontoprojectappraisal.SWOTanalysis.Process:Initialassessments,defineproblemsandlong-list,Consultandshort-list,evaluate alternates, Compare and select appraisal. Types of appraisal – Technical, Project, Legal, Environmental, Commercial & marketing,organizational or management (cost benefit analysis), Economical –(Costeffectiveanalysis,scoring &weighing

Module-2

Project

budgeting.Projectc

ostanalysis.Project

cashflow.

JointventuresandBOOTprojects

IntroductiontosoftwareslikeARGUSEnterprise

Module-3

Definition of project finance. Reasons for project finance. Types andsponsorsofprojectfinance.Overviewofthefeaturesof projectfinance. The Role of Advisors in a Project Finance Deal – The Role ofLegal Advisors in Project Finance Deals, The role of the independentengineerinprojectfinancedeals.

Module-4

Themarketforprojectfinance–applicationsandsectors.

ProjectCharacteristics,RiskAnalysis,andRiskManagement.Identifying project risks, Risk allocation with contracts stipulated bytheSPV.

Module-5

Valuing the project and project cash flow analysis. Financing the deal.CreditRiskinProjectFinanceTransactionsandthe.NewBaselCapitalAccord. ProjectAccounting.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
At the end of the course the student will be able to: familiarize thefundamentals of financial management concepts and their applicationsinthevariousphases
oftheprojectcycleofconstructionprojects.

References

- *ProjectandInfrastructureFinance*VikasSrivastava(Author),V.Rajaraman(Author)
- Dinku,A.,2003. *ConstructionManagementandFinance*.
- Coombs,W.E.,2019.*ConstructionAccountingandFinancialManagement*.
- 2017. *Financial Management Essentials You Always Wanted ToKnow:(Self-LearningManagementSeries):3*VibrantPublishers,2nd ed.2017
- Chandra,P.,2011.*Financialmanagement*.TataMcGraw-HillEducation.
- Gatti,S.,2012.*Projectfinanceintheoryandpractice:designing,structuring, and financing private and public projects*. AcademicPress.

RESEARCH METHODS			
CourseCode	20ACM15	CIEMarks	100
TeachingHours/Week(L:S:SDA)	2:0:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

ResearchMethodology: Introduction,MeaningofResearch,Objectives of Research, Motivation in Research, Types of Research,Research Approaches, Significance ofResearch, Research Methodsversus Methodology, Research and Scientific Method, Importance ofKnowing How Research is Done, Research Process, Criteria of GoodResearch,andProblemsEncounteredbyResearchersin India.

Defining the Research Problem: Research Problem, Selecting theProblem, Necessity of Defining the Problem, Technique Involved inDefiningaProblem,AnIllustration.

Module-2

Reviewing the literature: Place of the literature review in research,Bringingclarityandfocustoyourresearchproblem,Improvingresearch methodology, Broadening knowledge base in research area,Enabling contextual findings,How to review the literature, searchingthe existing literature, reviewing the selected literature, Developing atheoretical framework, Developing a conceptual framework, Writingabout theliteraturereviewed.

Research Design: Meaning of Research Design, Need for ResearchDesign, Features of a Good Design, Important Concepts Relating toResearchDesign,DifferentResearchDesigns,BasicPrinciplesofExperimentalDesigns,ImportantExperimentalDesigns.

Module-3

DesignofSampling: Introduction,SampleDesign,SamplingandNon-sampling Errors, Sample Survey versus Census Survey, Types ofSampling Designs.

MeasurementandScaling: QualitativeandQuantitativeData,ClassificationsofMeasurementScales,GoodnessofMeasurementScales,SourcesofErrorinMeasurementTools,Scaling,ScaleClassificationBases,ScalingTechnics,MultidimensionalScaling,DecidingtheScale.

Data Collection: Experimental and Surveys,Collection of PrimaryData, Collection of Secondary Data, Selection of Appropriate Methodfor DataCollection,CaseStudyMethod.

Module-4

TestingofHypotheses: Hypothesis,BasicConceptsConcerningTestingofHypotheses,TestingofHypothesis,TestStatisticsandCriticalRegion,CriticalValueandDecisionRule,ProcedureforHypothesisTesting, HypothesisTestingforMean,Proportion,Variance,forDifferenceofTwoMean,forDifferenceofTwoProportions,forDifferenceofTwoVariances,P-Valueapproach,PowerofTest,Limitationsofthe TestsofHypothesis.

Chi-square Test: Test of Difference of more than Two Proportions,Test of Independence of Attributes, Test of Goodness of Fit, CautionsinUsingChiSquare Tests.

Module-5

InterpretationandReportWriting: MeaningofInterpretation,Technique of Interpretation, Precaution in Interpretation, SignificanceofReportWriting,DifferentStepsinWritingReport,Layoutofthe ResearchReport,TypesofReports,OralPresentation,Mechanicsof

WritingaResearchReport,PrecautionsforWritingResearchReports. **IntellectualProperty:**TheConcept.
Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.
Courseoutcomes: Attheendof the coursethestudentwillbeableto:developtheresearch skills in a systematic manner which will impart the ability toselect appropriate research methodology, experimental design, followprofessionalethicsandacademicintegrity,anddevelop writtenpresentation skills.
References
ResearchMethodology:MethodsandTechniques,C.R.Kothari, GauravGarg,NewAgeInternational,4th Edition, 2018. ResearchMethodologyastep-by-stepguideforbeginners.(Forthetopic Reviewing the literature under module 2),RanjitKumar,SAGEPublications,3rd Edition, 2011. Study Material (For the topic Intellectual Property under module5), Professional Programme Intellectual Property Rights, Law andPractice, The Institute of Company Secretaries of India, StatutoryBodyUnderanAct ofParliament,September2013. ResearchMethods:theconciseknowledgebase,Trochim,Atomic DogPublishing,2005. ConductingResearchLiteratureReviews:FromtheInternett oPaper,FinkA,SagePublications,2009.

PROFESSIONAL ELECTIVE1			
CourseCode	20ACM16	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--
20ACM161	SpecialConstructionMethods&Techniques		
20ACM162	Entrepreneurship		
20ACM163	ProjectDisasterManagement		
20ACM164	Sustainable Constructions		
Note: The abovetopicsshall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.			
Courseoutcomes: At the endof thecourse thestudentwillbe ableto:identify andspecializeintheirareaofinterestunderConstructionProjectManagement.			

PROFESSIONALELECTIVE1:Special Construction Methods & Techniques			
CourseCode	20ACM161	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

ConceptualUnderstandingofvariouslargespanstructures;Principles,methods of fasttrackconstruction projects.

Module-2

Studyofadvancebuildingmaterials

Module-3

ConceptualUnderstandingofHigh-risebuildings
ConceptualUnderstandingofPre-fabricationinbuildingconstruction.

Module-4

Bridges, types construction of special type of bridges such as cablestayedbridge, suspensionandprestressedbridge,constructionoffoundationandsuperstructure.

Module-5

Construction,maintenanceofundergroundrailways
Offshorestructure,types,methodsofconstructionandmaintenance.

Note: The abovetopics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:Understandthevariousadvancedconstructionmethodsandtheirtechnologies.

References

- Ioannou, P.G. and Liu, L.Y., 1993. Advanced constructiontechnologysystem—ACTS.*JournalofConstructionEngineeringand Management*,*119*(2), pp.288-306.
- Dingli, Z.H.A.N.G., Mengshu, W.A.N.G., Jun, G.A.O. andZhaowei, L., 2003. Construction technique of large-span tunnelunder condition of complicated surrounding rocks. *ChineseJournalofRockMechanicsandEngineering*,*22*(2),pp.290-296.
- Potienko,N.D.,Kuznetsova,A.A.,Solyakova,D.N.andKlyueva,Y.E., 2018. The global experience of deployment of energy-efficient technologies in high-rise construction. In *E3S Web ofConferences*(Vol.33,p.01017).EDPSciences.
- Smith,R.E.,2010.*Prefabarchitecture:Aguidetomodulardesignand construction*.John Wiley&Sons.
- Doran,D.andCather,B.eds.,2013.*Constructionmaterialsreferencebook*. Routledge.
- Head,P.R.,2001,August.Constructionmaterialsandtechnology: a look at the future. In *Proceedings of the Institution of CivilEngineers-Civil Engineering* (Vol. 144, No. 3, pp. 113-118).Thomas TelfordLtd.

PROFESSIONALELECTIVE1:Construction Demolition and Waste Management			
CourseCode	20ACM162	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Conceptual Understanding of Demolition Techniques, Demolition byMachines,DemolitionbyExplosives,Advancedtechniques usingRoboticMachines,DemolitionSequence,DismantlingTechniques,
Safety precaution in Demolition and Dismantling. Case studies of suchDemolition Techniquesandreporting.

Module-2

Study and reporting of IS code provision for demolition and waste management as per IS 4130-1991 and central pollution control board-C&D waste management rules-2016

Module-3

EnvironmentalImpactofBuildingMaterialsEmbodiedenergyofmaterials;impact onthelocalenvironment;toxicityofthematerial;lifecycle assessment. Nature and Source Direct and indirect waste; sitetypesandorigins;composition;quantity;currentrecycling/reuse Potentialofbuildingmaterials.

Module-4

Construction and Demolition Waste Management Plans, Internationalgoodpractice;planningrequirements;companypolicy; demolitionplans;siteimplementation;supplieragreements;sub−contractormanagement; role of waste management contractor; training;
auditing;skipmanagement;currentmarkets;currentdisposaloptions;healthandsafety; reporting to local authorities. Treatment of Construction
andDemolitionWaste,wastepermits;wastelicenses;wastetransferfacilities;landfills;treatmenttechnologies;hazardouswastefacilities.
reportingtoEPA

Module-5

Designing for Waste Prevention and Minimization;client,contractoranddesignerattitudes;propermaintenance of existing buildings; reuse of existing building structure;designflexibility;designforreuseandrecycling;dimensionalco−ordinationandstandardization;modulardesign;materialselection
&Control.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
At the end of the course the student will be able to: Understand theapplicationconstructionanddemolitionwastetovariousbuildingstructured.

References

- Stessel,R.I.,2012.*Recyclingandresourcerecoveryengineering:principles of waste processing*. Springer Science & BusinessMedia.
- Winkler,G.,2010.*RecyclingConstruction&DemolitionWaste:ALEED-BasedToolkit(GreenSource)*.McGrawHillProfessional.
- Jeffrey,C.,2011.Constructionanddemolitionwasterecycling:Aliteraturereview.*DalhousieUniversity'sOfficeof Sustainability*,*35*.
- Tam,V.W.andTam,C.M.,2008.*Re-useofconstructionanddemolition wasteinhousingdevelopments*.

PROFESSIONALELECTIVE1:Disaster Management			
CourseCode	20ACM163	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Introduction:Disaster: Definition, Factors and Significance;DifferenceBetweenHazardandDisaster;NaturalandManmadeDisasters:Difference,Nature, TypesandMagnitude.

Module-2

Repercussions of Disasters and Hazards: Economic Damage, Loss ofHuman and Animal Life, Destruction of Ecosystem, Natural Disasters:Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts andFamines,LandslidesandAvalanches,Man-madedisaster:Nuclear ReactorMeltdown,IndustrialAccidents,OilSlicksandSpills,OutbreaksofDiseaseandEpidemics,War andConflicts.

Module-3

Disaster Prone Areas in India: Study of Seismic Zones; Areas Proneto Floods and Droughts, Landslides and Avalanches; Areas Prone toCyclonic and Coastal Hazards with SpecialReference to Tsunami;Post-Disaster Diseases andEpidemics.

Module-4

Disaster Preparedness and Management: Preparedness: Monitoringof Phenomena Triggering A Disaster or Hazard; Evaluation of Risk:Application of Remote Sensing, Data from Meteorological and OtherAgencies,MediaReports:GovernmentalandCommunity Preparedness.

Module-5

DisasterMitigation:
Meaning,ConceptandStrategiesofDisasterMitigation, Emerging Trends in Mitigation. Structural Mitigation andNon-Structural Mitigation,Programs ofDisasterMitigation.

Note: The abovetopics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthe coursethestudentwillbeable to:Understandtheroleof disaster management within depth knowledge of resilience and riskreduction.

References

- Nishith, R. and Singh, A.K., Disaster Management in India:Perspectives,issuesandstrategies.*NewRoyalbookCompany*.
- Sahni, P., DHAMEJA, A. and MEDURY, U., 2001. *Disastermitigation:experiencesandreflections*.PHILearningPvt.Ltd.
- Goel, S.L., 2009. Disaster Administration And Management TextAndCaseStudies",Deep&DeepPublicationPvt. *Ltd.,NewDelhi*.
- Carter,W.N.,2008.Disastermanagement:Adisastermanager'shandbook.

PROFESSIONALELECTIVE1:Sustainable Constructions			
CourseCode	20ACM164	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Sustainable Construction Materials – Marginal materials, recycled materials, design aspects, construction practices using non-conventional materials and methods, milling and recycling techniques

Module-2

Energy Savings in Construction – Fundamentals of energy – Energy production systems, Energy and resource conservation, Energy efficient design strategies, Renewable energy sources – advantages anddisadvantages; Energy management and conservation: electricalequipment – Improvement of power factor -maximum energy demand.

Module-3

Energy savings in electrical appliances used in buildings (pumps, fans, Compressed air systems, lighting systems, Air conditioning systems): Energy in building materials, energy efficient and environment friendly building: Thermal comfort and solar radiations.

Module-4

Green building rating system: Introduction to IGBC and LEED rating systems – various criteria for building rating.

Module-5

Pollutions and Management – air, water, noise pollutions and reduction measures during planning, design and construction.

Note: The abovetopics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:Understandthesustainableconstructionpracticesandtheirtechnologies.

References

- K S Jagadish, B V Venkataramana Reddy, K S Nanjunda Rao, *"Alternative Buildings Materials and Technologies"*, 2e, New Age International Publishers, New Delhi, ISBN: 978-9385923876, 2017
- K S Jagadish*, "Sustainable Building Technologies"*, IK International Publishers Pvt. Ltd, New Delhi, ISBN: 978-9386768209, 2019.
- Moore F: Environmental Control System McGraw Hill, Inc., 1994.
- JMPQ Delgado, *"Sustainable Materials in Building Construction"*, Volume 11, Building Pathology and Rehabilitation, Springer, ISBN 978-3-030-46799-9 ISBN 978-3-030-46800-2 (eBook), 2020
- Brown, G Z, *Sun, Wind and Light: Architectural design strategies*, John Wiley, 1985

PM SOFTWARE 1			
CourseCode	20ACM17	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Getting Started with Microsoft Project: Identify Project Management ConceptsNavigatetheMicrosoftProjectEnvironment

Module-2

Defining a Project: CreateaNewProjectPlanDefineaProject AssignaProjectCalendar

Module-3

CreatingandOrganizingTasks:
AddTaskstoaProjectPlan
Import Tasks from Other ProgramsCreateaWorkBreakdownStructureDefineTaskRelationships
ScheduleTasks

Module-4

ManagingProjectPlanResources: Add Resources to a Project PlanCreate aResourceCalendar
Enter Costs for ResourcesAssignResourcestoTasks
ResolveResourceConflicts

Module-5

FinalizingaProjectPlan:
OptimizeaProjectPlanSet aBaseline
ShareaProjectPlan

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:createanentireconstructionprojectschedulinginthesoftware.

References

- Marmel,E.,2011.*MicrosoftProject2007Bible*(Vol.767).JohnWiley& Sons.
- Larson, E. and Gray, C., 2013. *Project management: ThemanagerialprocesswithMSproject*.McGraw-HillEducation.
- Biafore,B.,2013.*Microsoftproject2013:Themissingmanual*."O'ReillyMedia,Inc.".
- Ambriz, R. and Landa, M., 2014. *Dynamic Scheduling® WithMicrosoft®Project2013:TheBookByandForProfessionals*.J.RossPublishing.

ENDOFISEMESTER

PROJECT MANAGEMENT–2			
CourseCode	20ACM21	CIEMarks	40
TeachingHours/Week(L:S:SDA)	4:2:2	SEEMarks	60
Credits	06	ExamHours	03

Module-1

Introduction to project management topics: Project Charter, ProjectManagement Plan, Project Management, Programme Management &PortfolioManagement,Stakeholder Management,ScopeManagement, ScheduleManagement,ChangeManagement.

Module-2

Introductiontoprojectmanagementtopics:CommunicationManagement, Procurement Management, Cost Management, QualityManagement,SafetyManagement,StrategyManagement.

Module-3

Introductiontoprojectmanagementtopics:ResourceManagement,ConflictManagement & Disputeresolution, ContractManagement,DesignManagement,BenefitsManagement,ProjectClosure.

Module-4

STAKEHOLDERMANAGEMENT:Definitionofstakeholder,Stakeholder category. Stakeholder groups-Team member, Executiveand other stakeholder. Stakeholder registry. Stakeholder management.Stakeholdercommunication,managingstakeholdersin virtualworld, Managingdifficultstakeholder.

Module-5

Construction Management: Introduction, Understand the role and theimportance of the construction manager to the project, constructionmanagerstasks,differencebetweenaconstructionmanagerandageneralorprimecontractorforaconstructionproject,Defined uediligence and how it applies to construction projects, Understand theconstructionmanagersroleincontractsigning,Carryoutthe constructionmanagersduties.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

Attheendofthecoursethestudentwillbeableto:understandthea pplication of Project Management skills at various aspects of theproject.

Questionpaperpattern:

TheSEEquestion paperwillbesetfor 100marksandthemarksscoredwillbeproportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequal marks.
- Eachfullquestionisfor20marks.
- Therewillbetwo fullquestions(withamaximumoffoursubquestions)fromeac hmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopic sunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingo nefullquestionfrom each module.

References

- AssociationforProjectManagement,2012.*APMbodyofknowledge*. Buckinghamshire: Association for ProjectManagement.
- Guide, A., 2017. *Project Management Body ofKnowledge(PMBOK®GUIDE)*.ProjectManagementInstitute.
- Dr.K.G.KrishnamurthyandS.V.Ravindra,2008.*ConstructionandProjectManagement*.
- Hendrickson, C., Hendrickson, C.T. and Au, T., 1989. *Projectmanagementforconstruction:Fundamentalconceptsforowners,engineers,architects,andbuilders*.ChrisHendrickson.
- Chris, H., 2003. Project Management for Construction:Fundamental Concepts for Owners, Engineers, Architects andBuilders.DepartmentofCivilandEnvironmentalEngineering.
- Punmia,B.C.andKhandelwal,K.K.,2002.*ProjectPlanningandControl withPERT&CPM*.Firewallmedia.
- Jha,K.N.,2015.*ConstructionProjectManagement:TheoryandPractice*. PearsonEducationIndia.
- Chitkara,K.K.,1998.*Constructionprojectmanagement*.Tata McGraw-HillEducation.

PROJECT SCOPE, SCHEDULE & COSTMANAGEMENT			
CourseCode	20ACM22	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:2:2	SEEMarks	60
Credits	05	ExamHours	03

Module-1

Project scope management: Define scope. Project scope managementoverview. Definition of scope of project. Product & Project scope.Collecting requirements. Prototype of requirements. The requirementsmanagement plan (RMP) Requirement tractability matrix documents(RTM). High level scope elicitation. Detailed requirement elicitation.WBS,OBS,Decomposition,Workpackage,Task.Scopebaseline.

Module-2

Project schedule management: Define schedule management. Schedulemanagement processes.Sequence activities. Activity dependencies.Leadsandlags,Floats,Estimatingactivityresourcing,Estimationactivityandprojecttime–Bottom-up,Topdown,AnalogousEstimating,ParametricEstimate,Three-pointEstimating,Resourcebreakdown structure,Reverse analysis.

Module-3

Preparing schedule, Activity on arrow, Activity on node. Critical pathmethod(CPM).Schedulecompression.Resourcelevelling.Ganttchart,Milestones.Schedulebaseline. 100% rule

Module-4

Project cost management: Define cost management. Cost estimating-Alternatives analysis. Reserve analysis. Cost of quality. Project budgetand forecasting. Cost estimations. Role of cost consultant. Lifecycle ofcosting.

Module-5

Project cost management: Earned value method (EVM). Earned valueschedule (EVS). Planned Value (PV), Earned value (EV), Actual cost(AC),BudgetatCompletion(BC).CostVariance(CV).ScheduleVariance(SV),VarianceatCompletion(VAC),CostPerformanceIndex(CPI),SchedulePerformanceIndex(SPI),Trendanalysis,EstimateAtCompletion(EAC),EstimatetoComplete(ETC).ToCompletePerformanceIndex (TCPI)

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

Attheendofthecoursethestudentwillbeableto:understandthescope of a project and plan a scheduling path as well as costmanagementplantoaproject.

Questionpaperpattern:
TheSEEquestion paperwillbesetfor 100marksandthemarksscoredwillbeproportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequal marks.
- Eachfullquestionisfor20marks.
- Therewillbetwo fullquestions(withamaximumoffoursubquestions)fromeac hmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopic sunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingo nefullquestionfrom each module.

References

- Demeulemeester, E.L. and Herroelen, W.S., 2006. *Projectscheduling:aresearchhandbook* (Vol.49).SpringerScience&BusinessMedia.
- Moustafaev, J., 2014. *Project scope management: A practicalguidetorequirementsforengineering,product,construction,ITandenterpriseprojects*.CRC Press.
- Callahan,M.T.,Quackenbush,D.G.andRowings,J.E.,1992.*Constructionproject scheduling*.
- Mubarak,S.A.,2015.*Constructionprojectschedulingandcontrol*.JohnWiley&Sons.
- Towey,D.,2013.*Costmanagementofconstructionprojects*.JohnWiley&Sons.
- Mubarak,S.A.,2015.*Constructionprojectschedulingandcontrol*.JohnWiley&Sons.

PROJECT RESOURCE MANAGEMENT-MATERIALS, EQUIPMENT & HUMAN RESOURCE MANAGEMENT			
CourseCode	20ACM23	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:0:4	SEEMarks	60
Credits	05	ExamHours	03

Module-1

Classificationandoperationalcharacteristicsofequipmentforearthmoving,hauling, hoisting,conveying,pneumatic,pumping,aggregateproduction,concreteproduction,piledriving,tunnelling and roadconstructionapplications.

Module-2

Planning,selectionandpurchaseofequipment,forearthmoving,hauling,hoisting,conveying,pneumatic,pumping,aggregateproduction,concreteproduction,piledriving,tunnellingandroadconstructionapplications.Newtrendsandconstructionequipmentof future.

Module-3

Systems of material classification and types of construction materials.ProcurementofMaterials,Materials&theirpeculiarities,materialplanning, accounting and material reconciliation. Basic of personnelmanagement,manpowerplanning,labourlawsand industrialrelations.
Theroleofpersonnelmanagementinconstructionenterprises.

Module-4

Concepts, definitions, growth,roleandfunctions,newdevelopmentsinHRDandHRM,manpowerestimationforcompanyandproject,methods and procedures of estimation at various stages. Methods ofrecruitment,selection,training,placement,financialcompensation, discipline,separationetc.inemployingandretainingengineersand managers.

Module-5

Role,functions,statusandrelationshipwithotherdepartments,personnel office records and procedures. Labour legislation, relatedlabouracts,grievancehandling,enquiryprocedure,Labour administrationandjudiciaryinregardtoconstructionindustry.

Note: Theabovetopicsshallbesupplementedwithsitevisitstomarqueeprojectswithinand outsidethecountry.

Courseoutcomes:
At the end of the course the student will be able to: understand theResourcemanagementofaprojectrelatedtoequipment,materials andhumanresource.

Questionpaperpattern:
TheSEEquestion paperwillbesetfor 100marksandthemarksscoredwillbeproportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequal marks.
- Eachfullquestionisfor20marks.
- Therewillbetwo fullquestions(withamaximumoffoursubquestions)fromeachmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopicsunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingonefullquestionfrom each module.

References

- Peurifoy,R.L.andLedbetter,W.B.,1985.Constructionplanning,equipment,andmethods (No.4thed.).
- Varma,M.,1975.ConstructionEquipmentanditsplanningand Application. Metropolitan Book Co.
- S.C.Sharma.,ConstructionEquipmentandManagement
- Bratton,J.andGold,J.,2017.Humanresourcemanagement:theoryandpractice.Palgrave.
- Deb,T.,2006.HumanResourceDevelopment:Theory&Practice.AneBooksIndia.
- Dainty,A.andLoosemore,M.eds.,2013.*Humanresourcemanagementinconstructionprojects*.Routledge.

MANAGEMENT INFORMATION SYSTEM & COMMUNICATION MANAGEMENT			
CourseCode	20ACM24	CIEMarks	40
TeachingHours/Week(L:S:SDA)	2:4:0	SEEMarks	60
Credits	04	ExamHours	--

Module-1

KeyDefinitions&ConceptofMIS.RoleandimpactofMIS.Computerapplication,filedesign,DBM,datacommunicationDocumentation,System designspecifications,Systemanalysisanddesign.Systemdevelopment, dataprocessingandflowchart

Module-2

DevelopmentandimplementationofMIS.Longrangeplan,Management of quality, MIS factors of success and failure. Impact ofcomputerapplication,Informationprocessingtechnology:Data processing,communicationandemerginginformationtechnology.

Module-3

CasestudiesofMISatcorporateandprojectlevel– BusinessApplications. Cash Flow forecasting of Projects using MIS. (Custom/Local)Introductionto CommunicationManagement.

Module-4

Elements and Function of Communication. Forms of Communications.CommunicationStrategies&Change.Corporate&MarketingCommunication.CRMwithMIS.

Module-5

StrategicCommunication,Globalcommunication,BrandCommunicationandPublicRelations.DigitalCommunicationSolutionsandMIS.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the end of the course the student will be able to: familiarize with thethe Management Information System & Communication Systems andtheirapplicationintheProject&ConstructionManagement Industry

References

- Banerjee,UtpalK.,*ManagementInformationSystem*,2nded.
- O'Brien,J.A.andMarakas,G.M.,2011.Managementinformationsystems.
- KatherineMiller,CommunicationTheories:perspectives,processes andcontexts
- JohnFiske,Introductiontocommunicationstudies.

LEGAL FRAMEWORK OF CONSTRUCTION			
CourseCode	20ACM25	CIEMarks	100
TeachingHours/Week(L:S:SDA)	2:0:0	SEEMarks	--
Credits	02	ExamHours	--

Module-1

Landacquisition,Act(1894,1984&2012/13)lease&easementrights, propertyactsandGunthewariacts.CityMasterPlans,Zoningregulatio nsand buildingbyelaws.

Module-2

NationalBuildingcode,RoleofZillaParishad&IRDPinruralhousing.Pe rmitsandapprovalforconstructionactivities;statutoryrequirements and clearance related to environment impact, urban form,fireregulation,completioncertificate.

Module-3

Laws and legislation related to construction Industry labour laws &consumer protection Act, MRTP act.Interpretation of various revenuedocumentssuchas:RTC,SurveyRecords,Pahani,Tippani,Aka rbandhetc.ConsumerForum,RERAActanditsimplications.NGTregul ations,RestrictionsonNon-AgriculturistpurchasingofLand,Land Ceilingact

Module-4

The building and construction workers (regulation of employment andconditionsofservice)Act,1996,workmen'scompensationAct.Pay mentofwagesAct,Theemployee'sprovidentfundandMiscellaneousp rovisionsAct1995etc.Indemnity&guarantee,Industrial act and Labour laws, Environmental laws.Types of disputesin construction contracts and methods of dispute resolution processes.Alternativedisputeresolutionanddisputereviewmechani sms.Arbitration andconciliationAct1996.

Module-5

Managerial approach to dispute minimization, Conduct of ArbitrationproceedingsMakingofArbitrationawardandTerminatio nproceedings, powers of arbitrator, case studies of arbitration award,setting aside of awards and enforcement of awards, appeal and revisionand court proceedings, introduction to civil & criminal procedure codewith special reference to laws & order at project sites, project policerelations

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the end of the course the student will be able to: provide anoverviewofalllawsandregulationsrelatedtoconstructionproj ects in the various stages of the project cycle.The coverageincludes Building regulation and bylaws of local authorities. Lawsrelatedtolanddevelopment.

References

- TheArbitrationandConciliationAct1996
- BuildingandEngineeringcontractsLawandPracticeby P.C.Makranda
- Kelley,G.,2012.*Constructionlaw:Anintroductionforengineers,arc hitects,andcontractors* (Vol. 94).JohnWiley&Sons.
- Adriaanse,M.J.,2016.*Constructioncontractlaw*.MacmillanI nternational HigherEducation.

PROFESSIONALELECTIVE2			
CourseCode	20ACM26	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	03	Exam Hours	--

20ACM261	ProjectRecovery
20ACM262	InternationalProjectManagement
20ACM263	ProjectScheduleManagement
20ACM264	Entrepreneurship

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the endof thecourse thestudentwillbe ableto:identify andspecialiseintheirareaofinterestunderConstructionProjectManagement.

PROFESSIONALELECTIVE2: Project Recovery			
CourseCode	20ACM261	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

UnderstandingSuccessandFailur
eCausesof ProjectFailure

Module-2

BusinesscaseFailure
Sponsorship/GovernanceFailures

Module-3

ProjectPoliticsandfailure
Softwarefailures

Module-4

SafetyConsiderationsSco
peCreep

Module-5

ProjectHealthChecks
TechniquesforRecoveringFailingProjects

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:Understandthevariou stechniquesforovercomingprojectfailures.

References

- Kerzner,H.,2014.*Projectrecovery:Casestudiesandtechniquesfor overcomingprojectfailure*.JohnWiley&Sons.
- Anthopoulos,L.G.,Kostavara,E.andPantouvakis,J.P.,2013.Aneff ectivedisasterrecoverymodelforconstruction projects.*Procedia-SocialandBehavioralSciences*,*74*(0),pp.21-30.
- Schultmann, F. and Sunke, N., 2007. Energy-orienteddeconstructionandrecoveryplanning.*BuildingR esearch&Information*,*35*(6), pp.602-615.
- Havelka,D.andRajkumar,T.M.,2006.Usingthetroubledprojectre coveryframework:problemrecognitionanddecisionto recover.*E-Servicejournal*,*5*(1),pp.43-73.

PROFESSIONALELECTIVE2:International Project Management			
CourseCode	20ACM262	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

IntroductiontoInternationalProjectManagement
EvaluatingofCountryRiskanditsimpactonProjectSelectionandManagement

Module-2

Managing Time, Cost, Scope and QualityBenefitsandRiskinInternational Projects

Module-3

LeadershipofInternationalProjects

Module-4

Managing,CommunicationandControllingInternationalProjectsRecruitmentand StaffingofInternationalProjects

Module-5

TheWiderContextofStakeholderAnalysisinInternationalProjects.
Cross-Culturalteamwork and leadershipteam.

Note: The abovetopicsshall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthe coursethestudent willbe ableto:UnderstandthekeyfeaturesofInternational ProjectManagement.

References

- Köster,K.,2009.*Internationalprojectmanagement*.Sage.
- Lientz,B.andRea,K.,2012.*Internationalprojectmanagement*.Routledge.
- Grisham, T.W., 2009. *International project management:Leadershipincomplexenvironments*.John Wiley&Sons.
- Mohammed,U.K.,Prabhakar,G.P.andWhite,G.,2008.Culturean dconflictmanagementstyleofinternational project managers.*InternationalJournalofBusinessManagement*,*3*(5), pp.3-11.
- Czuchry, A.J. and Yasin, M.M., 2003. Managing the projectmanagementprocess.*IndustrialManagement&DataSystems*.

PROFESSIONALELECTIVE2:Project Schedule Management			
CourseCode	20ACM263	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Define the Project Parameters: Project Planning and SchedulingSystem;ProjectPlanningand Scheduling;Task/Responsibility Matrix;Project Deliverables; Deliverables Approval Process; ProjectDependencies;ProjectAssumptions;ProjectScope;Project Stakeholders;ProjectFlexibilityMatrix.

Module-2

DeveloptheWorkBreakdownStructure: WorkBreakdown Structure

Module-3

DevelopPreliminaryEstimates andSchedules: PreliminaryCost;Estimates;Critical Path;PreliminarySchedules.

Module-4

OptimizetheProjectPlan: ApprovedProjectPlanAdjustments

Module-5

TransitiontoPlanManagement: Project PlanBaseline;ApprovedProjectPlan;ProjectExecutionStage;Launch Communication;ImplementedProject;OfficeProcessesand Procedures

Note: The abovetopicsshallbe supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
At the end of the course the student will be able to: Understand theconceptofScheduleManagementandbeabletodrawaworkbreakdown structureforaproject.

References

- Rumane,A.R.ed.,2016.*Handbookofconstructionmanagement:scope,schedule, andcostcontrol*.CRCPress.
- Mubarak,S.A.,2015.*Constructionprojectschedulingandcontrol*.John Wiley&Sons.
- Callahan,M.T.,Quackenbush,D.G.andRowings,J.E.,1992. *Constructionprojectscheduling*.
- Hardin, B. and McCool, D., 2015. *BIM and constructionmanagement:proventools,methods,andworkflows* .JohnWiley&Sons.

PROFESSIONALELECTIVE2:Entrepreneurship			
CourseCode	20ACM264	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Entrepreneurial Perspectives Introduction to Entrepreneurship – Evolution - Concept of Entrepreneurship - Types of Entrepreneurs - Entrepreneurial Competencies, Capacity Building for Entrepreneurs. Entrepreneurial Training Methods - Entrepreneurial Motivations - Models for Entrepreneurial Development - The process of Entrepreneurial Development.

Module-2

New Venture Creation Introduction, Mobility of Entrepreneurs, Models for Opportunity Evaluation; Business plans – Purpose, Contents, Presenting Business Plan, Procedure for setting up Enterprises, Central level - Startup and State level - T Hub, Other Institutions initiatives.

Module-3

Management of MSMEs and Sick Enterprises Challenges of MSMEs, Preventing Sickness in Enterprises – Specific Management Problems; Industrial Sickness; Industrial Sickness in India – Symptoms, process and Rehabilitation of Sick Units.

Module-4

Managing Marketing and Growth of Enterprises Essential Marketing Mix of Services, Key Success Factors in Service Marketing, Cost and Pricing, Branding, New Techniques in Marketing, International Trade.

Module-5

Strategic perspectives in Entrepreneurship Strategic Growth in Entrepreneurship, The Valuation Challenge in Entrepreneurship, The Final Harvest of New Ventures, Technology, Business Incubation, India way – Entrepreneurship; Women Entrepreneurs – Strategies to develop WomenEntrepreneurs, Institutions supporting Women Entrepreneurship in India.

Note: The abovetopicsshallbe supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the end of the course the student will be able to: Understand theconceptofScheduleManagementandbeabletodrawaworkbreakdown structureforaproject.

References

- *Entrepreneurship Development and Small Business Enterprises*, Poornima M. Charantimath, 2e, Pearson, 2014.
- *Entrepreneurship, a South – Asian Perspective*, D.F. Kuratko and T. V. Rao, 3e, Cengage, 2012.
- *Entrepreneurship*, Arya Kumar, 4 e, Pearson 2015.
- *The Dynamics of Entrepreneurial Development and Management*, Vasant Desai, Himalaya Publishing House, 2015.

PM SOFTWARE2			
CourseCode	20ACM27	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

IntroductiontoPrimaveraanditsframework Data,Navigating,and Layouts
EnterpriseProjectStructure CreatingaProject
CreatingaWorkBreakdownStructure

Module-2

Adding ActivitiesCreatingRelationshipsScheduling AssigningConstraints

Module-3

MaintainingtheProjectDocumentsLibrary FormattingSchedule Data
RolesandResources AssigningRoles

Module-4

AssigningResourcesandCosts Analyzing ResourcesOptimizingtheProject Plan

Module-5

Baselining the Project PlanProjectExecutionandControlReportingPerformance

Note: The abovetopics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:createanentireconstruction projectschedulinginthesoftware.

References

- Harris,P.E.,2016.*Planning&ControlUsingOraclePrimaveraP6 Versions 8, 15 & 16 PPM Professional*. Eastwood Harris PtyLtd.
- Winter,R.M.,2003.ConstructionSchedulingwithPrimavera ProjectPlanner.*Cost Engineering*, *45*(10), p.24.
- Williams,D.L.,2012.*OracleprimaveraP6Version8:Projectandportfoliomanagement*. Packt PublishingLtd.
- Kelly,S.D.,2012.*OraclePrimaveraContractManagementBiVersion14*.PacktPublishing Ltd.

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CONFLICT MANAGEMENT & DISPUTERE SOLUTION			
CourseCode	20ACM31	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:2:2	SEEMarks	60
Credits	05	ExamHours	03

Module-1

Definition of Conflict, Dispute, Conflict Management and Disputeresolution;Differencebetweenconflictanddispute;Typesof Conflict,Sources ofConflict.

Module-2

Conflict management Methodologies, Avoiding Conflict ResolutionStyle,CompetingConflictResolutionStyle,AccommodatingConflictResolution Style, Compromising Conflict Resolution Style,CollaboratingConflictResolution Style.

Module-3

ConflictAvoidance, Common conflicts and disputesobserved inaconstruction project; Dispute Resolution techniques; Types of Disputeresolution processes; Adjudicative and Consensual Processes; BindingandNon-BindingDisputeresolution;AlternateDisputeResolutionTechniques.

Module-4

BindingDisputeresolutiontechniques;AdjudicativeProcesses;Litigation, Characteristics of Litigation; Arbitration, Characteristics ofArbitration;Adjudication,CharacteristicsofAdjudication;Expertdetermination,Characteristicsof Expertdetermination.

Module-5

Module-5:
Non-BindingDisputeresolutiontechniques;ConsensualProcesses;Negotiation, Characteristics of Negotiation; Mediation, Characteristicsof Mediation; Conciliation, Characteristics of Conciliation; ExecutiveTribunal,CharacteristicsofExecutiveTribunal.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
At the end of the course the student will be able to: understand theapplicationofdisputeresolutiontechniquesandthesolutionstoaconflictinaproject.

Questionpaperpattern:
TheSEEquestion paperwillbesetfor 100marksandthemarksscoredwillbeproportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequal marks.
- Eachfullquestionisfor20marks.
- Therewillbetwo fullquestions(withamaximumoffoursubquestions)fromeachmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopicsunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingonefullquestionfrom each module.

References

- Fenn,P.,2012.*CommercialConflictManagementandDisputeResolution*. Routledge.
- Pena-Mora,F.A.,Sosa,C.E.andMcCone,D.S.,2003.Introductiontoconstructiondisputeresolution.
- Fiadjoe,A.,2013.*Alternativedisputeresolution:adevelopingworldperspective*. Routledge.
- Levin,P.ed.,2016,October.Constructioncontractclaims,changes,anddisputeresolution.AmericanSocietyofCivilEngineers.
- Fenn,P.F.andGameson,R.eds.,1992.*Constructionconflictmanagementandresolution*.Taylor& Francis.
- Fenn,P.,Lowe,D.andSpeck,C.,1997.Conflictanddisputeincontruction. *Construction Management & Economics*, *15*(6),pp.513-518.

PROJECT RISK MANAGEMENT			
CourseCode	20ACM32	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:2:2	SEEMarks	60
Credits	05	ExamHours	03

Module-1

Introduction,Riskmanagementprocess,RiskmanagementPlan,RiskAwareness,Natureof constructionRisks

Module-2

Importance of Risk, types of risks, quantifiable and unquantified risks,Classification of risks, Risk Identification methods (checklists, promptlists,brainstorming),Riskowneridentification.

Module-3

RiskManagement:Riskavoidance,Riskreduction,Risksharing,Risktransfer, Risk deference, Risk mitigation, Risk contingency, Riskinsurance, Riskacceptance.

Module-4

Risk assessment, Risk probability and Risk impact, Qualitative RiskAnalysis, Quantitative Risk analysis, Quantification of probability,Quantificationofimpact(severity),Exposurerating,RiskEvaluation.

Module-5

Risk Mitigation: Risk mitigation by elimination, reducing, transferring,avoiding,absorbingorpooling.Residualrisk,mitigationofunquantified risk, Risk Monitoring, Risk register, Software usage (ifany),Monitoringandreporting.

Note: The abovetopics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:understandthescope of a project and plan a scheduling path as well as costmanagementplantoaproject.

Questionpaperpattern:
TheSEEquestion paperwillbesetfor 100marksandthemarksscoredwillbeproportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequal marks.
- Eachfullquestionisfor20marks.
- Therewillbetwo fullquestions(withamaximumoffoursubquestions)fromeachmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopicsunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingonefullquestionfrom each module.

References

- Burtonshaw-Gunn,S.A.,2017.RiskandFinancialManagementinConstruction.
- Edwards,L.andEdwards,L.J.,1995.*Practicalriskmanagementin theconstructionindustry*.ThomasTelford.
- Cretu,O.,Stewart,R.B.andBerends,T.,2011.*Riskmanagementfor designandconstruction*(Vol.75).JohnWiley&Sons.
- Hopkin, P., 2018. *Fundamentals of risk management:understanding,evaluatingandimplementi ngeffectiveriskmanagement*.KoganPagePublishers.
- Smith,N.J.,Merna, T.andJobling,P.,2014.*Managingriskinconstructionprojects*. John Wiley&Sons.
- Loosemore,M.,Raftery,J.andReilly,C.,2006.*Riskmanagementinp rojects*.Taylor&Francis.

ADVANCED CONSTRUCTION TECHNIQUES			
CourseCode	20ACM33	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:0:4	SEEMarks	60
Credits	05	ExamHours	03

Module-1

ConceptualUnderstandingofvariouslargespanstructures,likeGeodesicdomes, hyperbolicparaboloids,andfreeformshapesetc.usedforAirports,Stadia,Industrial buildings,publicspacesetc.Constructiondetailsunderstanding,Servicesystems, StructuralSystems,Sequenceoferectionandfacilitatingmaintenanceofsuch structures.Identifyspecializedequipmentrequiredforerectionof suchstructures. Casestudiesofsuchstructuresandreporting.

Module-2

Study of advance building materials like Special alloys of steel & othermetals, glass, polymer, fabric, Various types of finishes & treatments,Constructionchemicals, speciallymanufactureditemsfrommanufacturers catalogues, etc. and specialized equipment required forerectionusedinerectionofstructuresmentionedinModule1above. Marketsurveyandcollectionofinformationaboutthematerials.

Module-3

ConceptualUnderstandingofHigh-risebuildingsinnormalandadverse conditions considering topography of the site, water-logging,marinestructures,et.Construction detailsunderstanding,Servicesystems,StructuralSystems,Sequenceoferectionand facilitatingmaintenanceofsuchstructures.Identifyspecializedequipmentrequired forerectionofsuchstructures.Casestudiesofsuchstructures andreporting.

Module-4

Conceptual Understanding of Pre-fabrication in building construction.Concept of Modular co-ordination. Construction details understanding,Servicesystems, StructuralSystems,Sequenceoferectionandfacilitatingmaintenance ofsuch structures.Essentialprocessofmanufacturing,handlingofpre-fabricated components.Identifyspecializedequipmentrequiredforerectionofsuchstructures.Case studiesofsuchstructuresandreporting.

Module-5

Conceptual Understanding of Demolition Techniques, Demolition byMachines,DemolitionbyExplosives,Advancedtechniques usingRoboticMachines,DemolitionSequence,DismantlingTechniques, Safety precaution in Demolition and Dismantling. Case studies of suchDemolition Techniquesandreporting.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the end ofthe course the student will be ableto:conceptuallyunderstandtheadvancedconstructiontechniquesusedforaconstructionproject.

Questionpaperpattern:

TheSEEquestion paperwillbesetfor 100marksandthemarksscoredwillbeproportionatelyreducedto60.

- Thequestionpaperwillhavetenfullquestionscarryingequal marks.
- Eachfullquestionisfor20marks.
- Therewillbetwo fullquestions(withamaximumoffoursubquestions)fromeac hmodule.
- Eachfullquestioncanhavesubquestionscoveringallthetopic sunderamodule.
- Thestudentswillhavetoanswerfivefullquestions,selectingo nefullquestionfrom each module.

References

- S.S.Ataev,"ConstructionTechnology",MirPublishers
- P. Dyanchenko& S. Mirotvorsky, "Prefabrication of ReinforcedConcrete",Mir Publishers
- HenrickNissen,"IndustrialBuildingandModularDesign",Cement ConcreteAssociation,London.
- R.Chudley,"ConstructionTechnology",(Vol.ItoIV)Longman
- RobertwadeBrown,"Practicalfoundationengineeringhandbook ",McGrawHillPublications.
- Patrick Powers. J., "Construction Dewatering: New Methods andApplications",JohnWiley&Sons.
- RoyChudley&RogerGreeno,"AdvancedConstructionTechniques ", PearsonPrenticeHall
- Peurifoy,"Construction Planning, Equipment&Method", TataMcGrawHallPub.
- SanksarS,SaraswatiS,"ConstructionTechnology",OxfordUnivers ityPress
- M.S.Shetty,"ConcreteTechnology:TheoryandPractice",S.ChandP ub.
- AllenE,Iano,J,"FundamentalsofBuildingConstruction",subscript ion E Book, Material and Method, John Wiley and Sons,2011.
- Cameron K. Andres, Ronald C. Smith, "Principles and Practices ofCommercialConstruction", 8thEd., PrenticeHall,2009.
- Gibb,A.G.,1999. *Off-sitefabrication:prefabrication,pre-assembly and43tilizing43on43n*.JohnWiley&Sons.

DISSERTATION STAGE–1			
CourseCode	20ACM34	CIEMarks	40
TeachingHours/Week(L:S:SDA)	3:2:2	SEEMarks	60
Credits	05	ExamHours	--

Courseobjectives:

- Supportindependentlearning.
- Guidetoselectandutilizeadequateinformationfromvaried resourcesmaintainingethics.
- Guidetoorganizetheworkintheappropriatemannerand presentinformation(acknowledgingthesources)clearl y.
- Developinteractive,communication,utilizing44on,time management,andpresentationskills.
- Impartflexibilityandadaptability.
- Inspireindependentandteamworking.
- Expandintellectualcapacity,credibility,judgement,intuition.
- Adheretopunctuality,settingandmeetingdeadlines.
- Instillresponsibilitiestooneselfandothers.
- Train students to present the topic of project work in aseminarwithoutanyfear,faceaudienceconfidently,enhan cecommunication skill, involve in group discussion to presentandexchangeideas.

Dissertation Stage-1: Students in consultation with the guide/s shallcarry out literature survey/ visit industries to finalize the topic of theProject. Subsequently, the students shall collect the material requiredfor the selected project, prepare synopsis and narrate the methodologytocarryout theprojectwork.

Seminar: Eachstudent,undertheguidanceofaFaculty,isrequiredto

- Presenttheseminarontheselectedprojectorallyand/o rthrough powerpointslides.
- Answerthequeriesandinvolveindebate/discussion.
- Submittwocopiesofthetypedreportwithalistofreferences.T

he participants shall take part in discussion to foster friendly andstimulating environment in which the students are motivated to reachhighstandardsandbecomeself-confident.

Courseoutcomes:

Attheendofthecoursethestudentwillbeableto:

- Demonstrateasoundtechnicalknowledgeoftheirselecte dprojecttopic.
- Undertakeproblemidentification,formulation,andsolution.
- Designengineeringsolutionstocomplexproblemsutilizing asystemsapproach.
- Communicatewithengineersandthecommunityatlargein writtenororal form.

Demonstrate the knowledge, skills and attitudes of a professional engineer.

ContinuousInternalEvaluation

CIEmarksshallbeawardedbyacommitteecomprisingofPrincipal/De an, PG Course Coordinator/HOD and Guide/Co-guide ofthedepartment.TheCIEmarksawardedforDissertationStage-1,shallbebasedontheevaluationofDissertationReport,DissertationP resentationskillandperformanceinQuestion-and-Answersessionin theratio50:25:25.

SEE(Universityexamination)shallbeaspertheUniversitynorms.

CONSTRUCTION QUALITY & SAFETY MANAGEMENT			
CourseCode	20ACM35	CIEMarks	100
TeachingHours/Week(L:S:SDA)	2:0:0	SEEMarks	--
Credits	02	ExamHours	--

Module-1

QUALITY MANAGEMENT: Quality policy in construction industry-ConsumersatisfactionErgonomics,TimeofCompletion-StatisticalTolerance-conceptofquality-Contractandconstructionprogramming-Inspectionprocedures,totalqualitycontrolconcept,sustainableconstructionmethods

Module-2

QUALITY ASSURANCE AND CONTROL: Total Quality AssuranceandQualityControlProgramandcostimplication.Different aspectsofquality Appraisals, failure mode analysis, Stability methods and tools,Influenceof drawings,detailing, specification,

Module-3

Qualityassuranceprotocols,workprocedurepreparation,advancedqualityprograms,Qualityauditandmonitoring,Qualitycircles.

Module-4

STANDARDIZATIONANDSAFETY:Standardization-BidPreparation-Constructionactivity,theSOPmethod,ConstructionSafety–Theory,meaningandscope.

Module-5

SAFETYPROGRAMMESANDORGANIZATION:Environmental safety,Socialandenvironmentalfactors,Hazardsinconstructionprojects, mitigation and preventive measures, OSHAAS guidelines forconstructionsafety,repercussionsofconstructionaccidents,constructionaccidentreporting,Contractualobligationsforconstructionsafety, EHSbudgeting.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the end of the course the student will be able to: understand thequalityandsafetymanagementmeasurestobeundertakeninaconstructionproject.

References

- ConstructionSafety(SafetyManagement)byD SGanguly& CSChangeriya
- QualityonSitebyFergusonIanand MitcheelEric
- Qualitymanagement-TheprojectManagersperspective.ByPatterson John
- Levitt,R.E.andSamelson,N.M.,1993. *Constructionsafetymanagement*.John Wiley&Sons.
- Zou,P.X.andSunindijo,R.Y.,2015.*Strategicsafetymanagementinconstructionandengineering*.John Wiley& Sons.
- Lingard,H.andRowlinson,S.M.,2005.*Occupationalhealthandsafetyinconstructionproject management*.Taylor&Francis.
- Rumane,A.R.,2016.*Qualitymanagementinconstructionprojects*.CrcPress.
- Howarth,T.andWatson,P.,2012.*Constructionquality management:Principles andpractice*.Routledge.

PROFESSIONAL ELECTIVE3			
CourseCode	20ACM36	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	03	Exam Hours	--

20ACM361	FacilityManagement
20ACM362	RealEstateManagement
20ACM363	InfrastructureManagement–Airports,Tunnelling, Marine/OffshoreConstruction
20ACM364	Value Engineering in Construction Management

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the endof thecourse thestudentwillbe ableto:identify andspecialiseintheirareaofinterestunderconstructionprojectmanagement.

PROFESSIONALELECTIVE2 : Facility Management			
CourseCode	20ACM361	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Facilitymanagement(FM)aspartofConstructionManagement

Module-2

Role and administrative functions of Supervisors. Firefighting - Basicrequirement for the work firefighting system, various components ofthefirefightingsystem,maintenancerequiredofthesystem,firelighting inhigh-risebuildings,commercial/industrialcomplexes, publicbuildings,checklistforfiresafety,firefighting.

Module-3

Lifts / elevators, escalators, permissions & procedures legal formalitiesfor Elevators, various types of lifts, working mechanisms of lift andescalators.Indianstandardcodesforplanning&installationsof elevator,inspection&maintenanceoflifts.

Module-4

PlumbingServices:BasicsofPlumbingsystems,RequirementofPlumbing works, Agency,Activity Flow chart for Plumbing work,Quality,checkingofmaterials.
WaterSupplydistributionsysteminhigh-risebuildings&othercomplexes, pumps and pumping mechanism, operation & maintenanceof fittings & fixturesofw/s.
Do's & Don'ts for water pipe networks. Modern Sewage TreatmentPlants.Landscaping&Horticulture,Buildingmaintenance management.

Module-5

Air-Conditioning andHeating:Flowchartsofairconditioning&heating. Centralized systems, monitoring working of the equipment,checklist ofInspection,Performancetesting.
Waterproofing, Damp proofing &Termite proofing. Working Procedure & stages of work of waterproofing for W.C., bathrooms,Terrace,Slopingroof,Basements,tanks.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:Understandtheconcept ofFacilityManagement anditsapplications.

References

- Jensen, P.A. and van der Voordt, T. eds., 2016. *Facilitiesmanagement and corporate real estate management as valuedrivers:howtomanageandmeasure addingvalue.*Taylor&Francis.
- Rondeau,E.P.,Brown,R.K.andLapides,P.D.,2012. *Facilitymanagement.*John Wiley&Sons.
- Roper,K.andPayant,R.,2014.*Thefacilitymanagementhandbook.*Amacom.

PROFESSIONALELECTIVE2: Real Estate Management			
CourseCode	20ACM362	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Real Estate Development: Fundamental concepts and techniques,recognizing institutional and entrepreneurial elements, issuesencounteredinvariousphasesofdevelopmentlikesiteevaluation andland procurement, development team assembly, market study anddevelopmentscheme,constructionandprojectmanagement,project marketingandhand-overofcompletedprojects.

Module-2

RealestateInvestmentsandFinancing: ProjectFeasibility,Development Financing, Asset Disposaland Redevelopment Options,Analyses of Development Sites and Case Studies, integrated case studyonaspecificdevelopmentproject,whichrequiresreviewing,analysing andresolvingtheproblemsorstrategicissues.

Module-3

UrbanPolicy&RealEstateMarkets: ImpactofGovernmentRegulations and Public Policies on Real Estate Markets, include urbanland rent and location theories, land use structures, community andneighbourhooddynamics,degenerationandrenewalinurbandynamics, private-public participation, government policies on publicandprivatehousing,andurbanfiscalpolicyincludingpropertytaxation,local governmentfinance.

Module-4

Corporate Real Estate Asset Management: Strategic plans to alignrealestateneedswithcorporatebusinessplans;Performancemeasurementtechniquestoidentifyassetacquisitionordisposal;methodsforenhancingvaluethroughalternativeuses,efficientspace utilizationorimprovingusersatisfaction.

Module-5

CommercialRealEstateAppraisal: Determinationofthecapitalization rates across different types of properties; Appraisal offreeholdandleaseholdinterests;Criticalanalysisofthevaluationapproachesadoptedforsecuritizedrealestate;Assetpricingmodels; investmentflexibilityandfutureredevelopmentopportunities.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:
Attheendofthecoursethestudentwillbeableto:Understandtheconcept ofRealEstateManagementanditsfinancing.

References

- Jensen, P.A. and van der Voordt, T. eds., 2016. *Facilitiesmanagement and corporate real estate management as valuedrivers:howtomanageandmeasure addingvalue*.Taylor&Francis.
- McMahan,J.,2006.*Thehandbookofcommercialrealestateinvesting*(pp.5-21).NewYork,NY:McGraw-Hill.
- Edwards, V. and Ellison, L., 2009. *Corporate propertymanagement:aligningrealestatewithbusinessstrategy*.JohnWiley& Sons.

PROFESSIONALELECTIVE2: Infrastructure Management– Airports, Tunneling Marine/ Off shore Construction			
CourseCode	20ACM363	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

IntroductiontoInfrastructureManagementanditsprocesses.Types ofInfrastructure Management: Airport, Tunnelling, Marine/ Offshore,RoadsandHighways.DifferencebetweenInfrastructureMa nagement andConstructionManagement

Module-2

LandSourcinganditsProcessesforInfrastructureProjects.

Module-3

InvestmentandFinancingforInfrastructureProjects.ViabilityGapFun ding,JV-PPP,Swiss-ChallengeModel,etc.

Module-4

ProjectPlanningandControlforInfrastructureProjects.

Module-5

SiteSafety&TrafficManagementforInfrastructureProjects.Labour,M aterial&Movement scheduling.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

At the end of the course the student will be able to: Understand theconceptofinfrastructureManagementwithrespectAirports,Tunn elling,Marine/Offshore,RoadsandHighwayInfrastructure.

References

- Das,P.C.ed.,1999.*Managementofhighwaystructures*.ThomasT elford.
- Adetola,A.andGoulding,J.,2016.Collaborativeframeworkforro ad infrastructure management. *Infrastructure AssetManagement*,*3*(2),pp.71-80.
- Kazda,A.andCaves,R.E.,2007.*Airportdesignandoperation*.Am sterdam:Elsevier.
- Kapur,A.,1995.*Airportinfrastructure:Theemergingroleofthepri vatesector*.TheWorldBank.
- Frangopol, D. and Tsompanakis, Y. eds., 2014. *Maintenance andsafetyofaginginfrastructure:Structuresandinfrastructuresb ookseries* (Vol. 10).CRCpress.
- Beulen, E., Van Fenema, P. and Currie, W., 2005. Fromapplication outsourcing to infrastructure management: Extendingtheoffshoreoutsourcingserviceportfolio.*EuropeanM anagementJournal*,*23*(2),pp.133-144.

PROFESSIONALELECTIVE2:Value Engineering in Construction Management			
CourseCode	20ACM364	CIEMarks	100
TeachingHours/Week(L:S:SDA)	1:2:0	SEEMarks	--
Credits	02	Exam Hours	--

Module-1

Introduction to value engineering (VE), definition, objectives of value engineering, reasons for unnecessary costs, VE techniques and methodology, interface with the other programs.

Module-2

Elements of the project budget, need for cost control, meaning of capitalization, capitalization process, and capitalized income approach to construction project budgeting.

Module-3

Life cycle cost (LCC) and building costs, LCC technology and examples, LCC methodology, LCC formats and analysis and weighted evaluation – application of LCC to buildings.

Module-4

Value engineering and total project management, level of effort, team selection, value engineering job plan, and work plan phases.

Module-5

Classifying function, defining function, project level function system technique (fast) diagram, creativity and fixation, interpersonal skills, generation of ideas, brainstorming, rules for brainstorming, Delphi technique, application of Delphi technique to civil engineering projects.

Note: The above topics shall be supplemented with site visits to marqueeprojectswithinandoutsidethecountry.

Courseoutcomes:

- Establish value engineering techniques and methodology
- Draw value engineering job plan and work plan phases
- Concept of Delphi techniques and rules for brainstorming

References

- Tenah, K.A. (1985). "The Construction Management Process", Reston Publishing Company, Inc. Virginia
- Dell'Isola, Alphonse (1997). "Value Engineering: Practical Applications." R.S. Means Company, Inc: Kingston, MA.
- Oberiender, G. D. (1993). "Project Management for Engineering and Construction". McGraw-Hill, Inc.: New York.

PROFESSIONAL TRAINING / INTERNSHIP			
CourseCode	20ACM37	CIEMarks	100
TeachingHours/Week(L:S:SDA)	--	SEEMarks	--
Credits	04	ExamHours	--

Courseobjectives:

Professional Training / Internship provide students the opportunity ofhands-on experience that includepersonal training, timeand stressmanagement,interactiveskills, presentations, budgeting, marketing,liabilityandriskmanagement,paperwork,equipmentordering,maintenance,respondingtoemergenciesetc.Theobjectives arefurther,

- Toputtheoryintopractice.
- Toexpandthinkingandbroadentheknowledgeandskillsacquired throughcourseworkinthefield.
- Torelateto,interactwith,andlearnfromcurrentprofessionalsinthefield.
- Togainagreaterunderstandingofthedutiesandresponsibilitiesof a professional.
- Tounderstandandadheretoprofessionalstandardsinthefield.
- Togaininsighttoprofessionalcommunicationincludingmeetings,memos,reading,writing,publicspeaking,research,clientinteraction,inputof ideas, andconfidentiality.
- Toidentifypersonalstrengthsandweaknesses.
- To develop the initiative and motivation to be a self-starter andworkindependently.

Professional Training /Internship: Students under the guidance ofinternal guide/s and external guide shall take part in all the activitiesregularly to acquire as much knowledge as possible without causinganyinconvenienceat theplaceofinternship.

Seminar: Eachstudent,isrequiredto

- Presenttheseminarontheinternshiporallyand/orthroughpower pointslides.
- Answerthequeriesandinvolveindebate/discussion.
- Submitthereportdulycertifiedbytheexternalguide.
- The participants shall take part in discussion to foster friendlyandstimulatingenvironmentinwhichthestudentsare motivatedtoreachhighstandardsandbecomeself-confident.

Courseoutcomes:

Attheendofthecoursethestudentwillbeableto:

- Gainpracticalexperiencewithinindustryinwhichtheinternshipisdone.
- Acquireknowledgeoftheindustryinwhichtheinternshipisdone.
- Applyknowledgeandskillslearnedtoclassroomwork.
- Developagreaterunderstandingaboutcareeroptionswhilemoreclearlydefiningpersonalcareergoals.
- Experiencetheactivitiesandfunctionsofprofessionals.
- Developandrefineoralandwrittencommunicationskills.
- Identifyareasforfutureknowledgeandskilldevelopment.
- Expandintellectualcapacity,credibility,judgment,intuition.
- Acquiretheknowledgeofadministration,marketing,financeandeconomics.

InternshipRequirements: Allthestudentshavetoundergomandatory internship of 8 weeks during the vacation between II and IIIsemesters.AUniversity examinationshallbeconductedduring IIIsemester and the prescribed internship credit shall be counted for thesame semester. Internship shall be considered as a head of passing andshall be considered for the award of degree. The students are requiredtosubmitperiodic progressreports oftheinternshipundertaken.
Internship Assessment: CIE marks shall be awarded by a committeecomprisingofPrincipal/Dean,PGCourseCoordinator/HODandGuide/co-guide. The CIE marks awarded for Internship, shall be basedontheevaluationofInternshipReport,InternshipPresentationskillandperformance in Question and Answer session in the ratio 50:25:25.Those,whohavenotpursued/completedtheinternshipshallbedeclared as fail in internship course and have to complete the sameduringsubsequentUniversityexaminationsaftersatisfyingtheinternship requirements. Internship SEE (University examination) shallbeasper the Universitynorms.

ENDOF IIISEMESTER

DISSERTATIONSTAGE-2			
CourseCode	20ACM41	CIEMarks	40
TeachingHours/Week(L:S:SDA)	12:6:10	SEEMarks	60
Credits	20	ExamHours	--

Courseobjectives:

- Tosupportindependentlearning.
- Toguidetoselectandutilizeadequateinformationfromvaried resources maintainingethics.
- Toguidetoorganizetheworkintheappropriatemannerandpresentinformation(acknowledgingthesources)clearly.
- Todevelopinteractive,communication,organisation,timemanagement,andpresentationskills.
- Toimpartflexibilityandadaptability.
- Toinspireindependentandteamworking.
- Toexpandintellectualcapacity,credibility,judgement,intuition.
- Toadheretopunctuality,settingandmeetingdeadlines.
- Toinstillresponsibilitiestooneselfandothers.
- To train students to present the topic of project work in aseminar without any fear, face audience confidently, enhancecommunication skill, involve in group discussion to presentandexchange ideas.

Dissertation Stage - 2: Each student of the project, shall involve incarrying out the project work in constant consultation with internalguide, co-guide, and/or external guide and prepare the project report asper thenormsavoidingplagiarism.

Courseoutcomes:

Attheendofthecoursethestudentwillbeableto:

- Presenttheproject andbeabletodefendit.
- Makelinksacrossdifferentareasofknowledgeandtogenerate, develop and evaluate ideas and information so as toapplytheseskills totheprojecttask.
- Habituatedtocriticalthinkinganduseproblemsolvingskills
- Communicateeffectivelyandtopresentideasclearlyandcoherentlyin boththewritten and oralforms.
- Workinateamtoachievecommongoal.
- Learnontheirown,reflectontheirlearningandtakeappropriateactionstoimproveit.

CIE marks shall be awarded by a committee comprising of Dean, PGcourse/HoDandGuide/co-guide ofthedepartment.TheCIEmarksawarded for Dissertation Stage 2, shall be based on the evaluation ofDissertation Report, Dissertation Presentation skill and performance inQuestion-and-Answer sessionintheratio50:25:25.

SEE shall be at the end of IV semester. Dissertation work evaluationandViva-Voceexamination(SEE),aftersatisfyingtheplagiarismcheck, shall be as per the University norms. The Jury shall comprise of3members,2externalexaminers,drawnfromacademiaaswellasthe industry(ifavailable)and1internalexaminer.

ENDOFIV SEMESTER