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UNIVERSITY OF MUMBAI



Revised Syllabus for the Master of Architecture

Programme : M.Arch.

Course :Project Management

(As per Credit Based Semester and Grading System with
effect from the academic year 2012–2013)

Master of Architecture Degree in Project Management

Preamble

It is proposed to offer a regular M.Arch. post graduate course in Project Management of four semesters duration open to students with B.Arch. / G.D. Arch/ B.E. (Civil) recognized qualification. This course is designed to enhance the skills of architects, Engineers and others interested or involved in the ProjectManagement. The course will commence from academic year 2009

Main Themes of this course are as follows:-

- Principles of Management with Advanced Research Techniques
- Contract Regulation & Procedure
- Project Monitoring & Scheduling
- Human resources Management

Objectives of M.Arch (Project Management) course are as follows :-

1. To attain the fundamental understating of large –scale projects.
2. To study vital and sustainable Project Management concepts and programme..
3. To develop successful strategies for the implementation of Project Management Techniques.
4. To judge the performance of projects and process.
5. To work successfully with community, public, private institution and individuals.
6. To develop research skills and enhance knowledge in the field in innovative ways.

Masters Degree in Architecture (Project Management)

First Semester

1.	Principles Of Management
2.	Project Planning & Scheduling
3.	Management Accounting & Financing
4.	Project Monitoring & Control
5.	Project Work

Second Semester

1.	Human Resource Management
2.	Computer Applications
3.	Material & their Management
4.	Advanced Construction Techniques
5.	Project Work

Third Semester

1.	Professional Communication
2.	Project Formulation & Appraisal
3.	Contract Administration & Legal Aspects
4.	Project Finance Management
5.	Project Work

Fourth Semester

1.	Managerial Decision making
2.	Procurement Processes

Teaching and Examination Scheme

For First Semester M.Arch (Project Management) Course

CONDUCTED BY COLLEGE

Sr. No	Subjects	Teaching Scheme			Exam Scheme				Sessional Marks	
		Lecture Periods	Studio	Total Periods	No of Papers	Duration in Hours	Paper Marks	Min Passing Marks	Internal Max Marks	Min Passing Marks
1	Principles of Management	4		4	1	3	100	40	100	50
2	Project Planning	4		4	1	3	100	40	100	50

	& Scheduling									
3	Management Accounting & Financing	4		4	1	3	100	40	100	50
4	Project Monitoring & Control	4		4	1	3	100	40	100	50
5	Project Work	4	4	8	-	-			200	100
	Total	20	4	24	4	-	400		600	

		Lecture Periods	Studio	Total Periods	credits
1	Principles of Management	4		4	4
2	Project Planning & Scheduling	4		4	4
3	Management Accounting & Financing	4		4	4
4	Project Monitoring & Control	4		4	4
5	Project Work	4	4	8	8
	Total	20	4	24	24

First Semester

Sub: - Principles of Management

Teaching hours – 4 hrs per week

Sessional work – 100

Min Marks - 50

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Introduction to Management What is Management? It's Need ,Importance & Purpose, Evolution of Managements thought, Different Schools/ approaches to Management: Behavioral, Quantitative, Systems, Contingency Approach
2.	Construction Management Nature of Construction Industry, Role of Architects and Engineer, Special Charactertics of Construction activity, their Influence on Construction Managements, Development of Construction Management, Scope of Construction Management Project Management, Contracts Managements functions of Construction Managements.
3.	Project Manager Managing projects vis-à-vis Managing Routine activities, Qualities of Project Manager, Selection

	of Project Manager, Training for a Project Manager.
4.	Management Planning What is planning? Importance of Planning, Types of Planning, levels of Planning, Strategies, Policies, Procedure, Rules etc. in the context of Planning.
5.	Organizing Organizing as a Management process, Principles of Organization, Different Structures of organizations such as line, Line & Staff, Functional, Matrix or project Organization: Characteristics, Features, their Merits and Limitation, Ownerships of Organization: Sole Proprietorship, Partnership, Private Ltd., Public Ltd. . Introduction to Organizational climate, Decision Making, Group Decision Making, Staffing: What is Staffing? Steps involved in Staffing, Recruitment, Staffing, Performance Appraisal Development.
6.	Leading Leadership Characteristics, Entrepreneur, Leader And Manger Distinguished, Motivation, Managing Conflicts, Leadership Traits And Styles, Different Approaches To Leadership.
7.	Communication Process Types Of Communication, Communication Model, Feedback, Effective Communication, Listening Skills.
8.	Controlling Controlling as a Management function, Direct and Indirect Control, Elements of Control, Prerequisites for Effective Control.

Sub: - Project Planning & Scheduling

Teaching hours – 4 hrs per week

Sessional work – 100

Min Marks - 50

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Planning Necessity of Planning, Types of Planning: Strategic & Tactical Planning , Long Range, Intermediate range, Short Planning, Planning by Management level, level of details, Pre- tender, Post-tender pre construction and detailed, construction planning, Planning, Prerequisite of planning, data collection, method statement, And work break down structure.
2.	Planning & scheduling Tools Bar charts, mile stone charts, Network Techniques: Brief Historical development, Basic elements of network, Event activity, simple logics of network, AOL& AON network, their construction, probable errors in network, Analysis of network, Critical event, critical activity, critical path and semi critical path, Non critical activity, float, types of floats.
3.	Planning & Scheduling Tools Single & Overlapping relationship: Start to start, Finish to start and finish to finish relationship, Practical applications of network, Time Chainage charts, Line of Balance method, Scheduling with resource constraint, time constraint, Time cost tradeoff – simple & complex.
4.	Preparing project plans, schedules & budgets, master networks

Sub: - Management Accounting & Financing

Teaching hours – 4 hrs per week

Sessional work – 100

Min Marks - 50

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Introduction Introduction to Management Accounting, Concept of Control, Status, Role and Scope of the Management Accounting, Relationship Between Management Accounting and Top-Level Managements.
2.	Accounting Mechanism Accounting Mechanism & Accounting Practices In India. Preparing of Financial Statements, Accounting Policies with Special References to Revenue Recognition Matching Expenses and Revenue & Depreciation Accounting
3.	Financial Statements And Their Analysis Understanding of Financial Statements and Their Analysis, Like Balance Sheet, Profit & Loss Account , Ratio Analysis, Fund Flow Analysis, Statement of Changes In Financial Position.
4.	Statutory Requirement Statutory Requirements for Accounting and Auditing.
5.	Accounting Types Inflation Accounting, Creative Accounting, Social Accounting and Social Audit.
6.	Corporate Reporting Corporate Reporting Practices in India.

Sub: - Project Monitoring & Control

Teaching hours – 4 hrs per week

Sessional work – 100

Min Marks - 50

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Project Monitoring Progress Reporting, Updating Plans, Review Meeting.
2.	Schedule Control Common Causes Of Schedule Delays, Concept of Productivity, Work Study Techniques, Methods Study and Work Measurement, Measurement Productivity in Construction, Methods of Enhancing Productivity.
3.	Cost Control Cost codification, Earned Value Concepts, Variance Analysis, Alarm Reports, Control Measures,

	View Points of the Contractor and Client.
4.	Quality Managements & Control Definition of Quality, Aspects of Quality, Quality Control and Assurance, Inspection and Audit For Quality, Preparation of Manuals and Checklists.
5.	Safety Managements Types of Accidents on Construction Work Sites And Their Common Causes, Direct And Indirect Cost Of Accidents, Occupational Health Hazards, General Precautions to be Followed For Avoiding Accident, Training For Safety.
6.	Integrated Approach to Project Control Project Management Information System, Computer Networking

Sub: - Project Work

Teaching hours – 4 hrs per week

Studio hours:- 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

No theory Examination

Students will finalize theme, related to topics in the semester. Students shall prepare a report on the theme and present it in the seminar.

Suggested Topics:- Guidelines

1. Leadership, Motivation & Control
2. Project Manager: Skills & Training
3. Scope Of Construction Management
4. Planning, Staffing & Organizing
5. Communication
6. Strategic And Tratical Planning
7. Single And Overlapping Relationships
8. Preparation Of Master Networks.
9. Critical Events, Critical Activity, Critical Path
10. Networks Techniques & Analysis
11. Analysis Of Financial Statements
12. Statutory Requirements For Accounting & Auditing

13. Corporate Reporting Practices In India
14. Management Accounting: Scope And Importance
15. Quality Management & Control
16. Productivity
17. Cost Control
18. Safety Management

Teaching and Examination Scheme

For Second Semester M.Arch (Project Management) Course

CONDUCTED BY University of Mumbai

Sr. No	Subjects	Teaching Scheme			Exam Scheme				Sessional Marks	
		Lecture Periods	Studio	Total Periods	No of Papers	Duration in Hours	Paper Marks	Min Passing Marks	Internal Max Marks	Min Passing Marks
1	Human Resource Management	4		4	1	3	100	40	100	50
2	Computer Applications	4		4	1	3	100	40	100	50
3	Material & Their Management	4		4	1	3	100	40	100	50
4	Advanced Construction Techniques	4		4	1	3	100	40	100	50
5	Project Work	4	4	8	-				200	100
	Total	20	4	24	4		400		600	

		Lecture Periods	Studio	Total Periods	credits
1	Human Resource Management	4		4	4
2	Computer Applications	4		4	4
3	Material & Their Management	4		4	4
4	Advanced Construction Techniques	4		4	4
5	Project Work	4	4	8	8
	Total	20	4	24	24

Second Semester

Sub: - Human Resource Management

Teaching hours – 4 hrs per week
Sessional work – 100
Min Marks - 50
Examination scheme
Duration – 3 Hrs
Marks max- 100
Min Marks – 40

	Details of syllabus
1.	Human Resources Management Importance Of Human Resources, Sources Of Personnel Staffing & Recruitments: Job Analysis, Job Specification, Recruitments Tests, Selection & Placement, Training : Need For Training , Training Objectives, Strategies And Methods Training Assessment, Performance Appraisal Compensation, Basic Pay , Variable Pay, Merit Rating, Job Evaluation
2.	Labour Issues Labour: Definition Of Labour And Labour Welfare, Contract Labour & Temporary Labour, Various Theories, Historical Development, Agencies For Labour Welfare.
3.	Industrial Relations Strikes, Lockouts, Lay-Offs, Grievance Functions, Meaning, Grievance Redressal Procedures, Collective Bargaining, Trade Unions.
4.	Overview Of Statutory Measures For Labour Welfare.

Sub: - Computer Applications

Teaching hours – 4 hrs per week
Sessional work – 100
Min Marks - 50
Examination scheme
Duration – NIL
Marks max- NIL
Min Marks – NIL

	Details of syllabus
1.	Office Applications Use of Application Software such as Word Processors, Spreadsheets & Database
2.	Estimating Software's Use of estimating Softwares
3.	Project Management Softwares Use of project Management Softwares

Sub: - Material & their Management

Teaching hours – 4 hrs per week
Sessional work – 100
Min Marks - 50
Examination scheme

Duration – 3 Hrs
 Marks max- 100
 Min Marks – 40

Details of syllabus	
1.	Modern Construction Material Concrete: High Strength And High Performance Concrete, Fiber Reinforced Concrete, Metals: Alloy Steels Aluminum And Its Products Composts: Plastics, Reinforced Polymer, FRP, Cellular Course. Non-Weathering Materials, Flooring And Façade Materials, Construction Chemicals Smart & Intelligent Materials
2.	Materials Management Necessity And Importance, Objective And Functions Of Materials Management, Organization For Materials Management
3.	Materials Procurement Classification & Codification Of Construction Materials. ABC Analysis, Economic Order Quality (EOQ), Purchase Function, Vendor Rating, Vendor Analysis, Legal Aspects Of Purchase, Stores Management.

Sub: - Advanced Construction Techniques

Teaching hours – 4 hrs per week
 Sessional work – 100
 Min Marks - 50
 Examination scheme
 Duration – 3 Hrs
 Marks max- 100
 Min Marks – 40

Details of syllabus	
1.	Subsurface Soil Exploration & Soil Improvement Hazardous Site And Foundation Conditions. Solution Prone Formations, Expansive Soils, Landslide Hazards, Liquefaction Of Soils, Soils Improvement, Mechanical, Thermal, Chemical
2.	Excavation Open Excavation: Trenching Machines, Blasting Methods, Dewatering, Pile Foundations.
3.	Underpinning Procedures Shores, Needles, Grillages, Pit Underpinning, Miscellaneous Methods
4.	Special Topics Of Concrete Construction Formwork: Types, Design Criteria, Patented System Fabrication Of Pre Cast And Pre Stressed Components Pumped And Sprayed Concrete And Mortar, Ready Mixed Concrete, Pre Placed Aggregate Concrete, Polymer Modified Concrete, High Performance Concrete, Roller Compacted Concrete, Concrete, Concrete Masonry, Underwater Concreting Reinforcing Steel: Types, Bending Placing Splicing And Spacing, Tendons
5.	Structural Steel Construction Erection Equipment, Mechanical Fasteners, Welding, Splicing, Clearances For Erection

6.	Environmental Influences On Structures Thermal Effects, Corrosion, Oxidation, Irradiation Of Materials And Structures , Methods Of Prevention
7.	Equipment Managements Mechanization on Construction Projects, Sizing and Matching of Equipment, Selection and Planning for Equipment, Estimating Output of an Equipment, towing, Hiring, Leasing Of Construction Equipment, Equipment , Equipments Maintenance, Cost of Use of Equipment, Life of Equipment, Physical, Economic& Usefulness, Deprecation , Replacement of Equipment

Sub: - Project work

Teaching hours – 4 hrs per week

Studio hours – 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

No theory Examination

Students will finalize theme, related to topics in the semester. Students shall prepare a report on the theme and present it in the seminar.

Suggested Topics – Guidelines

Staffing & Recruitment Methods

Training And Performance Appraisal

Labour Welfare: Types

Theories For Labour Welfare

Industrial Relationship

Statutory Measures For Labour Welfare

Microsoft Office Applications

Estimating Softwares

P.M.I.S.

Concrete And Its Types

Metals As A Modern Construction Material

Necessity & Importance Of Material Management

Objectives And Functions Of Material Management

Vendor Rating & Analysis

Stores Management

Environmental Influences On Structures

Equipment Management

Underpinning Procedures

Soil Improvement

Subsurface Soil Exploration

. Teaching and Examination Scheme

For Third Semester M.Arch (Project Management) Course

CONDUCTED BY COLLEGE

Sr. No	Subjects	Teaching Scheme			Exam Scheme				Sessional Marks	
		Lecture Periods	Studio	Total Periods	No of Papers	Duration in Hours	Paper Marks	Min Passing Marks	Internal Max Marks	Min Passing Marks
1	Professional Communication	4		4	1	3	100	40	200	100
2	Project Formulation & Appraisal	4		4	1	3	100	40	200	100
3	Contract Administration & Legal Aspects	4		4	1	3	100	40	200	100
4	Project Finance Management	4		4	1	3	100	40	200	100
5	Project Work	4	4	8	-				200	100
	Total	20	4	24	4		400		1000	

CREDITS SEMESTER III CREDITS

		Lecture Periods	Studio	Total Periods	CREDITS
1	Professional Communication	4		4	4
2	Project Formulation & Appraisal	4		4	4
3	Contract Administration & Legal Aspects	4		4	4
4	Project Finance Management	4		4	4
5	Project Work	4	4	8	8
	Total	20	4	24	24

Third Semester

Sub: - Professional Communication

Teaching hours – 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Communication Process Communication Process, Methods & Types Barriers To Communication Audience Analysis of Communication
2.	Designing A Report Basic Report Structure, Opening Component, Discussion Component
3.	Writing And Editing The Report Arranging Report Segments and Units, Editing Layout and Visual Aids.
4.	Oral Presentation Oral Presentation With Audio Video Aids

Sub: - Project Formulation & Appraisal

Teaching hours – 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Project Formulation What Is Project? Investment Opportunities Generation And Screening Of Project Ideas, Project Identification, Project Rating , Preliminary Analysis, Market, Technical , Financial, Economic And Ecological –Pre- Feasibility Report, Project Estimates And Techno- Economic Feasibility Report, Detailed Project Report, Different Project Clearances.
2.	Project Estimation Importance Of Estimation, Method Of Cost Estimating, Parameter Cost Estimating, Cost Capacity Factor, Detailed Cost Estimation, Provision Of Escalation, Inflation Provision And Operation Of Contingency Provisions
3.	Project Costing Project Cash Flows, Time Value Of Money, Cost Of Capital
4.	Project Appraisal NPV, BCC,IRR, ARR, Urgency, Pay Back Period, Assessment Of Various Methods Indian Practice

	of Investment Appraisal As Followed By Institutions For Private Projects & For Government Projects, International Practice Of Appraisal Analysis Of Risk, Different Method , Selection Of Project And Risk, Analysis In Practice.
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Sub: - Contract Administration & legal Aspects

Teaching hours – 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus
1.	Introduction Law And The Common Man, Legal Systems In India
2.	Contract Management Bid Cycle, Contract Conditions Interpretation By Parties To Contract, Obligation And Responsibilities Of The Parties, Protection And Indemnification, Bonds And Insurance
3.	Contract Administration Inspection Of Work, Change Of Work, Rejected Work And Deficiencies, Deviations Extra Claims And Their Management, Contract Disputes And Their Settlement , Project Closure
4.	Office Management Proper Record Keeping In Contract Administrating, Establishment Of Standard Procedure, Co Ordination Between Various Agencies Involve, Providing Data For Interpretation Of Contract Clauses.
5.	International Contracting Scope, Nature, Types, Rules & Procedures
6.	Indian Contract Act, 1872 Provisions Of Contract Act, Important Clauses Of The Act
7.	Arbitration & Reconciliation Act 1996
8.	Labour Acts Related To Construction Activity Payment Of Wages Act, Contract Labour Act. Minimum Wages Act, Employees’ State Insurance Act, Workmen’s Compensation Act.

Sub: - Project Finance Management

Teaching hours – 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

	Details of syllabus of the unit
1.	Working Capital Management Policy For Working Capital, Estimating Working Capital Needs, Inventory Management, Accounts Receivable, Credit And Cash Management, Managing Payments To Supplies And

	Outstanding
2.	Working Capital Needs Sources, Procedures, Practices In Construction Business
3.	Capital Investment & Budgeting Capital Investment Decisions, Techniques Of Capital Budgeting, Types Of Budgets, Procedure For Master Budget, Key Factor, Budget Manual, New Approach To Budgeting, Cash Flow Forecasts.
4.	Long Term Financing Working Of Financial Institutes In India And Abroad, Self Financing Stock Exchanges Types Of Securities, Borrowings And Debentures
5.	Relevant Laws Laws Concerning Income Tax, Sales Tax, Professional Tax Turnover Tax, Etc.

Sub: Project Work

Teaching hours – 4 hrs per week

Studio hours:- 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

No theory Examination

Students will finalize theme, related to topics in the semester. Students shall prepare a report on the theme and present it in the seminar.

Suggested Topics :- Guidelines

1. Communication Process
2. Barriers to Communication
3. Reports
4. Oral Presentation
5. Project Estimation
6. Project Costing
7. Legal Systems in India
8. Contract Management
9. International Contracting
10. Office Management
11. Indian Contracts Act, 1872
12. Arbitration & Reconciliation Act, 1996
13. Contract Administration
14. Payments of Wages Act
15. Contract Labour Act
16. Long term Financing
17. Working Capital Management
18. Capital Budgeting
19. Income tax, Sales Tax, Professional Tax
Working Capital in Construction **B**usiness

**Teaching and Examination Scheme
For Fourth Semester M.Arch (Project Management) Course**

CONDUCTED BY University of Mumbai

Sr. No	Subjects	Teaching Scheme			Exam Scheme				Sessional Marks	
		Lecture Periods	Studio	Total Periods	No of Papers	Duration in Hours	Paper Marks	Min Passing Marks	Internal Max Marks	Min Passing Marks
1	Managerial Decision Making	8	4	12	1	3	100	40	200	100
2	Procurement Processes	8	4	12	1	3	100	40	200	100
	Total	16	8	24	2		200		400	

CREDITS SEMESTER IV

		Lecture Periods	Studio	Total Periods	CREDITS
1	Managerial Decision Making	8	4	12	12
2	Procurement Processes	8	4	12	12
	Total	16	8	24	24

Fourth Semester

Sub: - Managerial Decision making

Teaching hours – 8 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

Duration – 3 Hrs

Marks Max – 100

Min Marks – 40

	Details of syllabus
1.	Management Decision Making Management Problems In Construction, System Approach Concept of Optimization
2.	Decision Making Decision Making Under Uncertainty And Risk, Decision Tables and Decision Tree
3.	Linear Programming Formulation of LP Problems, Solution By Graphical Method, Simplex Method, Transportation Problems, Assignment Problems
4.	Network Model Network Definition, Shortest Route Problem, Maximal Flow Problems
5.	Waiting Lines Basic Structure Of Queuing Models , M/Mi Model

6.	Integer Dynamic And Goal Programming Formulation Of Problems And Application
7.	Simulation Random Number Generation, Monte Carlo Method, Applications

Sub: - Procurement Processes

Teaching hours – 4 hrs per week

Sessional work – 200

Min Marks - 100

Examination scheme

Duration – 3 Hrs

Marks max- 100

Min Marks – 40

Details Of Syllabus	
1.	Procurement Process Phases, Types, Selection Of A Particular Type, Local Government Procedure, World Bank Procedure
2.	Tender Documents Components, Purpose & Content, Various Standard Documents
3.	Bid Preparation Estimating, Bid Value, Method Statement, Bid Submission
4.	Bid Evaluation Various Methods, Comparative Analysis Of Bids Award Of Work