HINDUSTAN UNIVERSITY

HINDUSTAN INSTITUTE OF TECHNOLOGY & SCIENCE

(Estd. u/s 3 of the UGC Act, 1956)

Padur, Kancheepuram District - 603 103.

DEPARTMENT OF CIVIL ENGINEERING

Regulations Curriculum and Syllabus 2013

M.Tech.
CONSTRUCTION ENGINEERING AND MANAGEMENT

ACADEMIC REGULATIONS
(M.TECH./ M.B.A. / M.C.A.) (Full - Time / Part - Time)
(Effective 2013-14)

1. Vision, Mission and Objectives

1.1 The Vision of the Institute is "To make every man a success and no man a failure".

In order to progress towards the vision, the Institute has identified itself with a mission to provide every individual with a conducive environment suitable to achieve his / her career goals, with a strong emphasis on personality development, and to offer quality education in all spheres of engineering, technology, applied sciences and management, without compromising on the quality and code of ethics.

1.2 Further, the institute always strives

- To train our students with the latest and the best in the rapidly changing fields of Engineering, Technology, Management, Science & Humanities.
- To develop the students with a global outlook possessing, state of the art skills, capable of taking up challenging responsibilities in the respective fields.
- To mould our students as citizens with moral, ethical and social values so as to fulfill their obligations to the nation and the society.
- To promote research in the field of science, Humanities, Engineering, Technology and allied branches.

1.3 Our aims and objectives are focused on

- Providing world class education in engineering, technology, applied science and management.
- Keeping pace with the ever changing technological scenario to help our students to gain proper direction to emerge as competent professionals fully aware of their commitment to the society and nation.
- To inculcate a flair for research, development and entrepreneurship.

2. Admission

2.1 The admission policy and procedure shall be decided from time to time by the Board of Management (BOM) of the Institute, following guidelines issued by Ministry of Human Resource Development (MHRD), Government of India. The number of seats in each branch of the (M.TECH / M.B.A. / M.C.A.) programme will be decided by BOM as per the directives from Ministry of Human Resource Development (MHRD), Government of India and taking into account the market demands. Some seats for Non Resident Indians and a few seats for foreign nationals shall be made available.

2.2 The selected candidates will be admitted to the (M.TECH / M.B.A. / M.C.A.) programme after he/she fulfills all the admission requirements set by the Institute and after payment of the prescribed fees.

2.3 Candidates for admission to the first semester of the Master's Degree Programme shall be required to have passed an appropriate Degree Examination recognized by Hindustan University.

2.4 In all matters relating to admission to the (M.TECH / M.B.A. / M.C.A.). Programme, the decision of the Institute and its interpretation given by the Chancellor of the Institute shall be final.

2.5 If at any time after admission, it is found that a candidate has not fulfilled any of the requirements stipulated by the Institute, the Institute may revoke the admission of the candidate with information to the Academic Council.

3. Structure of the programme

3.1 The programme of instruction will have the following structure

i) Core courses of Engineering / Technology / Management.

ii) Elective courses for specialization in areas of student's choice

3.2 The minimum durations of the programmes are as given below:

Program	No. of Semesters
M.Tech.(Full-Time)	4
M.Tech.(Part -Time)	6
M.B.A. (Full - Time)	4
M.B.A. (Part - Time)	6
M.C.A.(Full - Time)	6
M.C.A.(Part -Time)	8

Every (M.TECH / M.B.A. / M.C.A.) programme will have a curriculum and syllabi for the courses approved by the Academic Council.

3.3 Each course is normally assigned certain number of credits. The following norms will generally be followed in assigning credits for courses.

- One credit for each lecture hour per week per semester
- One credit for each tutorial hour per week per semester
- One credit for each laboratory practical of three hours per week per semester.
- One credit for 4 weeks of industrial training and
- One credit for 2 hours of project per week per semester.

3.4 For the award of degree, a student has to earn certain minimum total number of credits specified in the curriculum of the relevant branch of study. The curriculum of the different programs shall be so designed that the minimum prescribed credits required for the award of the degree shall be within the limits specified below.

Program	Minimum prescribed credit range
M.Tech. (Full time / Part time)	75 - 85
M.B.A. (Full time / Part time)	85 - 95
M.C.A (Full time / Part time)	115 - 125

3.5 The medium of instruction, examination and the language of the project reports will be English.

4. Faculty Advisor

4.1 To help the students in planning their courses of study and for getting general advice on the academic programme, the concerned Department will assign a certain number of students to a Faculty member who will be called their Faculty Advisor.

5. Class Committee

5.1 A Class Committee consisting of the following will be constituted by the Head of the Department for each class:

(i) A Chairman, who is not teaching the class.

(ii) All subject teachers of the class.

(iii) Two students nominated by the department in consultation with the class.

The Class Committee will meet as often as necessary, but not less than three times during a semester.

The functions of the Class Committee will include:

(i) Addressing problems experienced by students in the classroom and the laboratories.

(ii) Analyzing the performance of the students of the class after each test and finding ways and means of addressing problems, if any.

(iii) During the meetings, the student members shall express the opinions and suggestions of the class students to improve the teaching / learning process.

6. Grading

6.1 A grading system as below will be adhered to.

Range of Marks	Letter Grade	Grade points
95-100	S	10
85 - 94	A	09
75- 84	B	08
65-74	C	07
55-64	D	06
50-54	E	05
< 50	U	00
	I (Incomplete)	–

6.2 GPA & CGPA

GPA is the ratio of the sum of the product of the number of credits C_i of course "i " and the grade points P_i earned for that course taken over all courses "i" registered by the student to the sum of Ci for all "i ". That is,

$$GPA = \frac{\sum_i C_i P_i}{\sum_i C_i}$$

CGPA will be calculated in a similar manner, at any semester, considering all the courses enrolled from first semester onwards.

6.3 For the students with letter grade I in certain subjects, the same will not be included in the computation of GPA and CGPA until after those grades are converted to the regular grades.

6.4 Raw marks will be moderated by a moderation board appointed by the Vice-Chancellor of the University. The final marks will be graded using an absolute grading system. The Constitution and composition of the moderation board will be dealt with separately.

7. Registration and Enrollment

7.1 Except for the first semester, registration and enrollment will be done in the beginning of the semester as per the schedule announced by the University.

7.2 A student will be eligible for enrollment only if he/she satisfies regulation 10 (maximum duration of the programme) and will be permitted to enroll if (i) he/she has cleared all dues in the Institute, Hostel & Library up to the end of the previous semester and (ii) he/she is not

debarred from enrollment by a disciplinary action of the University.

7.3 Students are required to submit registration form duly filled in.

8. Registration requirement

8.1 **(i)** A Full time student shall not register for less than 16 credits or more than 26 credits in any given semester.

8.1 **(ii)** A part time student shall not register for less than 10 credits or more than 20 credits in any given semester.

8.2 If a student finds his/her load heavy in any semester, or for any other valid reason, he/she may withdraw from the courses within three weeks of the commencement of the semester with the written approval of his/her Faculty Advisor and HOD. However the student should ensure that the total number of credits registered for in any semester should enable him/her to earn the minimum number of credits per semester for the completed semesters.

9. Minimum requirement to continue the programme

9.1 For those students who have not earned the minimum required credit prescribed for that particular semester examination, a warning letter to the concerned student and also to his parents regarding the shortage of his credit will be sent by the HOD after the announcement of the results of the university examinations.

10. Maximum duration of the programme

The minimum and maximum period for the completion of various programs are given below.

Program	Min. No. of Semesters	Max. No. of Semesters
M.Tech (Full - time)	4	8
M.Tech (Part - time)	6	10
M.B.A. (Full Time)	4	8
M.B.A. (Part Time)	6	10
M.C.A. (Full - Time)	6	12
M.C.A (Part -Time)	8	14

11. Temporary discontinuation

11.1 A student may be permitted by the Director(academic) to discontinue temporarily from the programme for a semester or a longer period for reasons of ill health or other valid reasons. Normally a student will be permitted to discontinue from the programme only for a maximum duration of two semesters.

12. Discipline

12.1 Every student is required to observe discipline and decorum both inside and outside the campus and not to indulge in any activity which will tend to bring down the prestige of the University.

12.2 Any act of indiscipline of a student reported to the Director (Academic) will be referred to a Discipline Committee so constituted. The Committee will enquire into the charges and decide on suitable punishment if the charges are substantiated. The committee will also authorize the Director(Academic) to recommend to the Vice-Chancellor the implementation of the decision. The student concerned may appeal to the Vice-Chancellor whose decision will be final. The Director (Academic) will report the action taken at the next meeting of the Council.

12.3 Ragging and harassment of women are strictly prohibited in the University campus and hostels.

13. Attendance

13.1 A student whose attendance is less than 75% is not eligible to appear for the end semester examination for that semester. The details of all students who have attendance less than 75% will be announced by the teacher in the class. These details will be sent to the concerned HODs and Director (Academic).

13.2 Those who have less than 75% attendance will be considered for condonation of shortage of attendance. However a condonation of 10% in attendance will be given on medical reasons. Application for condonation recommended by the Faculty Advisor, concerned faculty member and the HOD is to be submitted to the Director (Academic) who, depending on the merits of the case, may permit the student to appear for the end semester examination. A student will be eligible for this concession at most in two semesters during the entire degree programme. Application for medical leave, supported by medical certificate with endorsement by a Registered Medical Officer, should reach the HOD within seven days after returning from leave or, on or before the last instructional day of the semester, whichever is earlier.

13.3 As an incentive to those students who are involved in extra curricular activities such as representing the University in Sports and Games, Cultural Festivals, and Technical Festivals, NCC/ NSS events, a relaxation of up to 10% attendance will be given subject to the condition that these students take prior approval from the officer-in-charge. All such applications should be recommended by the concerned HOD and forwarded to Director (Academic) within seven instructional days after the programme/activity.

14. Assessment Procedure

14.1 The Academic Council will decide from time to time the system of tests and examinations in each subject in each semester.

14.2 For each theory course, the assessment will be done on a continuous basis as follows:

Test / Exam	Weightage	Duration of Test Exam
First Periodical Test*	10%	2 Periods
Second Periodical Test*	10%	2 Periods
Model exam	20%	3 hours
Seminar/ Assignments/Quiz	20%	
End - semester examination	50%	3 Hours

*** Best out of the two tests will be considered.**

14.3 For practical courses, the assessment will be done by the subject teachers as below:

(i) Weekly assignment/Observation note book / lab records - weightage 60%.

(ii) End semester examination of 3 hours duration including viva - weightage 40%

15. Make up Examination/model examination

15.1 Students who miss the end-semester examinations / model examination for valid reasons are eligible for make-up examination /model examination. Those

who miss the end-semester examination / model examination should apply to the Head of the Department concerned within five days after he / she missed examination, giving reasons for absence.

15.2 Permission to appear for make-up examination / model exam will be given under exceptional circumstances such as admission to a hospital due to illness. Students should produce a medical certificate issued by a Registered Medical Practitioner certifying that he/she was admitted to hospital during the period of examination / model exam and the same should be duly endorsed by parent / guardian and also by a medical officer of the University within 5 days.

16. Project evaluation

16.1 For Project work, the assessment will be done on a continuous basis as follows:

Review / Examination	Weightage
First Review	10%
Second Review	20%
Third Review	20%
End semester Examination	50%

For end semester exam, the student will submit a Project Report in a format specified by the Director (Academic). The first three reviews will be conducted by a Committee constituted by the Head of the Department. The end - semester examination will be conducted by a Committee constituted by the Controller of Examinations. This will include an external expert.

17. Declaration of results

17.1 A candidate who secures not less than 50% of total marks prescribed for a course with a minimum of 50% of the marks prescribed for the end semester examination shall be declared to have passed the course and earned the specified credits for the course.

17.2 After the valuation of the answer scripts, the tabulated results are to be scrutinized by the Result Passing Boards of PG programmes constituted by the Vice-Chancellor. The recommendations of the Result Passing Boards will be placed before the Standing Sub Committee of the Academic Council constituted by the Chancellor for scrutiny. The minutes of the Standing Sub Committee along with the results are to be placed before the Vice-Chancellor for approval. After getting the approval of the Vice-Chancellor, the results will be published by the Controller of Examination/ Registrar.

17.3 If a candidate fails to secure a pass in a course due to not satisfying the minimum requirement in the end semester examination, he/she shall register and re-appear for the end semester examination during the following semester. However, the sessional marks secured by the candidate will be retained for all such attempts.

17.4 If a candidate fails to secure a pass in a course due to insufficient sessional marks though meeting the minimum requirements of the end semester examination, wishes to improve on his/ her sessional marks, he/she will have to register for the particular course and

attend the course with permission of the HOD concerned and the Registrar. The sessional and external marks obtained by the candidate in this case will replace the earlier result.

17.5 A candidate can apply for the revaluation of his/her end semester examination answer paper in a theory course within 2 weeks from the declaration of the results, on payment of a prescribed fee through proper application to the Registrar/Controller of Examinations through the Head of the Department. The Registrar/ Controller of Examination will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Department. Revaluation is not permitted for practical courses and for project work.

17.6 The weightage for internal marks in finalizing results and grades shall be waived off after completion of 5 semesters.

18. Grade Card

18.1 After results are declared, grade sheet will be issued to each student, which will contain the following details:

(i) Program and branch for which the student has enrolled.

(ii) Semester of registration.

(iii) List of courses registered during the semester and the grade scored.

(iv) Semester Grade Point Average (GPA)

(v) Cumulative Grade Point Average (CGPA).

19. Class / Division

19.1 Classification is based on CGPA and is as follows:

CGPA $\geq$ 8.0 : **First Class with distinction**

6.5 $\leq$ CGPA < 8.0 : **First Class**

5.0 $\leq$ CGPA < 6.5 : **Second Class.**

19.2 (i) Further, the award of 'First class with distinction' is subject to the candidate becoming eligible for the award of the degree having passed the examination in all the courses in his/her first appearance within the minimum duration of the programme.

(ii) The award of 'First Class' is further subject to the candidate becoming eligible to the award of the degree having passed the examination in all the courses within the below mentioned duration of the programme.

Program	No. of Semesters
M.Tech.(Full-Time)	5
M.Tech.(Part -Time)	7
M.B.A. (Full - Time)	5
M.B.A. (Part - Time)	7
M.C.A.(Full - Time)	7
M.C.A.(Part -Time)	9

(iii) The period of authorized discontinuation of the programme (vide clause 11.1) will not be counted for the purpose of the above classification.

20. Transfer of credits

20.1 Within the broad framework of these regulations, the Academic Council, based on the recommendation of the transfer of credits committee so constituted by the Chancellor may permit students to earn part of the credit requirement in other approved institutions of repute and status in the country or abroad.

21. Eligibility for the award of (M.TECH / M.B.A. / M.C.A.) Degree

21.1 A student will be declared to be eligible for the award of the (M.TECH / M.B.A. / M.C.A.). Degree if he/she has

i) registered and successfully credited all the core courses,

ii) successfully acquired the credits in the different categories as specified in the curriculum corresponding to the discipline (branch) of his/her study within the stipulated time,

iii) has no dues to all sections of the Institute including Hostels, and

iv) has no disciplinary action pending against him/her.

The award of the degree must be recommended by the Academic Council and approved by the Board of Management of the University.

22. Power to modify

22.1 Notwithstanding all that has been stated above, the Academic Council has the right to modify any of the above regulations from time to time subject to approval by the Board of Management.

HINDUSTAN UNIVERSITY

M.Tech. CONSTRUCTION ENGINEERING AND MANAGEMENT

CURRICULUM 2013

SEMESTER I

S.No.	Code No.	Course Title	L	T	P	C	TCH
Theory							
1	PMA103	Probability And Statistics	3	1	0	4	4
2	PCM 101	Modern Structural Materials And Systems Design	4	0	0	4	4
3	PCM 102	Construction Equipment	4	0	0	4	4
4	PCM 103	Computer Applications in Construction Engineering and Planning	4	0	0	4	4
5	PCM 104	Advanced Concrete Technology	4	0	0	4	4
6	PCM 105	Construction Project Management	4	0	0	4	4
		Total				**24**	**24**

SEMESTER II

S.No.	Code No.	Course Title	L	T	P	C	TCH
Theory							
1	PCM 201	Construction Planning, Scheduling and Control	4	0	0	4	4
2	PCM 202	Advanced Construction Techniques	4	0	0	4	4
3	PCM 203	Project Formulation and Appraisal	4	0	0	4	4
4	PCM 204	Shoring, Scaffolding and Formwork	4	0	0	4	4
5	-	Elective-I	3	0	0	3	3
6	-	Elective-II	3	0	0	3	3
Practical							
7	PCM 205	Construction Software Lab	0	0	4	2	4
		Total				**24**	**26**

SEMESTER III

S.No.	Code No	Course Title	L	T	P	C	TCH
Theory							
1	-	Elective-III	3	0	0	3	3
2	-	Elective-IV	3	0	0	3	3
3	-	Elective-V	3	0	0	3	3
Practical							
4	PCM 301	Practical Training	-	-	-	2	-
5	PCM 302	Seminar	0	0	2	1	2
6	PCM 303	Project Work-Phase-I	0	0	12	6	12
		Total				**18**	**23**

SEMESTER IV

S.No.	Code No.	Course Title	L	T	P	C	TCH
Practical							
1	PCM 401	Project Work-Phase-II	0	0	24	12	24
		Total				**12**	**24**

LIST OF ELECTIVE COURSES

S.No.	Code No.	Course Title	L	T	P	C	TCH
1.	PCM 701	Construction Personnel Management	3	0	0	3	3
2.	PCM 702	Maintenance and Rehabilitation of Structures	3	0	0	3	3
3.	PCM 703	Energy Conservation Techniques in Building Construction	3	0	0	3	3
4.	PCM 704	Project Safety Management	3	0	0	3	3
5.	PCM 705	Quality Control and Assurance in Construction	3	0	0	3	3
6.	PCM 706	System Integration in Construction	3	0	0	3	3
7.	PCM 707	Management Information Systems	3	0	0	3	3
8.	PCM 708	Quantitative Techniques in Management	3	0	0	3	3
9.	PCM 709	Business Economics and Finance Management	3	0	0	3	3
10.	PCM 710	Contract Laws and Regulation	3	0	0	3	3

TOTAL NO. OF CREDITS = 78

SEMESTER - I

PMA103 PROBABILITY AND STATISTICS
Common to M.Tech (AME/CM/EE)

L	T	P	C
3	1	0	4

GOAL

The course will help the students to understand the concepts of probability and statistics and its applications in the field of construction management.

OBJECTIVES

The course should enable the students to

1. Understand the basic concepts of sampling distributions and estimation.
2. Learn about the testing of hypothesis.
3. Gain the knowledge in Analysis of variance.
4. Know the probability functions and the Random variables.
5. Learn about the basic concepts of linear programming.

OUTCOME

The students should be able to:

1. Use the sampling principlus in the field of construction management.
2. Find the significance of large samples by using hypothesis testing.
3. Implement the variance design principles in sampling.
4. Interpolate datas by using probability theories.
5. Explain linear programming in the field of construction management.

UNIT I SAMPLING DISTRIBUTIONS AND ESTIMATION 12

Sampling distributions - Point and interval estimates for population proportions, mean and variance - Maximum likelihood estimate method - Method of moments.

UNIT II TESTING OF HYPOTHESIS 12

Basic definitions of statistical hypothesis - Tests of significance for large samples - single proportion, difference of proportion, single mean and difference of mean - Small samples - t, Chi-square and F distributions.

UNIT III DESIGN OF EXPERIMENTS 12

Analysis of variance - One way and Two way Classifications. Completely randomized design - Randomized block design - Latin square design.

UNIT IV PROBABILITY AND RANDOM VARIABLES **12**

Discrete and Continuous random variables - Moments - Moment generating functions - Standard distributions - Binomial, Poisson, Geometric, Negative Binomial, Uniform, Normal, Exponential, Gamma and Weibull distributions - Two dimensional random variables - Joint, Marginal and Conditional distributions. Multiple and partial correlation and Regression.

UNIT V LINEAR PROGRAMMING **12**

Basic concepts - Graphical and Simplex method - Transportation problem - Assignment problem.

TOTAL: 60

REFERENCES:

1) Taha, H.A., "Operations Research - An Introduction ", Prentice Hall of India Ltd., 6th Edition, New Delhi, 1997.

2) Dr.A.Singaravelu, Dr.S.Siva Subramanian and Dr.C.Ramachandran, "Probability and Queuing Theory", Meenakshi agency, 20th edition, January 2013.

3) Kapur, J.N. and Saxena, H.C. "Mathematical Statistics ", S. Chand and Co. Ltd., New Delhi, 1997.

4) T.Veerarajan, "Probability, Statistics and Random Processes", Tata McGraw-Hill, second edition, 2006.

PCM 101 MODERN STRUCTURAL MATERIALS AND SYSTEMS DESIGN

L	T	P	C
4	0	0	4

GOAL

Knowledge about modern and innovative structural materials and concepts of smart /intelligent home systems would help students to enhance their standards to the current requirements in the construction domain in par with international standards.

OBJECTIVES

The course should enable the students to

1. Gain knowledge about special concrete.
2. Aware of the different metals.
3. Have a wide knowledge of composites.
4. Familiarizing with specialized materials.
5. Create innovative ideas in respect of smart and intelligent materials.

OUTCOME

The students should be able to

1. Make use of the high strength and high performance concrete according to the need.

2. Select the respective alloy steel, aluminum and use the components in the respective construction methods.
3. Use wide variety of polymer and composites for building components.
4. Understand numerous materials such as water proofing, admixtures from different manufacturers and select the best choice to the end application.
5. Apply their ideas in green house, energy efficient housing projects.

UNIT I CONCRETES **12**

High strength and High performance concrete-Fiber Reinforced concrete

UNIT II METALS **12**

New Alloy steels-Aluminum and its products-Other alloys

UNIT III COMPOSITES **12**

Plastics-Reinforced polymers-FRP-Cellular cores

UNIT IV OTHER MATERIALS **12**

Water proofing compounds-Non -weathering Materials-Flooring and Facade Materials.

UNIT V SMART AND INTELLIGENT MATERIALS **12**

Brief outline and uses

TOTAL = 60

TEXT BOOK:

1. Shan Somayaji, "Civil Engineering Materials ", 2nd Edition, Prentice Hall Inc., 2001

REFERENCES:

1. Mamlouk, M.S. and Zaniewski, J.P., "Materials for Civil and Construction Engineers", 2nd Edition, Prentice Hall Inc., 1999.
2. Derucher, K.Korfiatis. G. and Ezeldin, S., "Materials for Civil and Highway Engineers", 4th Edition, Prentice Hall Inc., 1999.
3. Aitkens, "High Performance Concrete ", McGraw Hill, 1999.

PCM 102 CONSTRUCTION EQUIPMENT

L	T	P	C
4	0	0	4

GOAL

To study the latest construction equipments used in the industry .It also helps to understand the basics of equipment management which includes cost control, maintenance and safety in equipment handling.

OBJECTIVES

The course should enable the students to.

1. Study the management of construction.
2. Be familiar with the Earthwork Equipments.
3. Be acquainted with the knowledge of other Construction Equipment.
4. Be familiar in the Materials Handling Equipment.
5. Be familiar with the Equipment for production of Aggregate and Concreting

OUTCOMES

The students will be able to :

1. Implement the management methods in the project in terms of control of cost, Maintenance and safety.
2. Make use of the different types of Earthwork equipments like tractors, motor graders, scrapers, front end waders and earth movers.
3. Select the particular equipments for Trenching, Tunneling, Drilling, Blasting, Compaction, Dewatering, Pumps and the Pile Driving.
4. Develop Awareness on Material Handling Equipment like Forklift, Portable Material Bins, Conveyors and Hauling Equipment
5. Gain Knowledge and use of Equipment in the Production of aggregate using crushers, accessories, and concrete batching and mixing plant.

UNIT I CONSTRUCTION EQUIPMENT MANAGEMENT 12

Identification-Planning-Equipment management in projects -Maintenance management-S Replacement-Cost control of equipment-Depreciation Analysis-Safety Management

UNIT II EQUIPMENT OF EARTHWORK 12

Fundamentals of earthwork operations-Earth moving operations-Types of Earthwork Equipment-Tractors, Motor Graders, Scrapers, Front end waders, Earth Movers

UNIT III OTHER CONSTRUCTION EQUIPMENT 12

Equipment for Dredging, Trenching, Tunneling, Drilling, Blasting-Equipment for compaction-Erection

Equipment-Types of pumps used in construction-Equipment for Dewatering and Grouting-Foundation and Pile Driving Equipment.

UNIT IV MATERIALS HANDLING EQUIPMENT 12

Forklifts and Related Equipment-Portable Material Bins-Conveyors-Hauling Equipment

UNIT V EQUIPMENT FOR PRODUCTION OF AGGREGATE AND CONCRETING 12

Crushers-Feeders-Screening Equipment-Handling Equipment-Batching and Mixing Equipment-Hauling, Pouring and Pumping Equipment-Transporters.

TOTAL = 60

TEXT BOOKS:

1. Peurifoy, R.L., Ledbetter, W.B.and Schexnayder, C., "Construction Planning, Equipment and Methods ", 7th Edition, McGraw Hill, Singapore, 2001.
2. Sharma S.C. "Construction Equipment and Management ", Khanna Publishers New Delhi, 1988

REFERENCES:

1. Deodhar, S.V. "Construction Equipment and Job Planning ", Khanna Publishers, New Delhi, 3rd Edition, 2007.
2. Dr. Mahesh Varma, "Construction Equipment and its Planning and Application ", Metropolitan Book Company, New Delhi - 1997.

PCM 103 COMPUTER APPLICATIONS IN CONSTRUCTION ENGINEERING AND PLANNING

L	T	P	C
4	0	0	4

GOAL

To attain knowledge in the field of Construction Engineering, Planning, Scheduling, Estimation, Inventory and Equipment handling, Execution and Successful Completion with in the time frame and budget allocated.

OBJECTIVES

The course should enable the students to

1. Understand the various Parameters of Software Package in the Construction Management.
2. Study the Optimization techniques.
3. Be familiar with Inventory problems.
4. Practice the Scheduling Applications.
5. Find out the Problems in Simulation and Decision making.

OUTCOMES

The students will be able to :

1. Apply the Knowledge in Data base Management, Spread Sheets in Construction.
2. Make decision in application to protection scheduling, equipment replacement, material transportation and work assignment problems.
3. Gain knowledge of Inventory Problems in Construction Engineering and software development.
4. Utilize the Knowledge in tools of Construction Management like PERT and CPM and PRIMAVEERA.
5. Take Decision in the Construction Engineering Projects.

UNIT I INTRODUCTION 5

Introduction to System Hardware-Languages-Database Management-Spread Sheets-Applications

UNIT II OPTIMIZATION TECHNIQUES 15

Linear, Dynamic and Integer Programming-Branch and Bound Techniques-Application to Production Scheduling, Equipment Replacement, Material Transportation and Work Assignment Problems-Software Development

UNIT III INVENTORY PROBLEMS 15

Deterministic and Probabilistic Inventory Models-Software Development

UNIT IV SCHEDULING APPLICATIONS 15

PERT and CPM-Software Development - Use of PRIMAVERA

UNIT V OTHER PROBLEMS 10

Decision Making-Bayes Theory-Simulation-Models

TOTAL = 60

TEXT BOOK:

1. Bily E. Gillet., "Introduction to Operation Research" - A Computer Oriented Algorithmic Approach, Tata McGraw Hill, 1990

REFERENCES:

1. Paulson, B.R., "Computer Applications in Construction ", McGraw Hill, 1995.
2. Feigenbaum. L., "Construction Scheduling With Primevera Project Planner ", Prentice Hall Inc., 2003.

PCM 104 ADVANCED CONCRETE TECHNOLOGY

L	T	P	C
4	0	0	4

GOAL

To achieve comprehensive knowledge in concrete technology which would help the students to match their skills in materials understanding with the current requirements of the construction industry.

OBJECTIVES

The course should enable the students to

1. To study about the properties of cement
2. To get exposure to different types of mineral and chemical admixtures.
3. To know about the properties of aggregates.
4. To understand the concept of mix proportioning of concrete.
5. To study about the durability related properties of concrete.

OUTCOME

The students will be able to :

1. The students will gain knowledge of constituents, manufacturing process and testing of cement.
2. Make proper choice of retarders, air entraining agents, plasticizers and other admixtures that should be used in concrete.
3. Choose proper testing methods and aware of codes available for aggregates.
4. Execute mix proportioning of concrete and become aware of influence of addition of fibre on concrete properties.
5. Develop knowledge of durability testing methods of concrete.

UNIT I CEMENT 12

Composition of OPC-Manufacture-Modified Portland cements-Hydration process of Portland cements-Structure of Hydrated cement Pastes

UNIT II ADMIXTURES 12

Mineral admixtures-Slags-Pozolanas and Fillers-Chemical Admixtures-Solutes Retarders-Air Entraining Agents-Water proofing compounds-Plasticizers and Super Plasticizers

UNIT III AGGREGATES 12

Shape and Mechanical properties-Absorption and Physical durability-Chemical stability and packing Characteristics.

UNIT IV FRESH CONCRETE 12

Workability-Mix proportioning-Mixes incorporating Fly-Ash Mixes for High performance concrete-Fibre reinforced concrete.

UNIT V PROPERTIES AND DURABILITY OF CONCRETE 12

Interfacial Transition zone-Fracture strength-Mechanical properties-High strength concrete-Shrinkage-Creep- Other properties.Basic consideration-Stability of constituents-Chemical Attack-Corrosion of Reinforcing steel.

TOTAL = 60

TEXT BOOK:

1. Neville, A.M., "Properties of concrete ", 4th edition, Longman, In printed.

REFERENCES:

1. Metha P.K. and Montreio P.J.M., "Concrete Structure Properties and Materials ", 2nd edition, Prentice Hall, 1998.
2. Mindaas and Young, "Concrete ", Prentice Hall, 1998.

PCM 105 CONSTRUCTION PROJECT MANAGEMENT

L	T	P	C
4	0	0	4

GOAL

To achieve comprehensive knowledge in Construction Project management which includes the concepts of Planning, Scheduling, Design, Construction, Material and Equipment Utilization Process.

OBJECTIVES

The course should enable the students to

1. Understand the Perspective of owner's.
2. Study the Project management of Organizing.
3. Become familiar with the Design and Construction Process.
4. Understand the Labour, Material and equipment utilization.
5. Get Awarness about the Cost Estimation in the Construction Project.

OUTCOMES

The students will be able to :

1. Develop knowledge of Construction Professional Services, Finance facilities, Legal and regulatory requirements, Role of contractors and Project Managers.
2. Gain knowledge on Professional Construction Management and interpersonal behavior in Project Organization, leadership and motivation.
3. Apply knowledge on Construction Planning , Computer Aided Engineering and Value Engineering, Feasibility Studies.

4. Analysis the labour productivity materials, Management, Materials Procurement, and delivery, Inventory control, Tradeoffs cost in material management, Choice of equipments and standard production rates.

5. Type of construction cost estimates, Unit-cost method of estimation, application of cost indices to estimating, allocation of construction cost overtime and estimation of operating costs.

UNIT I THE OWNER'S PERSPECTIVE 9

Introduction-The project life cycle-Major Types of Construction-Selection of Professional Services-Construction contractors-Financing of constructed facilities-Legal and regulatory Requirements-The changing Environment of the construction Industry-The Role Project Managers

UNIT II ORGANIZING FOR PROJECT MANAGEMENT 9

Project management-Trends in Modern Management-Strategic planning and project programming-Effects of project risks on organization-Organization of Project Participants-Traditional designer-Constructor sequence-Professional construction management-Owner-Builder-Operation-Turnkey operation-Leadership and Motivation for the Project team-Interpersonal behavior in project organization-perceptions of Owners and Contractors

UNIT III THE DESIGN AND CONSTRUCTION PROCESS 9

Design and construction as an integrated system-Innovation and technological Feasibility-Innovation and technological feasibility-Design Methodology-Functional Design-Physical Structures-Geo-Technical Engineering Investigation-Construction Site Environment-Value engineering-Construction Planning-Industrialized Construction and Prefabrication-Computer -Aided Engineering.

UNIT IV LABOUR, MATERIAL AND EQUIPMENT UTILIZATION 9

Historical Perspective-Labour Productivity-Factors Affecting Job-Site Productivity-Labor Relations in construction-Problems in collective bargaining-Materials Management-Materials Procurement and Delivery- Inventory control-Tradeoffs of cost in Material Management-Construction Equipment-Choice of Equipment and Standard production Rates-Construction Processes Queues and Resource Bottlenecks

UNIT V COST ESTIMATION 9

Costs Associated with Construction Facilities-Approaches to cost estimation-Type of construction cost estimates-Effects of scale on construction cost-Unit cost-Method of estimation-Methods for allocation of joint costs-Historical cost data-Cost indices-Applications of cost Indices to Estimating-Estimate based on Engineers List of Quantities-Allocation of Construction costs over time-Computer Aided cost Estimation-Estimation of operating costs.

TOTAL = 45

TEXT BOOKS:

1. Chris Hendrickson and Tung Au, "Project management for Construction - Fundamental Concepts for owners ", Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.

2. Chitkara, K.K. "Construction Project Management Planning ", Scheduling and Control, Tata McGraw Hill Publishing Co., New Delhi, 1998.

REFERENCES:

1. Frederick E.Gould, "Construction Project Management ", Wentworth Institute of Technology, Vary E.Joyce, Massachususetts Institute of Technology, 2001.
2. Choudhury, S., "Project Management ", Tata McGraw Hill Publishing Co., New Delhi, 2008.
3. Ernest E. Ludwig, "Applied project Engineering and Management", Gulf Publishing Co., Houstan, Texas, 1988.
4. Harold Kerzner, "Project Management - A systems Approach to Planning", Scheduling and Controlling, CBS Publishers & Distributors, Delhi, 9th Edition, 2006.
5. Joy P.K., "Total Project Management", The Indian Context, Macmillan, India Ltd., New Delhi, 1994.

SEMESTER II
PCM 201 CONSTRUCTION PLANNING SCHEDULING AND CONTROL

L	T	P	C
4	0	0	4

GOAL

To achieve comprehensive knowledge in planning, scheduling, estimation, inventory and equipment handling, cost monitoring, accounting, quality control and safety in construction projects.

OBJECTIVES

The course should enable the students to

1. Understand the basic concepts in construction planning.
2. Be able to familiarize the different methods of scheduling procedures.
3. Learn the cost control monitory methods and according.
4. Be acquainted with the knowledge of methods of quality control and about safety concern in construction.
5. Study the types of project information, its use and organization in databases.

OUTCOME

The students should be able to.

1. Apply the concepts of Planning for construction projects.
2. Make use of network scheduling techniques like CPM, PERT, PNA for Civil Engineering projects.
3. Apply the methods of cost control and avoid cost overrun for civil engineering projects.
4. Apply the techniques of quality control for the projects.
5. Gain knowledge on organization of project information in databases.

UNIT I CONSTRUCTION PLANNING 12

Basic concepts in the development of construction plans-choice of Technology and Construction method-Defining Work Tasks-Definition-Defining Precedence relationships among activities-Estimating Activity Durations-Estimating Resource Requirements for work activities-coding systems

UNIT II SCHEDULING PROCEDURES AND TECHNIQUES 12

Relevance of construction schedules-The critical path method-Calculations for critical path scheduling-Activity float and schedules-Presenting project schedules-Critical path scheduling for Activity-on-node and with leads, Lags and Windows-Calculations for scheduling with leads, lags and windows-Resource oriented scheduling-Scheduling with resource constraints and Precedence's-Use of Advanced Scheduling Techniques-Scheduling with uncertain durations-Calculations for Monte Carlo Schedule simulations-crashing and time/cost trade offs-scheduling in poorly structured problems-Improving the Scheduling process

UNIT III COST CONTROL MONITORING AND ACCOUNTING 12

The cost control problem-The project Budget-Forecasting for Activity cost control financial accounting systems and cost accounts-Control of project cash flows-Schedule control-Schedule and Budget updates-Relating cost and schedule information

UNIT IV QUALITY CONTROL AND SAFETY DURING CONSTRUCTION 12

Quality and safety Concerns in Construction-Organizing for Quality and Safety-Work and Material Specifications-Total Quality control-Quality control by statistical methods -Statistical Quality control with sampling by Attributes-Statistical Quality control by Sampling and Variables-Safety.

UNIT V ORGANIZATION AND USE OF PROJECT INFORMATION 12

Types of project information-Accuracy and Use of Information-Computerized organization and use of information-Organizing information in databases-relational model of Data bases-Other conceptual Models of Databases-Centralized databases Management systems-Databases and application programs-Information transfer and Flow.

TOTAL = 60

TEXT BOOKS:

1. Chitkara, K.K. "Construction Project Management Planning ", Scheduling and Control, Tata McGraw Hill Publishing Co., New Delhi, 1998.
2. Calin M. Popescu, Chotchai Charoenngam, "Project planning, Scheduling and Control in Construction: An Encyclopedia of Terms and Applications ", Wiley, New York, 1995.

REFERENCES:

1. Chris Hendrickson and Tung Au, "Project Management for Construction - Fundamentals Concepts for Owners ", Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.
2. Moder.J., C.Phillips and Davis, " Project Management with CPM ", PERT and Precedence Diagramming, Van Nostrand Reinhold Co., Third Edition, 1983.
3. Willis., E.M., " Scheduling Construction projects ", John Wiley and Sons 1986.
4. Halpin,D.W., " Financial and cost concepts for construction Management ", John Wiley and Sons, New York, 1985.

PCM 202 ADVANCED CONSTRUCTION TECHNIQUES

L	T	P	C
4	0	0	4

PREREQUISITE NIL

GOAL

To introduce the student to various advanced construction techniques and activities which includes underwater construction, concrete paving, bridges, tall structures, domes, tower transmission line etc.

OBJECTIVES

The course should enable the students to :

1. Gain knowledge of tunneling, piling and jacking techniques.
2. Be familiar with various underwater construction techniques.
3. Be acquainted with knowledge of construction techniques in tall structures.
4. Gain knowledge of construction techniques in special structures.
5. Be familiar with the repairing work techniques.

OUTCOME

The students will be able to:

1. Develop knowledge of various techniques involved in piling.
2. Aware of various construction activities involve in underground and under water.
3. Describe various types of concreting operation in tall structures, techniques involved in erection of large span structures and transmission line structures.
4. Aware of various market forms of construction sequences in some of the special structures like chimney, silos, sky scrapers etc.
5. Gain knowledge of repair and maintenances of foundation and dismantling techniques.

UNIT I SUB STRUCTURE CONSTRUCTION- TUNNELING AND PILING 12

Tunneling techniques-piling techniques- Box jacking -Pipe Jacking- driving diaphragm walls, sheet piles-laying operations for built up offshore system-shoring for deep cutting-Large reservoir construction with membranes and Earth system.

UNIT II SUB STRUCTURE CONSTRUCTION-UNDER WATER CONSTRUCTION 12

Under Water Construction of diaphragm walls and basement- -driving well and caisson-sinking cofferdam-cable anchoring and grouting- -well points-Dewatering and stand by Plant equipment for underground open excavation

UNIT III SUPER STRUCTURE CONSTRUCTION- TALL STRUCTURES 12

Techniques of construction for continuous concreting operation in Tall buildings of various shapes and Varying sections-Launching Techniques-Suspended from work-erection techniques of tall

structures, Large span structures-Launching techniques for heavy decks-insitu prestressing in high rise structures, areial transporting handling erecting light weight components on tall structures-erection of lattice towers and rigging of transmission line structures-Vacuum Dewatering of concrete flooring-Concrete paving technology.

UNIT IV SUPER STRUCTURE CONSTRUCTION- SPECIAL STRUCTURES 12

Construction sequences in cooling towers, Silos Chimney, Sky scrapers, bow string bridges, cable stayed bridges-Launching and pushing of box decks-Advanced construction Techniques in Offshore construction practice-construction sequence and methods in domes and prestress domes-Support structure for heavy Equipment and conveyor and machinery in heavy industries-erection of articulated structures, braced domes and space decks.

UNIT V REPAIR CONSTRUCTION 12

Mud jacking grout through slab foundation-micro piling for strengthening floor and shallow profile-pipeline laying-protecting sheet piles, screw anchors-sub grade water proofing under pining advanced techniques and sequence in demolition and dismantling.

TOTAL = 60

TEXT BOOK:

1. Robertwade Brown, "Practical foundation engineering hand book ", McGraw Hill Publications, 2nd Edition, 2000.

REFERENCES:

2. Patrick Powers. J., " Construction Dewatering: New Methods and Applications ", John Wiley and Sons, 3rd Edition, 2007.

3. Jerry Irvine, "Advanced Construction Techniques ", CA Rocketr, 1984.

PCM 203 PROJECT FORMULATION AND APPRAISAL

L	T	P	C
4	0	0	4

GOAL

This subject helps the students to understand the complete project formulation, appraisal process from project identification, to project clearance. It also give better exposure to the students in the area of appraisal, finance and PSP process.

OBJECTIVES

The course should enable the students to:

1. Have the idea of project formulation and preparation of detailed project report.
2. Aware of the project costing
3. Gain knowledge of project appraisal

4. Be acquainted with the knowledge of project financing.

5. Be familiar with the private sector participation.

OUTCOME

The students should be able to

1. Have wide knowledge in respect of the projects particularly infrastructure, World Bank projects, feasibility report, project clearances required.

2. Follow the method of cash flow in the projects and also have an idea of the investment and its value.

3. Understand the project appraisal and implement it in every stages of ongoing work and make decisions accordingly and to achieve the ultimate aim of profit.

4. Know about the requirement and source of finance to carry out the project and financial institutions.

5. Develop knowledge in respect of execution of infrastructure development project - BOT,BOLT,BOOT-technology transfer and foreign collaboration, scope of technology transfer

UNIT I PROJECT FORMULATION 12

Generation and Screening of Project Ideas-Project identification-Preliminary Analysis, Market, Technical, Financial, Economic and Ecological-Pre-Feasibility Report and its Clearance, Project Estimates and Techno-Economic Feasibility Report, Detailed Project Report-Different Project Clearances required.

UNIT II PROJECT COSTING 12

Project cash flows-Time value of Money-Cost of Capital

UNIT III PROJECT APPRAISAL 12

NPV-BCR-IRR-ARR-Urgency-pay back period-Assessment of Various Methods-Indian Practice of Investment Appraisals-International practice of Appraisal-Analysis of Risk-Different Methods-Selection of a Project and Risk Analysis in Practice

UNIT IV PROJECT FINANCING 12

Project Financing-Means of Finance-Financial Institutions-Special schemes-Key Financial Indicators

UNIT V PRIVATE SECTOR PARTICIPATION 12

Private sector participation in Infrastructure Development Projects-BOT,BOLT,BOOT-Technology Transfer and Freign Collaboration-Scope of Technology Transfer

TOTAL = 60

TEXT BOOKS:

1. Prasanna Chandra, "Pojects-Planning Analysis Selection Implementation & Review 6th Edition",Tata Mc Graw Hill Publishing Co., Ltd., New Delhi., 2006.

2. Joy.P.K.,, "Total Project Management - The Indian Context (Chapters 3- 7) ", New Delhi , Macmillan India Ltd., 2006.

REFERENCES:

1. United Nations Industrial Development Organisation (UNIDO) "Manual for the preparation of Industrial Feasibility Studies ", (IDBI Reproduction) Bombay, 1987.
2. Barcus,S.W. and Wilkinson J.W., " Handbook of Management Consulting Services ", McGraw Hill, New York, 1986.

PCM 204 SHORING, SCAFFOLDING AND FORMWORK

L	T	P	C
4	0	0	4

GOAL

This subject help the students to understand the appropriate shoring scaffolding and formwork components in respect of structural elements. While handling scaffolds, the students also get exposed to safety practices.

OBJECTIVES

The course should enable the students to

1. Be familiar with the planning and detailing the forms.
2. Be aware of shores
3. Have a wide knowledge of slip form and safety practices for scaffolds
4. Create knowledge of formwork design and causes of its failure
5. Be acquainted with the knowledge of materials and site equipments.

OUTCOME

The students should be able to

1. To make proper planning comparing the need and specification of various elements requirements and measurements during the projects.
2. Gain knowledge of different types of shores, site preparation, load distribution for different types of construction activities.
3. To use the slip form in the building according to code provisions with safety requirements
4. Apply the techniques to all structural components of substructures and super structures in specialized constructions in respect to load distribution design, quality of work and safety factors in the actual field .
5. Be aware of new material and fasteners to use these wooden boards in respective building components while doing construction practices.

UNIT I PLANNING 10

Overall planning-Detailed Planning-Standard units-Corner units - Schedule for column form work-Formwork Elements-Planning at tender stage-Development of basic system-Planning for maximum

reuse-Economical form construction-Planning examples-crane size, effecting scheduling Estimate-Recheck plan details-Detailing the forms.

UNIT II SHORES 10

Simple wood stresses-Slenderness ratio-Allowable load-Tubular steel shores patented shores-Site preparation, Size and spacing-Steel Tower Frames-Safety practices-Horizontal shores shoring for multistories-More concentrated shore loads T-heads-Tow Tier Wood shores-Ellis Shores-Dayton sure grip and baker Ross shores-Safeway Symons shores-Beaver-advanced shores dead shore-Raking and Flying shores.

UNIT III SLIP FORMS AND SAFETY PRACTICES FOR SCAFFOLDS 10

Principles-Types-Advantages-Functions of Various components-Planning-Desirable Characteristics of concrete-common problems faced-Safety in slip forms special structures built with slip form technique-Codal provisions- Types of Scaffolds-Putlog and independent Scaffold-Single pole scaffolds-Fixing ties-Spacing of ties plan-Bracing-Knots-Safety net-General safety requirements-precautions against particular hazards-Truss suspended-Gantry and system scaffolds.

UNIT IV FORMWORK DESIGN AND CAUSES OF ITS FAILURE 20

Basic simplification-Beam formulae-Allowable stress-Deflection bending-Lateral stability-Shear, Bearing-Examples in wall forms-Slab forms-Beam forms-Ties, Anchors and Hangers-Column forms-Building and Erecting framework-Footings-Wall footings slopped footing forms-slab on grade and paving work-Highway and airport paving-curb and gutter forms-Wall forms -Giant forms curved wall forms-Wall openings joints-Tolerance for walls-Column heads-Beam forms- Suspended forms- Concrete joint construction-Flying system forms- Domes Forms- Hemispherical, Parabolic, Translational typical barrel vaults, Hyperbolic Folded plates-Shell form Design Consideration loads- Tunnel forming components-Curb forms invert forms-Arch forms-Concrete placement methods- Cut and cover construction-General design considerations- Pressure on Form-Concrete density-Height of discharge-Temperature-Rates of placing-consistency of concrete-Live loads and wind pressure-Vibration hydrostatic pressure and pressure distribution- Causes of failures-Inadequate shoring inadequate bracing of members-Improper vibration-Premature stripping- Errors in design-Failure to follow codes-How formwork affects concrete quality-Safety factors.

UNIT V MATERIALS AND SITE EQUIPMENT 10

Lumber-Types-Finish-Sheathing boards working stresses-Repetitive member stress-Plywood-Types and grades- Textured surfaces and strength-Reconstituted wood-Steel-aluminum form lining materials-Hardware and fasteners-Nails in plywood-Bolts lag screws and connectors-Bolt loads- Crane arrangements-site layout plan-Transporting plant-Formwork beams-Formwork ties-Wales and ties-Scaffold frames from accessories-Vertical transport table form work.

TOTAL = 60

TEXT BOOKS:

1. Robert L.Peurifoy and Garold D.Oberiender, "Formwork For concrete Structures ", McGraw-Hill, 1996.

2. Hurd.M.K., "Formwork for concrete ", Special Publication 7th Edition, American Concrete Institute, Detroit, 2005.

REFERENCES:

1. Michael P. Hurst, "Construction Press ", London & NewYork, 1997.
2. Austin, C.K., "Formwork for concrete ", Cleaver - Hume Press Ltd., London, 1996.
3. Tudor Dinescu and Constantin Radulescu, "Slip Form Techniques ", Abacus Press, Turn Bridge Wells, Kent, 1992.
4. Guide for concrete formwork, American concrete institute, Detroit, Michigan, 1996.
5. Safety Requirements for Scaffolding, "American National Standards Institute ", New York, 10018, 1994.

PCM 205 CONSTRUCTION SOFTWARE LABORATORY

L	T	P	C
0	0	4	2

GOAL

To become conversant with tools of network drawing, scheduling, and estimation for successful completion with in the time frame and budget allocated using software PRIMAVERA.

OBJECTIVES

The course should enable the students to:

1. Understand the concepts of network drawing and critical path scheduling using PRIMAVERA.
2. Know about the cost of buildings.

OUTCOMES

The student should be able to:

1. Apply methods of scheduling using network techniques for civil engineering projects.
2. Execute resource estimation and allocation and cost control for civil engineering projects.

1. SCHEDULING - NETWORK DRAWING

   Calculations for critical path scheduling

2. ESTIMATION OF BUILDINGS

   Resource allocation - Budgeted cost analysis

SOFTWARE REQUIRED

1. PRIMAVERA Software.

ELECTIVES
PCM 701 CONSTRUCTION PERSONNEL MANAGEMENT

L	T	P	C
3	0	0	3

GOAL

In construction industry labour force is the main source of activity which is to be monitored effectively. So that the output is maximum. In Human Resource management, students will be able to manages the challenges in handling manpower in the construction industry.

OBJECTIVES

The course should enable the students to:

1. Create the knowledge of manpower planning
2. Understand the various types of Organization
3. Be Familiar with the human behaviors
4. Create Awareness of welfare measures.
5. Be acquainted with the knowledge of management and development methods.

OUTCOME

The students should be able to:

1. Understand the manpower planning, organizing, controlling in human resource management.
2. Make use of the knowledge in respect of charts, staffing, plan and development, placement and training in actual field
3. To implement the basic psychology, motivation, performance, managing groups, behavioral aspects of decision making in real situations
4. As a project manager, he can become aware of his duty to ensure safety and health in addition to individual benefits in terms of compensation, GPF, laws related to welfare measures.
5. Apply these methods in managing the special human resource problems, employee appraisal and assessment in the construction industry.

UNIT I MANPOWER PLANNING 6

Manpower Planning, Organizing, Staffing, directing and Controlling-Personnel Principles.

UNIT II ORGANISATION 10

Organization-Span of control-Organization charts-Staffing plan-Development and Operation of Human resources-Managerial Staffing-Recruitment-Selection-Placement, Training and Development

UNIT III HUMAN BEHAVIOUR 12

Introduction to the field of management-basic individual psychology-motivation-job design and performance management-Managing groups at work-self managing work teams-Inter group behaviour and conflict in organizations-Leadership- Behavioral aspects of decision-making; and communication for people management

UNIT IV WELFARE MEASURES **5**

Compensation - Safety and Health- GPF- EPF- Group- Insurance- Housing- Pension- Laws- related to welfare measures.

UNIT V MANAGEMENT AND DEVELOPMENT METHODS **12**

Compensation-Wages and Salary, Employee Benefits ,employee appraisal and assessment-Employee services-Safety and Health-Discipline and Discharge-Special human resource problems, Performance appraisal-Employee hand book and personnel manual-Job descriptions and organization structure and Human relations-Productivity of Human resources

TOTAL = 45

TEXT BOOKS:

1. Carleton Counter II and Jill Justice Coulter, "The Complete Standard Hand Book of Construction Personnel Management", Prentice Hall, Inc., New Jersey, 1989.
2. Memoria, C.B., "Personnel Management ", Himalaya Publishing Co., 1999.

REFERENCES:

1. Josy.J Familaro, "Handbook of Human Resources Administration", McGraw Hill International Edition, 1987.
2. Pringle Charles, "Management Longnecker " Emerricle Publishing Co., 1981.
3. R.S.Dwivedi, "Human Relations and Organisational Behaviour ", 5th Edition, BH - 2005.

PCM 702 MAINTENANCE AND REHABILITATION OF STRUCTURES

L	T	P	C
3	0	0	3

PREREQUISITE Nil

GOAL

To introduce the student to concrete quality, durability aspects, causes of deterioration and demolition procedure.

OBJECTIVES

The course should enable the students to :

1. Able to introduce to quality assurance for concrete construction.
2. Be familiar with serviceability and durability of concrete structures.
3. Gain knowledge of maintenance and repair strategies.
4. Be familiar with the properties of materials & repair techniques.
5. Throw light on engineered demolition techniques.

OUTCOME

The students will be able to :

1. Develop knowledge of concrete quality and various properties of concrete.
2. Gain knowledge of various mechanics involved in serviceability and durability of structures.
3. Aware of various procedure and techniques in repair and rehabilitation.
4. Gain knowledge of material and techniques in repair work.
5. Describe case studies involved in dilapidated structures.

UNIT I GENERAL 12

Quality assurance for concrete construction as built concrete properties strength, permeability, thermal properties and cracking.

UNIT II INFLUENCE ON SERVICEABILITY AND DURABILITY 12

Effects due to climate, temperature, chemicals, wear and erosion, Design and construction errors, corrosion mechanism, Effects of cover thickness and cracking, methods of corrosion protection, corrosion inhibitors, corrosion resistant steels, coatings, cathodic protection.

UNIT III MAINTENANCE AND REPAIR STRATEGIES 12

Definitions : Maintenance, repair and rehabilitation, Facets of Maintenance importance of Maintenance Preventive measures on various aspects Inspection, Assessment procedure for evaluating a damaged structure causes of deterioration - testing techniques.

UNIT IV MATERIALS AND TECHNIQUES FOR REPAIR 12

Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, ferro cement, Fibre reinforced concrete. Rust eliminators and polymers coating for rebars during repair foamed concrete, mortar and dry pack, vacuum concrete, Gunite and Shotcrete Epoxy injection, Mortar repair for cracks, shoring and underpinning. Repairs to overcome low member strength, Deflection, Cracking, Chemical disruption, weathering wear, fire, leakage, marine exposure..

UNIT V ENGINEERED DEMOLITION TECHNIQUES 12

Engineered Demolition techniques for dilapilated structures - Case studies.

TOTAL = 60

TEXT BOOKS:

1. Denison Campbell, Allen and Harold Roper, "Concrete Structures", Materials, Maintenance and Repair, Longman Scientific and Technical UK, 1991.
2. R.T.Allen and S.C.Edwards, "Repair of Concrete Structures", Taylor & Francis, 1993.

REFERENCES:

1. M.S.Shetty, "Concrete Technology - Theory and Practice ", S.Chand and Company, New Delhi, 6th Edition, 2005.

2. Santhakumar, A.R., "Training Course notes on Damage Assessment and repair in Low Cost
3. Housing ", "RHDC-NBO "Anna University, July, 1992.
4. Raikar, R.N., "Learning from failures - Deficiencies in Design ", Construction and Service - R & D Centre (SDCPL), Raikar Bhavan, Bombay, 1987.
5. N.Palaniappan, "Estate Management, Anna Institute of Management ", Chennai, 1992.
6. Lakshmipathy, Metal Lecture notes of Workshop on "Repairs and Rehabilitation of Structures", 29 - 30th October 1999.

PCM 703 ENERGY CONSERVATION TECHNIQUES IN BUILDING CONSTRUCTION

L	T	P	C
3	0	0	3

GOAL

Enable the students to know about energy conservation techniques in building construction which includes smart utilization of alternate sources of energy for buildings, green building concepts and energy management concepts which is the need of the day.

OBJECTIVES

The course should enable the students to:

1. Introduce to energy usage in buildings, and energy production systems.
2. Know the design of green buildings and various waste management methods.
3. To study energy efficient design strategies
4. Gain ideas of various conservative measures
5. To study about different methods of energy methods of energy management.

OUTCOME

The students should be able to

1. Know the importance of energy conservation especially in commercial and industrial units.
2. Get an idea about the importance of waste management techniques to be used.
3. Use advanced technologies in building construction which are eco-friendly.
4. Know the methods of energy management which are highly required in construction industry.
5. Handle energy savings in lighting systems which is a main constitute to the total power use.

UNIT I INTRODUCTION 6

Fundamentals of Energy-Energy production systems-Heating, Ventilating and Air conditioning-Solar Energy and conservation-Energy Economic Analysis-Energy conservation and audits-Domestic energy consumption-Savings-Challenges-Primary energy use in buildings-Residential-commercial-Institutional and public buildings.

UNIT II ENVIRONMENTAL **7**

Energy and resource conservation-Design of green buildings-Evaluation tools for building energy-Embodied and operating energy-Peak demand-Comfort and indoor air quality-Visual and acoustical quality-Land, water and materials-Airborne emissions and Waste management

UNIT III DESIGN **8**

Natural building design consideration-Energy efficient design strategies-Contextual factors-Longevity and process assessment-Renewable energy sources and design-Advanced building technologies-Smart buildings-Economies and cost analysis

UNIT IV SERVICES **12**

Energy in building design-Energy efficient and environmental friendly building-Thermal phenomena-Thermal comfort-Indoor air quality-Climate, Sun and solar radiation-Psychometrics-Passive heating and cooling systems- Energy analysis -Active HVAC systems-Preliminary investigations-Goals and policies-Energy audit-Types of Energy audit-Analysis of results-Energy flow diagram-Energy consumption/Unit production-Identification of wastage-Priority of conservative measures-Maintenance of energy management program.

UNIT V ENERGY MANAGEMENT **12**

Energy management of electrical equipment-Improvement of power factor-Management of maximum demand-Energy savings in pumps-Fans-Compressed air systems-Energy savings in lighting systems-Air conditioning systems-Applications-Facility operation and maintenance-Facility modifications-Energy recovery dehumidifier-Waster heat recovery-Steam plants and distribution systems-Improvement of boiler efficiency-Frequency of blow down-Steam leakage-Steam flash and condense return.

TOTAL = 45

TEXT BOOK:

MooreF., "Environmental control systems", McGraw Hill, Inc., 1994

REFERENCES:

1. Brown, G.Z, Sun, " Wind and Light: Architectural design Strategies ", John Wiley & Sons, 1985.
2. Cook, J, "Award - Winning Passive Solar Design ", McGraw Hill, 1984.

PCM 704 PROJECT SAFETY MANAGEMENT

L	T	P	C
3	0	0	3

GOAL

This subject gives exposure to the students about various construction accidents, their causes and preventive measures to be taken. Safety programmes and contractual obligations for safety in construction contracts are highlights of this subject.

OBJECTIVES

The course should enable the students to :

1. Be familiar with construction accidents.
2. Understand the elements of safety program.
3. Be acquainted with the knowledge of safety in construction contracts.
4. Understands the design for safety.
5. Be familiar with the role of owner & designer in construction safety.

OUTCOMES

The student will be able to :

1. Describe the importance of safety and know the legal implications if safety is not followed at site.
2. Execute a proper safety program for construction project.
3. Apply safety parameter in construction contract documents.
4. Describe the responsibilities of different level of workers with regard to safety for a construction project.
5. Gain knowledge on selection of safe contractors and designer who will pay more attention to safety.

UNIT I CONSTRUCTION ACCIDENTS 10

Accidents and their causes-Human factors in construction safety-cost of construction injuries-Occupational and Safety hazard assessment-Legal implications

UNIT II SAFETY PROGRAMMES 10

Problem areas in construction safety-Elements of an Effective an safety program-Job site Safety assessment-safety meetings-safety incentives

UNIT III CONTRACTUAL OBLIGATIONS 5

Safety in construction contracts-Substance Abuse-Safety record keeping

UNIT IV DESIGNING FOR SAFETY 15

Safety culture-Safe workers-Safety and first line supervisors-Safety and Middle Managers-Top

Management Practices, Company Activities and Safety-Safety Personnel-Sub contractual obligation Project Coordination and Safety Procedures-Workers Compensation.

UNIT V OWNERS AND DESIGNERS OUTLOOK 5

Owner involvement in construction safety, selecting safe contractors, Designer selection, Owners attitudes about designing for safety, Design decisions that affect safety.

TOTAL = 45

TEXT BOOK:

1. Jimmy W.Hinze, "Construction Safety", Prentice Hall Inc., 1997.

REFERENCES:

1. Richard J. Coble, Jimmie Hinze and Theo C.Haupt, "Construction Safety and Health Management", Prentice Hall Inc., 2001.
2. Tamilnadu Factory Act.

PCM 705 QUALITY CONTROL AND ASSURANCE IN CONSTRUCTION

L	T	P	C
3	0	0	3

GOAL

This subject gives complete awareness of quality control and quality assurance in construction activities.

OBJECTIVES

The course should enable the students to:

1. Create basic knowledge about quality management.
2. Aware of the ISO quality system.
3. Have a wide knowledge of quality planning
4. Familiar with quality assurance and control
5. Have a knowledge of how to improve the quality.

OUTCOME

The students should be able to:

1. Make use of this knowledge for the organization and formulate the system responsibilities and construction teams
2. Implement the standards and preparation of documents in real situation.
3. Use all the relevant codes and standards, codes of quality, quality policy, methods in construction industry, based on the above to attain highest level of customer satisfaction in projects.
4. Wide knowledge in this will help to solve numerous problems on the way and able to take early decisions to achieve the ultimate aim of the organization.
5. With the help of the knowledge students will be able to formulate the details, specification and drawings.

UNIT I QUALITY MANAGEMENT 9

Quality - Introduction, Definitions, Objectives and Management functions, Types of Quality organizational Structure- Responsibilities and authorities, Total Quality System, Inspection, Control and Improvement- Quality circles and Improvement Teams- Construction Team- Owner, engineers, Architect, Contractors.

UNIT II QUALITY SYSTEMS 9

Introduction - Quality system Standard- ISO family of standards and structure Requirement- Preparing quality systems Documents- Quality related training - Implementing Quality system- Third party certification.

UNIT III QUALITY PLANNING 9

Quality Policy, Objectives and methods in construction Industry - Consumers Satisfaction- Ergonomics- Time of completion - Statistical tolerance - Taguch's concept of quality - Codes and Standards- Contract Documents and Construction Programming - Factors influencing construction Quality - Inspection procedures for construction processes and products - Total QA/QC programmme- Cost of Quality.

UNIT IV QUALITY ASSURANCE AND CONTROL 9

Definitions and Objectives - Techniques and needs of QA/QC- Regulatory agent, Contract and Construction oriented objectives and methods- Technical Control and Financial Control - Different aspects of quality - Appraisals- Critical, major failure aspects and failure mode analysis- Stability methods and tools, optimum design reliability testing, reliability coefficient and reliability prediction.

UNIT V QUALITY IMPROVEMENT 9

Selection of Construction materials -Influence of drawings, detailing, specification, Standardization- Bid preparation-Construction activity-Environmental safety, Social and Environmental factors -Natural causel and speed of construction- Life cycle costing- Value Engineering and value analysis.

TOTAL = 45

TEXT BOOKS:

1. James, J.O Brian, "Construction Inspection Handbook - Quality Assurance and Quality Control", Van Nostrand, New York, 1989.
2. Kwaku A., Tenah and Jose M.Guevera, "Fundamental of Construction Management and Organization", Prentice Hall of India, 1995.

REFERENCES:

1. Juran Frank, J.M. and Gryna, F.M. "Quality planning and Analysis ", Tata McGraw Hill, 1982.
2. Hutchins. G., "ISO 9000 ", Viva Books, NewDelhi, 1993.
3. Clarkson H. Oglesby, "Productivity Improvement in Construction ", McGraw Hill, digitized on 2007.
4. John L.Ashford, "The Management of Quality in Construction", E & F.N Spon, New York, 1992.
5. Steven McCabe, "Quality Improvement Techniques in Construction", Addisson Wesley Longman Ltd., England, 1998.

PCM 706 SYSTEM INTEGRATION IN CONSTRUCTION

L	T	P	C
3	0	0	3

GOAL

Understand the Structural and Functional aesthetic system requirements for Buildings. Environmental issues and Service requirement of Plumbing, Electricity, etc in Buildings.

OBJECTIVES

The course should enable the students to:

1. Study the Structural systems in construction.
2. Be familiar with the Environmental system in Construction.
3. Be acquainted with the knowledge of Services in construction.
4. Be familiar with the Maintenance of Construction.
5. Be clear in the Safety of fire, Fire escape system design, Pollution free and Hazard free in Construction execution process.

OUTCOMES

The students will be able to :

1. Apply the knowledge of materials selection and specification.
2. Use relevant Environmental system integration with Structural system.
3. Guide the system of plumbing, Electricity, Arrangements.
4. Develop the Knowledge in the Maintenance and replacement of damage components, maintenance free exposed and finished surfaces.
5. Aware of the safety, Fire, escape system, planning free construction environmental and Hazard free construction execution.

UNIT I STRUCTURAL 9

Structural system, Systems for enclosing buildings, Functional aesthetic system, Materials selection and Specification.

UNIT II ENVIRONMENTAL 9

Qualities of enclosure necessary to maintain a specified level of interior environmental quality-Weather resistance-Thermal infiltration-Acoustic control-Transmission reduction-Air quality-Illumination-Relevant systems integration with structural systems

UNIT III SERVICES 9

Plumbing-Electricity-Vertical circulation and their interaction

UNIT IV MAINTENANCE 9

Component Longevity in terms of operation performance and resistance to deleterious forces-Planning

systems for least maintenance-Feasibility for replacement of damaged components equal life elemental design- Maintenance free exposed and finished surfaces.

UNIT V SAFETY **9**

Ability of systems to protect fire-Preventive systems-Fire escape system design-Planning for pollution free construction environmental-Hazard free Construction execution.

TOTAL = 45

TEXT BOOKS:

1. E.C.Butcher and A.C.Parnell, "Designing for fire safety", John wiley and Sons, 1993.
2. William T.Mayer, "Energy Economics and Build Design", McGraw Hill Book Co., 1983

REFERENCES:

1. Peter R.Smith and Warren G.Jullian, "Building services", Applied Science Publishers Ltd., London.
2. A.J.Elder and Martiz Vinden Barg, "Handbook of Buildings and Enclosure", Mc Graw-Hill Book Co., 1983, digitized on 2007.
3. Jane Taylor and Gordin Cooke, "The Fire Precautions Act in Practices", 1987.

PCM 707 MANAGEMENT INFORMATION SYSTEMS

L	T	P	C
3	0	0	3

GOAL

To understand the importance of Management information systems in managing huge projects in Cconstruction Industry.

OBJECTIVES

The course should enable the students to:

1. Introducing the information system in Architecture.
2. Be familiar with the System development.
3. Develop the Knowledge of Information Systems in Construction Management.
4. Be familiar with the Implementation and control.
5. Develop the Knowledge of system audit.

OUTCOMES

The students will be able to :

1. Develop the framework and evaluation of Information system.
2. Gain the knowledge of System development in Structural methodologies and designing the Structural programs.

3. Apply the knowledge of the information systems in functional areas, Finance, Marketing, and Production.

4. Implement the control in Testing Security, Coding Techniques, Cost benefit analysis, Assessing the value and risk of information system.

5. Utilize the Knowledge to develop Engineering qualities, Software specification, Software quality assurance, Software life cycle models.

UNIT I INTRODUCTION 7

Information systems-Establishing the frame work-Business Models-Information System Architecture-Evolution of Information Systems

UNIT II SYSTEM DEVELOPMENT 8

Modern Information system-System Development Life cycle-Structured Methodologies-Designing computer based Methods, Procedures, Control-Designing structured programs

UNIT III INFORMATION SYSTEMS 10

Integrated construction Management Information System-Project Management Information System-Functional Areas, Finance, Marketing, Production, Personnel-Levels, DSS, EIS, ES-Comparison, Concepts and Knowledge Representation-Managing International Information System

UNIT IV IMPLEMENTATION AND CONTROL 10

Control-Testing security-coding Techniques-Defection of error-Validating-Cost Benefit Analysis-Assessing the value and risk of Information System.

UNIT V SYSTEM AUDIT 10

Software Engineering Qualities-Design-Production,Service,Software Specification, Software metrics, Software Quality assurance-Systems Methodology-Objectives-Time and Logic, Knowledge and Human Dimension-Software life cycle models-Verification and Validation.

TOTAL = 45

TEXT BOOKS:

1. Kenneth C Laudon and Jane Price Laudon, "Management Information Systems - Organization and Technology", Prentice Hall, 1996.

2. Gordon B. Davis, " Management Information System: Conceptual Foundations", Structure and Development, McGraw Hill, 1985, digitized on 2007.

REFERENCES:

1. Joyce J Elam, "Case Series for Management Information Systems", Simon and Schuster, Custom Publishing, 1996.

2. Ralph H Sprague and Huge J Watson, "Decision Support for managers", Prentice Hall, 1996.

3. Michael W Evans and John J Marciniah, "Software Quality assurance and Management", John Wiley and Sons, 1987, digitized on 2007.

4. Card and Glass, "Measuring Software Design Quality", Prentice Hall, 1990, digitized on 2007.

PCM 708 QUANTITATIVE TECHNIQUES IN MANAGEMENT

L	T	P	C
3	0	0	3

GOAL

This subject provides a comprehensive knowledge in operation research and linear programming techniques and also help them to learn the concepts of production management and financial management.

OBJECTIVES

The course should enable the students to:

1. Be acquainted with the knowledge of operations research.
2. Study various production management systems.
3. Understand the concepts of financial management.
4. Study models for decision making.
5. Understand the concepts of managerial economics.

OUTCOME

The students should be able to:

1. Make logical approach to problem and arrive at best solution to problem.
2. Gain knowledge on material management, various network planning techniques and apply this methods to manage the civil engineering projects.
3. Make important financial decisions which would affect the firms profitability.
4. Determine optimal strategies when faced with several decision alternatives.
5. Gain knowledge on interrelations between cost, revenue, volume and profit and can make proper decisions by applying game theory.

UNIT I OPERATIONS RESEARCH 9

Introduction to Operations research-Linear programming-Graphical and Simplex Methods, Duality and Post- Optimality Analysis-Transportation and Assignment Problems

UNIT II PRODUCTION MANAGEMENT 9

Inventory control, EOQ, Quantity Discounts, Safety Stock-Replacement Theory-PERT and CPM-Simulation Models-Quality Control

UNIT III FINANCIAL MANAGEMENT 9

Working Capital Management-Compound Interest and Present Value methods-Discounted Cash Flow Techniques-Capital Budgeting

UNIT IV DECISION THEORY **9**

Decision Theory-Decision Rules-Decision making under conditions of certainty, risk and uncertainty-Decision trees-Utility Theory

UNIT V MANAGERIAL ECONOMICS **9**

Cost concepts-Break-even -Analysis-Pricing techniques-Game Theory applications.

TOTAL = 45

TEXT BOOKS:

1. Vohra, N.D. "Quantitative Techniques in Management", Tata McGraw Hill Co., Ltd, New Delhi, 1990.
2. Seehroeder, R.G., "Operations Management ", McGraw Hill, USA, 1982.

REFERENCES:

1. Levin, R.I, Rubin, D.S., and Stinsonm J., "Quantitative Approaches to Management", McGraw Hill Book Co., 1988.
2. Frank Harrison, E., "The Managerial Decision Making Process ", Houghton Miffin Co. Boston, 1975.
3. Varshney, R.L. and Maheswari, K.L., "Managerial Economics", Sultan Chand, 1975.

PCM 709 BUSINESS ECONOMICS AND FINANCE MANAGEMENT

L	T	P	C
3	0	0	3

GOAL

This subjects give wide scope of understanding the basics of construction economics and financial management in construction projects.

OBJECTIVES

The course should enable the students to:

1. Have a knowledge of economics
2. Familiar with construction economics.
3. Understand the financial management
4. Aware of accounting method.
5. Have a wide knowledge of lending to contractors.

OUTCOME

The students should be able to:

1. Understand the economics in relation to civil engineering, market demand and supply choice of technology

2. Make use of this knowledge in housing, transport and other infrastructure.

3. Apply in practical situations, ie borrowing, generation of funds, budgeting, analysis of financial statement, balance sheet, Investment and financing decision.

4. Analyze the stages of completion of projects during the execution of project and also tax reporting

5. Know about the loans, interim construction financing, security and risk aspects.

UNIT I ECONOMICS 10

Role of Civil Engineering in Industrial Development-Advances in Civil Engineering and engineering economics-Support matters of Economy as related top Engineering-Market demand and supply-Choice of technology- Quality control and Quality Production-Audit in economic law of returns governing production

UNIT II CONSTRUCTION ECONOMICS 10

Development in housing, Transport and other infrastructures-Economics of Ecology, environment, energy resources-Local material selection-Form and Functional designs-Construction workers-Urban problems-Poverty-Migration-Unemployment-pollution.

UNIT III FINANCING 18

The need for financial management-Types of financing-Short term borrowing-Long term borrowing-Leasing -Equity financing-Internal generation of funds-External commercial borrowings-Assistance from Government Budgeting support and International finance corporations-Analysis of financial statements-Balance sheet-Profit and loss account-Cash flow and fund flow analysis-Ratio analysis-Investment and financing decision-Financial control-Job control and Centralized management

UNIT IV ACCOUNTING METHOD 5

General Overview-Cash basis of a accounting-Accrual basis of accounting-Percentage completion method-Completed contract method-Accounting for Tax reporting purposes and Financial reporting purposes

UNIT V LENDING TO CONTRACTORS 2

Loans to Contractors-Interim construction financing-Security and risk aspects.

TOTAL = 45

TEXT BOOKS:

1. Warneer Z Hirsch, "Urban Economics", Macmillan, NewYork, 1993.

2. Prasanna Chandra, "Projects - Planning Analysis Selection Implementation & Review", Fourth Edition, Tata McGraw Hill Publishing Co., Ltd, New Delhi, 1995.

REFERENCES:

1. Kwaku A., Tenah and Jose M. Guevera, "Fundamental of Construction Management and Organization", Prentice Hall of India, 1995.

2. Halpin, D.W., "Financial and cost concepts for construction Management", John Wiley and Sons New York, 1985.

3. Madura J. and Veit, E.T., "Introduction to Financial Management", West Publishing Co., St.Paul, 1988.

PCM 710 CONTRACT LAWS AND REGULATION

L	T	P	C
3	0	0	3

PREREQUISITE Nil

GOAL

To introduce the student to construction laws and regulations in construction industry which includes different Indian and International contracts, tenders, arbitrations and legal requirements.

OBJECTIVES

The course should enable the students to:

1. Be acquainted with the knowledge of construction contracts.
2. Be familiar with the bidding system.
3. Throw light on laws, agreements and arbitrations.
4. Gain knowledge of legal requirement and statutory regulations.
5. Be familiar with the labour regulation.

OUTCOME

The students will be able to:

1. Develop knowledge of Indian contracts and International contracts.
2. Develop knowledge of tenders, prequalification, evaluation based on world bank guidelines.
3. Make use of the laws, arbitration, and enforcement during execution of projects.
4. Aware of various taxes, legal requirement, exercise and customs duties and property laws.
5. Develop knowledge of labour laws, labour administration welfare legistration, Insurance and safety regulations.

UNIT I CONSTRUCTION CONTRACTS 10

Indian Contracts Act-Elements of Contracts-Types of contracts-Features-Suitability-Design of Contract Documents-International contract document-Standard contract Document-Law of Torts.

UNIT II TENDERS 10

Prequalification-Bidding-Accepting-Evaluation of Tender from Technical, Contractual and commercial points of view-contract formation and interpretation-Potential contractual problems-World Bank Procedures and Guidelines.

UNIT III ARBITRATION 5

Comparison of Actions and Laws-Agreements ,subject matter-Violations-Appointment of Arbitrators-Conditions of Arbitrations-Powers and duties of Arbitrator-Rules of Evidence-Enforcement of Award-costs

UNIT IV LEGAL REQUIREMENTS **10**

Insurance and Bonding-Laws Governing Sale, Purchase and use of Urban and Rural land-Land Revenue codes-Tax Laws-Income Tax, Sales Tax, Excise and customs duties and their influence on construction costs-Legal requirements for planning-Property Law-Agency Law-Local Government Laws for Approval-Statutory Regulations.

UNIT V LABOUR REGULATION **10**

Social Security-Welfare Legislation-Laws relating to wages, Bonus and Industrial Disputes, Labour Administration-Insurance and Safety Regulations-Workmen's Compensation Act-Other Labour laws.

TOTAL = 45

TEXT BOOK:

1. Gajaria G.T., "Laws Relating to Building and Engineering Contracts in India", M.M.Tripathi Private Ltd., Bombay, 1982.

REFERENCES:

1. Tamilnadu PWD Code, 1986.
2. Jimmie Hinze, "Construction Contracts", 2nd Edition, McGraw Hill, 2001.
3. Joseph T. Bockrath, "Contracts and the Legal Environment for Engineers and Architects ", 6th Edition, McGraw Hill, 2000.