Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Civil Engineering

BCE054 Construction Planning Scheduling and Control

Fifth Semester, 2017-18 (Odd Semester)

Course (cataloge) description

The purpose of this course is to learn various applications to Planning and scheduling in Civil Engineering projects. It helps engineers to complete the project in time and within the budget.

Compulsory/Elective course : Compulsory for Civil students

Credit / Contact hours : 3 credits / 45 hours

Course Coordinator : Mr.K.Venkatrraman, Assistant Professor

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Ms.A.Ambica	Final year Civil	Civil Block			9.00 - 9.50 AM
Ms.L.MariaSubashini	Final year Civil	Civil Block			12.45 - 1.15 PM

Relationship to other courses:

Pre –requisites : BCE704 Management Concepts for Civil Engineers

Assumed knowledge : Basic knowledge in Management concepts

Following courses : BCE072 Construction Project Management

Syllabus Contents

UNIT I CONSTRUCTION PLANNING **9**

Basic Concepts in the Development of Construction Plans - Choice of Technology and Construction Method - Defining Work Tasks - Defining Precedence Relationships among Activities - Estimating Activity Durations - Estimating Resource Requirements for Work Activities - Coding Systems

UNIT II SCHEDULING PROCEDURES AND TECHNIQUES 9

Construction Schedules - Critical Path Method – Scheduling Calculations - Float - Presenting Project Schedules - Scheduling for Activity-on-Node and with Leads, Lags, and Windows - Scheduling with Resource Constraints and Precedences - Use of Advanced Scheduling Techniques - Scheduling with Uncertain Durations - Calculations for Monte Carlo Schedule Simulation - Crashing and Time/Cost Tradeoffs - Improving the Scheduling Process.

UNIT III COST CONTROL,MONITORING AND ACCOUNTING 9

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 DURING CONSTRUCTION 9

Quality Concerns in Construction - Organizing for Quality - Work and Material specifications - Total Quality Control - Quality Control by Statistical Methods - Statistical Quality Control with Sampling by Attributes - Statistical Quality Control with Sampling by Variables

UNIT V ORGANIZATION AND USE OF PROJECT INFORMATION 9

Types of Project Information - Accuracy and Use of Information - Computerized Organization and Use of Information - Organizing Information in Databases - Relational Model of Databases - Other Conceptual Models of Databases - Centralized Database Management Systems - Databases and Applications Programs - Information Transfer and Flow.

TEXTBOOKS AND REFERENCES:

1. Chitkara, K.K. Construction Project Management: Planning, Scheduling and Control, Tata McGrawHill PublishingCompany, 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.
3. Chris Hendrickson and Tung Au, Project Management for Construction – Fundamental Concepts for Owners, Engineers, Architects and Builders, Prentice Hall, Pittsburgh, 2000.
4. Willis, E. M., Scheduling Construction Projects, John Wiley & Sons, 1986.
5. Halpin, D. W., Financial and Cost Concepts for Construction Management, John Wiley & Sons, New York, 1985.

Computer usage: Planning, marking Auto Cad

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area: Planning I Estimating I Scheduling I

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 1st week	Session 1 to 14	2 Periods
2	Cycle Test-2	September 2nd week	Session 15 to 28	2 Periods
3	Model Test	October 2nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

This Course is to introduce the applications of planning ,scheduling and controlling various Civil Engineering projects within time and budget.	Correlates to program outcome		
	H	**M**	**L**
1. Know the elements of construction planning and estimating activity durations and resource requirements	a,e,	b,d	
2. Know the elements of scheduling and to apply appropriate tools and techniques like networks and coding systems.	b	e	
3. Understand the monitoring and accounting of projects through cost control.	a,e		
4. Know the elements of quality control and safety of construction projects.	a	d	
5. Know the concept of gathering and using project information		e	

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I CONSTRUCTION PLANNING			
1.	Basic Concepts in the Development of Construction Plans	No	[T1, T2]
2.	Choice of Technology	No	
3.	Construction Methods	No	
4.	Defining Work Tasks	No	
5.	Defining Precedence Relationships among Activities	No	
6.	Estimating Activity Durations	Yes	
7.	Estimating Resource Requirements for Work Activities	Yes	
8.	Coding Systems	Yes	
UNIT II SCHEDULING PROCEDURES AND TECHNIQUES			
9.	Construction Schedules	Yes	[T1, T2]
10.	Critical Path Method	Yes	
11.	Scheduling Calculations - Float	Yes	
12.	Presenting Project Schedules	Yes	
13.	Scheduling for Activity on-Node	Yes	
14.	Scheduling for Activity with Leads, Lags, and Windows	Yes	
15.	Scheduling with Resource Constraints and Precedences	Yes	
16.	Use of Advanced Scheduling Techniques	Yes	
17.	Scheduling with Uncertain Durations	Yes	

18.	Calculations for Monte Carlo Schedule Simulation	Yes	
19.	Crashing Tradeoffs	Yes	
20.	Time/Cost Tradeoffs	Yes	
21.	Improving the Scheduling Process.	Yes	
UNIT III	**COST CONTROL, MONITORING AND ACCOUNTING**		
22.	The Cost Control Problem	Yes	[T3, T4]
23.	The Project Budget	No	
24.	Forecasting for Activity Cost Control	No	
25.	Financial Accounting Systems and Cost Accounts	No	
26.	Control of Project Cash Flows	No	
27.	Schedule Control	No	
28.	Schedule and Budget Updates	No	
29.	Relating Cost and Schedule Information.	No	
UNIT IV	**QUALITY CONTROL DURING CONSTRUCTION**		
30.	Quality Concerns in Construction	No	[T3, T4]
31.	Organizing for Quality	No	
32.	Work and Material specifications	No	
33.	Total Quality Control	No	
34.	Quality Control by Statistical Methods	No	
35.	Statistical Quality Control with Sampling by Attributes	YES	
36.	Statistical Quality Control with Sampling by Variables	YES	
UNIT V	**ORGANIZATION AND USE OF PROJECT INFORMATION**		
37.	Types of Project Information	No	[T4, T5]
38.	Accuracy and Use of Information	No	
39.	Computerized Organization and Use of Information	No	
40.	Organizing Information in Databases	No	
41.	Relational Model of Databases	No	
42.	Other Conceptual Models of Databases	No	
43.	Centralized Database Management Systems	No	
44.	Databases and Applications Programs	No	
45.	Information Transfer and Flow.	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	5%
Assignment	-	5%
Attendance	-	10%
Final exam	-	70%

Prepared by : K.Anitha Assistant Professor,department of Civil **Dated:**

Addendum

ABET Outcomes expected of graduates of B.Tech / Civil / program by the time that they graduate:

a. An ability to apply knowledge of mathematics, science, and engineering
b. An ability to design and conduct experiments, as well as to analyze and interpret data
c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. An ability to function on multidisciplinary teams
e. An ability to identify, formulate, and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. A recognition of the need for, and an ability to engage in life-long learning
j. A knowledge of contemporary issues
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives

PEO1: PREPARATION

Civil Engineering graduates will have knowledge to apply the fundamental principles for a successful profession and/or for higher education in Civil Engineering based on mathematical, scientific and engineering principles, to solve realistic and field problems that arise in engineering and non engineering sectors

PEO2: CORE COMPETENCE

Civil Engineering graduates will adapt to the modern engineering tools and construction methods for planning, design, execution and maintenance of works with sustainable development in their profession.

PEO3: PROFESSIONALISM

Civil Engineering Graduates will exhibit professionalism, ethical attitude, communication and managerial skills, successful team work in various private and government organizations both at the national and international level in their profession and adapt to current trends with lifelong learning.

PEO4: SKILL

Civil Engineering graduates will be trained for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS

Civil Engineering graduates will be installed with ethical feeling, encouraged to make decisions that are safe and environmentally-responsible and also innovative for societal improvement.

Course Teacher	Signature
Ms.A.Ambica	
Ms.L.MariaSubashini	

Course Coordinator **HOD/CIVIL**