A) COURSE

Course Id:	Course
5977	ENGINEERING METHODS

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
3	2	3	8	48

B) GENERAL COURSE INFORMATION:

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:	NA	NA	VIII	NA	NA
Course Type (Required/Elective)	NA	NA	REQUIRED	NA	NA
Prerequisite Course:	NA	NA	OPERATIONS RESEARCH	NA	NA
CACEI Classification:	NA	NA	CI	NA	NA

C) COURSE OBJECTIVE

At the end of the course, the student will be capable of:
GIVE STUDENTS A VISION OF HOW APPLIED A PRODUCTION PROCESS IN GENERAL, BY DIRECT HUMAN INTERVENTION EITHER AS A DIRECT OR INDIRECT, THE LATTER IN THE CASE OF A TYPICAL AUTOMATED SYSTEM. TO EMPHASIZE THE ANALYTICAL AND CRITICAL STUDY OF THE IMPACT OF EACH PARTICULAR OPERATION OVER THE ENTIRE PRODUCTION PROCESS. EVALUATE EACH SITUATION, SO THAT IT CAN GIVE CONTROL AND MONITORING AS WELL AS THE NEEDS, CAN BE APPLIED PROACTIVELY BY AN ACTION OF IMPROVEMENT OBSERVED DATA AND A SIMULATION OF THE BEHAVIOR.

D) TOPICS (CONTENTS AND METHODOLOGY)

1 .- UNIT 1 (INTRODUCTION)		5 Hours
Specific Objective:	Introduction.	
1.1. HISTORICAL DATA. 1.2. IMPORTANCE OF PRODUCTIVITY. 1.3. SCOPE OF THE METHODS AND STANDARDS. 1.4. TECHNIQUES FOR TROUBLESHOOTING. 1.4.1 EXPLORATION TECHNIQUES. 1.4.2 RECORDING AND ANALYSIS TECHNIQUES.		
Readings and other resources	Books, Articles, Further literature, Internet Links.	
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.	
Learning Activities		

2.- ANALYSIS OF THE OPERATION		9 Hours
Specific Objective:		
2.1 NINE MAIN APPROACHES OF THE OPERATION ANALYSIS. 2.2 PRINCIPLES OF DESIGN LABOR ECONOMICS MOVEMENTS 2.3 STUDYING MOVEMENTS. 2.4 MANUAL LABOR.		
Readings and other resources	Books, Articles, Further literature, Internet Links.	
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.	
Learning Activities		

3. - WORKPLACE DESIGN, EQUIPMENT AND TOOLS		2 Hours
Specific Objective:		
3.1 PRINCIPLES OF WORKPLACE DESIGN. 3.2 PRINCIPLE DESIGN OF MACHINES AND EQUIPMENT. 3.3 PRINCIPLES OF DESIGN TOOLS. 3.4 DESIGN OF THE WORKING ENVIRONMENT. 3.5 SHIFT WORK AND SCHEDULES. 3.6 SAFETY AT WORK. 3.7 ERGONOMIC ANALYSIS		
Readings and other resources	Books, Articles, Further literature, Internet Links.	
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.	
Learning Activities		

4.- TIME STUDY		8 Hours
Specific Objective:		
4.1 A FAIR DAY'S WORK. 4.2 REQUIREMENTS OF THE TIME STUDY. 4.3 CALCULATION OF THE STUDY. SUBTOPICS 4.2.1 TEAM 4.2.2 STUDY ELEMENTS 4.2.3 STUDY IT. 4.2.4 PERFORMANCE OF THE OPERATOR. 4.2.5 STANDARD TIMES		
Readings and other resources	Books, Articles, Further literature, Internet Links.	
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.	
Learning Activities		

5. - **PERFORMANCE RATING**		10 Hours
Specific Objective:		
Readings and other resources	Books, Articles, Further literature, Internet Links.	
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.	
Learning Activities		

E) TEACHING AND LEARNING METHODOLOGIES

THE TEACHING OF THE SUBJECT WILL BE OUT OF THE WAY:

1) INTRODUCTION AND ANALYSIS OF CONCEPTS BY THE TEACHER AND SUPPORTED ACETATES ACCORDING TO THEMATIC CONTENT, NUMBER OF HOURS AND THE BOOK FOR THE TOPIC. IT WILL ALSO DISCUSS ISSUES WITHIN THE CLASSROOM AND READING TO DO TO WORK WITH THEM IN THE SECOND SESSION AFTER THE DATE OF REQUEST. THE WORK IN THE CLASSROOM BY THE STUDENTS WILL BE IN GROUPS. THESE GROUPS RETAIN THE SAME PARTICIPANTS THROUGHOUT THE COURSE, SO AS TO ACHIEVE GREATER INTEGRATION AND TEAMWORK

2) FOR THE STUDENT, IT REQUIRES AN INVESTIGATION OF AN ACTUAL CASE, WHICH WILL BE DEVELOPED AFTER THE FIRST EVALUATION AND SHALL BE ON THE LAST WEEK OF CLASS, WHICH WILL BE EXHIBITED IN A GROUP. THIS EXHIBITION WILL BE A COLLECTION AND ENFORCEMENT OF ALL THE OBSERVED IN THE COURSE.

F) EVALUATION CRITERIA:

Evaluation:	Schedule	Suggested Form of Evaluation and weighing	Topics
1er. Evaluation Partial	Session 16	Exam 85% , Homework 10%, Assistance 5%	Unity 1 y 2
2º Evaluation Partial	Session 32	Exam 85% , Homework 10%, Assistance 5%	Unity 2 y 3
3er. Evaluation Partial	Session 48	Exam 85% , Homework 10%, Assistance 5%	Unity 3 y 4
Evaluation Final Ordinary		100% Average partial evaluations	
Other Activity:			
Exam Extraordinary	Week 17 of the semester in progress	100% Exam	100% Program
Exam of title	According to schedule school secretary	100% Exam	100% Program
Exam regularization	According to schedule school secretary	100% Exam	100% Program

G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES

NIEBEL BENJAMIN, INGENIERÍA INDUSTRIAL, ESTUDIO
DE TIEMPOS Y MOVIMIENTOS. ALFAOMEGA, 2004
BIBLIOGRAPH COMPLEMENTARY.

NORIEGA EDITORES, INTRODUCCIÓN AL ESTUDIO DEL TRABAJO. 4A ED OIT. LIMUSA.

HODSON WILLIAM K., MAYNARD'S INDUSTRIAL ENGINEERING HANDBOOK 4TH ED. MCGRAW-HILL.
KRICK EDWARD, INGENIERÍA DE MÉTODOS. TRILLAS, 2005
COMPUTATIONAL TOOLS:

PROMODEL
QUEST
WINDOWS ENVIRONMENT

Main Books

Complementary Books

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