WP2: Development of training courses

Training course

QUALITY MANAGEMENT TOOLS

Final report

FOODQA partner: Creative Thinking Development (CRE.THI.DEV.)

Local Scientific coordinators: Lina Tsakalou and Sofia Papakonstantinou (CRE.THI.DEV.)

FOODQA - FOSTERING ACADEMIA-INDUSTRY COLLABORATION IN FOOD SAFETY AND QUALITY 574010-EPP-1-2016-1-JO-EPPKA2-CBHE-JP



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1 Syllabus and Contents

TITLE: Quality Management Tools

Teaching/contact time: 16 hours

A: Target group

- Practitioners of the food chain sector
- Experienced professionals
- Undergraduates
- Master degree students, PhD

B: Learning outcomes

The aim was for trainees to be able to:

- Understand the basic principles of quality and quality management
- Understand the principles of Statistical Process Control
- Understand and use in processes the basic quality tools

C: Minimum knowledge pre-requisites

Minimum requirements (knowledge): Basic knowledge of statistics

D: Contents

	Sub-topic	Teaching material	Reference person
1.	 Basic Quality Concepts Basic Quality Definitions History of Quality Control And Improvement 	Powerpoint presentation , e-book	Ms Lina Tsakalou
2.	 Statistical Quality Control Statistics Used In Quality Statistical Process Control Acceptance Sampling Design Of Experiments (DOE) 	Powerpoint presentation, examples, e-book	Prof. Sotirios Bersimis
3.	Quality ToolsCheck SheetsRun Charts	Powerpoint presentation, examples, e-book	Prof. Sotirios Bersimis

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Sub-topic	1	Teaching material	Reference person
Control Charts	(Fishbone) Diagrams y (Capability Indices)		

<u>E: Complementary activities</u>

- A tour to the Agricultural University of Athens premises, including laboratories, workstations, simulation farms, etc.
- A visit at the YIOTIS food company in collaboration with the "Quality Management Systems (ISO 9001:2015)" Training Module that was presented on April 16 & April 17 by AUA. Presentation of the company's processes, laboratories etc.

F: Evaluation: self-evaluation

4 questions per subtopic were to be answered by the participants.

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2 Planning and Organisation

Organisational information

Training courses: Quality management tools

Training Venue: Agricultural University of Athens (lera Odos 75, 11855 Athens, Greece) - Central Administration Building – 1st floor

Responsible partner: CRE.THI.DEV.

Schedule at glance

15 April: Arrival in Athens for the first module "Quality Management Systems (ISO 9001:2015)" that took place on April 16 & April 17, for which AUA was the responsible partner.

18 April: Visits to AUA premises and to YIOTIS Food Company.

19 April – **21** April: Training of the course "Quality Management Tools" (classes, assessment, training evaluation, tour to AUA premises including laboratories, workstations, simulation farms, etc.).

Location of the training venue

The participants received analytical information regarding their stay in Athens, tickets and transportation, access to the training venue, etc.



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ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ AGRICULTURAL UNIVERSITY OF ATHENS



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3 Training Course Timings

3.1 Schedule

Wednesday, 18 th April 2018						
09:00 - 11:00	Tour to AUA premises					
11:00 - 15:00	Visit to YIOTIS Company					
 YIOTIS S.A. is a historic Greek food company located in Athens, with products that include baby foods, powder mixes for baking and cooking, chocolates, syrups and chilled desserts. The company was founded in 1930 and offered children food with ingredients from local crops such as corn and rice. From that day on, the company has never stopped innovating. The Company has one of the finest Research and Development Departments in the Greek Food Industry. The company meets the needs of the whole family, with a rich variety of innovative products that make them the homemaker's "right hand" when it comes to cooking and baking at home. In addition to this, it has been steadily playing its part in strengthening the Greek economy by consistently implementing its investment plans. In 2014, the company invested in acquiring a new warehouse in Mandra, Attica, with a total area of 9,000 sq. m. and capacity for 5,500 pallet stacks. In 2015, YIOTIS S.A. continued its steady investment plan in Greece and completed the construction of new company facilities was completed. These 1350 sq. m. facilities house the "Hellenic Research and Innovation Center" (HRIC), which gives the company the ability and the momentum to increase the checks and controls, it carries out on its Food Production. At the same time, the company is dynamically strengthening its presence in foreign markets in all five continents. YIOTIS S.A. 130, Kifissou Av. GR-121 31, ATHENS GREECE http://www.jotis.gr 						
Thursday, 19 th						
10:00 - 10:30	Welcome					
10:30-11:15	Basic Quality Concepts	Lina Tsakalou (CRETHIDEV)				
	Basic Quality Definitions					
11.15 11.20	History Of Quality Control And Improvement					
11:15 - 11:30	Break	Drof Cativian Darsimin				
11:30 - 12:30	 Introduction to Statistical Quality Control Statistics Used In Quality 	Prof. Sotirios Bersimis				
	 Statistical Definition of Quality Design of Experiments 					
	 Design of Experiments Statistical Process Control 					
	Statistical Process Control Acceptance Sampling					
12:30 - 12:45	Break					
12:45 - 13:30	The Main Quality Tools	Prof. Sotirios Bersimis				
	Check Sheets					
	Flowcharts					
	Cause And Effect (Fishbone)					
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	Histograms	
	 Scatter Diagrams 	
	Pareto Charts	
	Run Charts / Control Charts	
13:30 - 13:45	Break	
13:45 - 14:30	The Main Quality Tools (continued)	Prof. Sotirios Bersimis
14:30 - 14:45	Break	
14:45 – 15:30	Introduction to Process Capability	Prof. Sotirios Bersimis
	 Process Distribution & Specifications 	
	Quality Costs	
	 Process Capability Indices (Cp) 	
	 Process Capability Indices (Cpk) 	
	Summary of the day - Discussion	
Friday, 20 th Apr	il 2018	
10:00 - 12:00	Tour to AUA premises	
12:15-13:00	Introduction to Statistical Process Control	Prof. Sotirios Bersimis
	Basic Characteristics of Control Charts	
	 Phases of Statistical Process Control 	
	Control Charts for Variables	
	Average Run Length	
	Control Charts for Attributes	
13:00 - 13:15	Break	
13:15-14:00	Introduction to Statistical Process Control (continued)	Prof. Sotirios Bersimis
14:00 - 14:15	Break	
14:15-15:00	Introduction to Statistical Process Control (continued)	Prof. Sotirios Bersimis
	Summary of the day - Discussion	
15:00-15:30	Evaluation	
Saturday, 21 st A	pril 2018	
10:00 - 12:00	Case studies	Lina Tsakalou (CRETHIDEV)
12:00 - 12:15	Break	
12:15-14:00	Summary of the day - Discussion	Lina Tsakalou (CRETHIDEV)

3.2 Teachers

- Ms Lina Tsakalou

Lina Tsakalou is a Chemical Engineer BSc is a Project Manager for CRE.THI.DEV where she has served as the Project Quality Manager for several Erasmus+ projects. She has worked at ELKEDE Technology & Design Centre SA at its Quality Department and the Quality Control Laboratory, in charge of the Product Certification Office. During the same time she also prepared the Certification Quality System for Accreditation assessment according to the EN45011 standard and has served for many years as an Assistant Quality Manager for the Quality Control Laboratory of ELKEDE. During her work at the Laboratory, she was in charge of the coordination of the internal laboratory quality control in the scope of the accreditation of the Laboratory according to EN ISO 17025. She has also been the main trainer on the subject "Introduction to the Requirements of ISO 9001", for entrepreneurs from Moldavia, Georgia, Ukraine, Serbia, Albania, and Egypt, in cooperation with the Training Centre of the National Bank of Greece & EOMMEX.

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- Prof. Sotirios Bersimis

Bersimis Sotirios is an Assistant Professor at the Statistics and Insurance Science Department of the University of Piraeus, where he has been providing his academic services since 2010. He is a PhD holder in Statistics and Probability, from the Statistics and Insurance Science Department of the University of Piraeus. He also holds an MSc in Statistics from Athens University of Economics and Business and a BSc in Statistics and Insurance Science from the University of Piraeus. His doctoral research has been funded by a scholarship from the Hellenic General Secretary of Research and Technology. He has also been granted a post-doctoral fellow scholarship by the Hellenic State Scholarships Foundation. His teaching at the University of Piraeus involves "Statistics" in the Department of Economics, in the Department of Industrial Management and Technology, "Biostatistics" and "Statistical Quality Control" in the Department of Statistics and Insurance Science as well as "Biostatistics and Epidemiology" and "Clinical trials" both in a post-graduate level in the Statistics and Insurance Science Department of Business Administration. Since December 15th 2015, he has been appointed as President of the Hellenic Organization for Health Care Services Provision (EOPYY), which is a governmental agency responsible for providing health care services to all Greek citizens.

http://www.unipi.gr/unipi/en/sbersim.html

https://www.linkedin.com/in/sotiris-bersimis-7564465/

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4 List of Participants

The training seminar eventually was attended by 6 trainees (out of 19 registered). In the following table the persons that did not attend are noted.

UNIVERSITY	No.	TITLE	FULL NAME	
	1	Mr.	JASER KHALAF QASEM MAHASNEH	Did not attend
Jordan University of Science		Mr.	BASHAR HAMMAD ALI AL-DWAIRI	Did not attend
and Technology (JUST)	3	Mr.	RA'ED KHALED BDAIWI AL-ZOUBI	Did not attend
-		Dr.	KHALID IZEDDIN BARAKAT ALKHATIB	Did not attend
Jerash University (JU)	5	Dr.	EBRAHEEM SULIMAN YOUSUF AL TAHA'T	Did not attend
Jerasii Oliiveisity (JO)	6	Dr.	AHMED MOHAMMD MAHMOUD AL-HAWAMDEH	Did not attend
	7	Eng.	SAFA'A REDWAN ASAD AL-SMADI	Attended
The Jordan Food and	8	Eng.	NAWAL AHMAD ABDELQADER ALSAKARNEH	Attended
Drug Administration (JFDA)	9	Eng.	OMAR M. A. ADWAN	Attended
	10	Eng.	RA'AFAT KHALAF ALI ALHALAKI	Attended
	11	Prof.	MOHAMMAD ALI MOHAMMAD ALOMARI	Did not attend
University of Jordan (UJ)	12	Prof.	(MOHAMMED ISAM) AHMAD MOHAMMED YAMANI	Did not attend
	13	Prof.	MAHER MAHMMUD BASHEER DABBAS	Did not attend
	14	Mr.	RA`ED ABDULELAH OTHMAN ALSAIED AHMAD	Did not attend
	15	Eng.	BASIM ABDEL RAHMAN AHMAD ALDABABSEH	Did not attend
Al-Balga` Applied	16	Eng.	ASEEL KHALED MOHAMMAD ALRAHAHLEH	Did not attend
University (BAU)	17	Eng.	MOHAMMED NOURI ABDALLAH ABU HAZEEM	Attended
	18	Eng.	LAMA MOHAMMAD AHMAD ABU HAMOUR	Did not attend
	19	Dr.	MAHDI AHMAD MUSA NISIRAT	Attended

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Signatures 5

There were some trainees who signed for more days of the training by accident. The signatures for the days that these trainees did not attend have been erased with a red X.

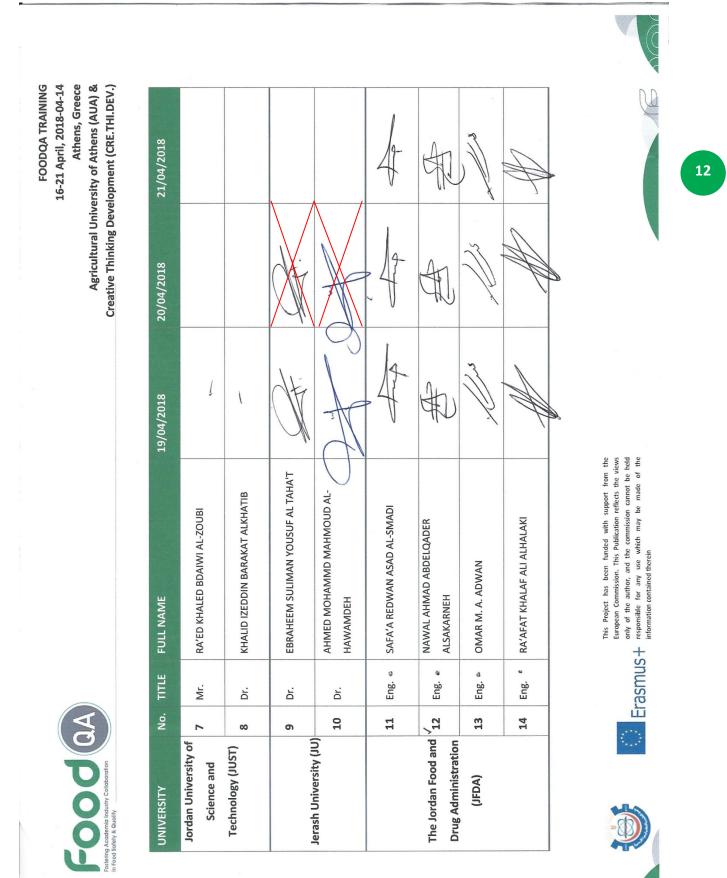






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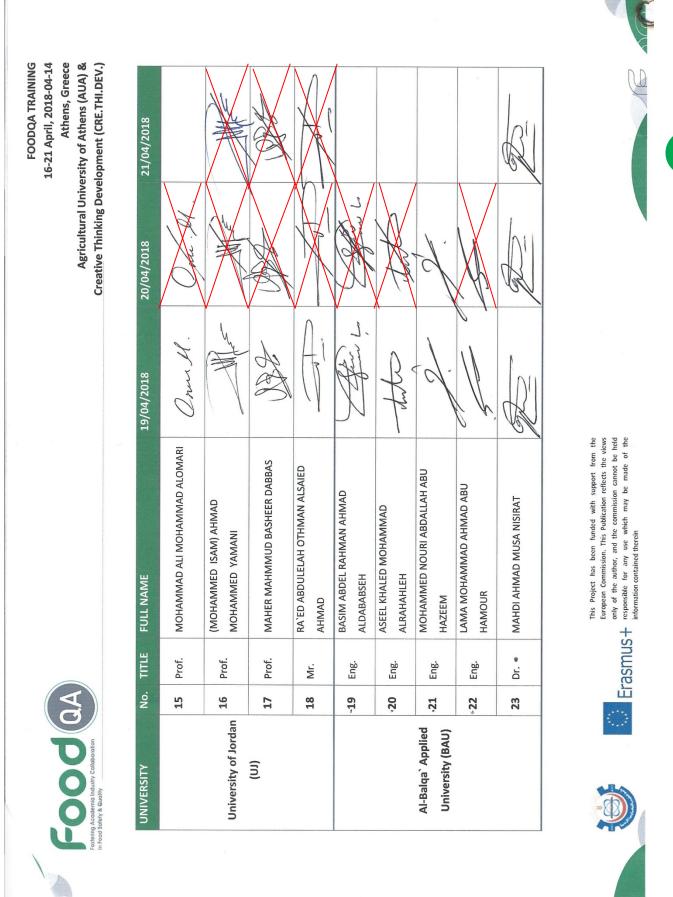








Final Report: Training course "Quality Management Tools"









6 List of Additional Training Materials

DAY 1	INTRODUCTION TO QUALITY CONTROL (HISTORY &	LINA TSAKALOU
	DEFINITIONS)	
	STATISTICAL QUALITY CONTROL PART 1:	PROF. SOTIRIOS BERSIMIS
	QUALITY	
	QUALITY DIMENSIONS AND CHARACTERISTICS	
	PRODUCTION PHASES &	
	TECHNICS OF STATISTICAL QUALITY CONTROL	
	BASIC STATISTICS	
	THE MAGNIFICENT SEVEN	
	UNDERSTANDING VARIABILITY	
	PROCESS CAPABILITY	
DAY 2	STATISTICAL QUALITY CONTROL PART 2:	PROF. SOTIRIOS BERSIMIS
	STATISTICAL BASIS OF THE CONTROL CHART	
	CONTROL CHART FOR VARIABLES	
	CONTROL CHARTS FOR INDIVIDUAL OBSERVATIONS	
	CONTROL CHARTS FOR ATTRIBUTES	
DAY 3	EXAMPLES	PROF. SOTIRIOS BERSIMIS

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7 Assessment

The final assessment of the acquired knowledge was carried out using a questionnaire made of 10 questions.

7.1 Training Assessment Questionnaire



Training assessment

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Work Package: 2- Development of training courses Seminar/Training Course Title: *Quality Management Tools* Location of training: *Athens* Date: 20 April 2018 Your name (compulsory): Your company/organisation (compulsory): Email (compulsory):

1 Choose the best answer

- 1. Does the product/service meet the purpose of which it is destined?
- (a) Performance
- (b) Reliability
- (c) Durability
- (d) Serviceability

2. Flowchart

- (a) is a form (document) used to collect data
- (b) is a graphical representation of a process
- (c) looks like a "Fish Skeleton"
- (d) is used to improve Serviceability

3. Process capability index Cp should take values

- (a) greater than 1
- (b) greater than 1.66
- (c) smaller than 1
- (d) greater than 0

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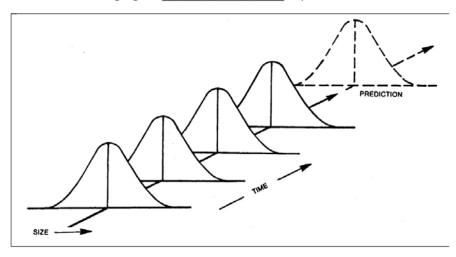






Training assessment

- 4. Pareto chart is similar to
- (a) bar chart
- (b) box plot
- (c) pie chart
- (d) scatter plot
- 5. Using Scatter Plots you can
- (a) identify out-of-control variables
- (b) identify possible correlations
- (c) depict the process flow
- (d) plot one variable
- 6. In the following figure ______ is presented.



- (a) an out-of-control process
- (b) an in-control process
- (c) a scatter plot
- (d) a flow chart

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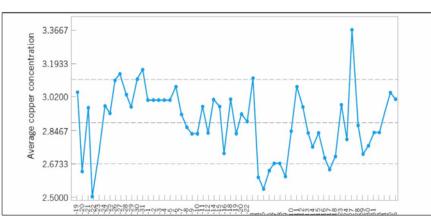
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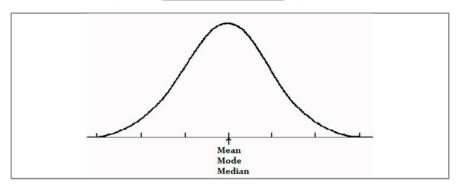
Training assessment

7. In the following figure ______ is presented.



- (a) a control chart
- (b) a scatter plot
- (c) a run chart
- (d) a pre-control chart

8. In the following figure ______ is presented.



- (a) a symmetrical distribution
- (b) a skewed distribution
- (c) a bivariate distribution
- (d) a multivariate distribution

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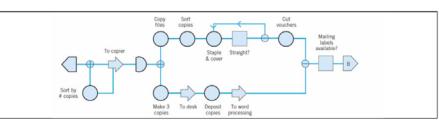






Training assessment

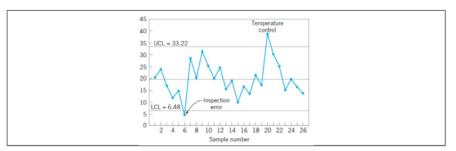
9. In the following figure ______ is presented.



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- (a) a flowchart
- (b) a fishbone chart
- (c) a scatter plot
- (d) a time series plot

10. In the following figure ______ is presented.



- (a) a c-chart
- (b) a p-chart
- (c) a S-chart
- (d) a time series plot

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7.2 Assessment Results

All trainees have taken the exam, with average correct responses to questions 66,7%. All participants had correct responses above 60%.

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8 Pictures

1. At the Fish, Microbiology and Dairy Laboratories, AUA





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2. At the tour and presentations in YOTIS facilities:





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3. Training Sessions with Ms Lina Tsakalou & Prof. Sotirios Bersimis





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9 Training Evaluation

Work Package: 2-Development of training courses

Seminar/Training Course Title: Quality Management Tools

Location of training: Athens, Greece

Date: 18-22 April

	e answer each question with a grade between 1-5, where 1 is Fully disagree	weighted average
(1) P	lease rate the overall training experience.	
a)	The training was well planned and organised.	87,0%
b)	The training facilities were adequate and comfortable.	90,0%
c)	The technical resources used were satisfactory.	83,0%
d)	Materials provided were helpful.	90,0%
e)	The objectives of the training were clearly defined and met.	83,0%
f)	The training content was well organised.	77,0%
g)	The topics of the training were clear and easy to follow.	87,0%
h)	Length of training was sufficient.	70,0%
i)	The training enhanced my understanding on the subject.	80,0%
j)	Training was relevant to my needs.	83,0%
k)	The training will be useful to my work and my professional growth.	90,0%
I)	Training met my expectations.	80,0%
(2) V	Vhat is your opinion of the Trainers, regarding:	
a)	The trainer was knowledgeable about the training topic.	83,0%
b)	The trainer had the ability to explain and illustrate concepts.	87,0%
c)	The topics were presented in a clear and understandable manner.	87,0%

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Please answer each question with a grade between 1-5, where 1 is Fully disagree and 5 is Fully agree.	weighted average
d) The trainer encouraged participation, interaction and answered questions clearly.	90,0%
e) The trainer's communication style kept me focused and interested.	83,0%

(3)	Was this training appropriate for your level of experience?	Yes	No
		100%	0%
(4)	Which topics were not covered or insufficiently covered, in your	opinion?	
	ISO was not covered well.		
•	All topics of the course were covered.		
•	Still it's a standard and should be given before.		
•	All.		
(5)	Which topics were not relevant in your opinion?		
•	No topics were not relevant.		
•	The statistical part.		
•	Quality Tools, but it was good and the trainer is also good.		
•	None.		
(6)	What did you like best about the training?		
•	Dr. Bersimis Sotiris is an excellent trainer.		
•	I think you may add signature of trainee at each entry and exit, so	you can monitor	attendance perfectly.
•	The Quality Management Tools.		
•	All things were good.		
•	Dr Bersimis of how he was relating the subject together.		
•	Dr Bersimis is an excellent trainer.		
•	Dr Bersimis' method of interconnecting the material.		
(7)	What suggestions or comments do you have for making the prog	ram more effecti	ive?
(*)			
•	Monitoring attendance and the materials could be given for th	e trainees befor	e the training, so the
	trainees could be prepared for the course. Special thanks for		-

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teaching this course.





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9.1 Overall Conclusions

- The overall results of the evaluation of the training are positive as the majority of the trainees agree that the objectives of the training were clearly defined and met, the training enhanced understanding on the subject and that the training was relevant to their needs.
- 50% of the respondents believe that the length of training was sufficient, while 33% had a neutral response to this question.
- All agree that the training was well planned and organized, the facilities were adequate and comfortable, and the materials provided were helpful and that the training will be useful to their work as well as to their professional growth.
- The majority agree that the technical resources used were satisfactory, the training content was well organized and that the topics of the training were clear and easy to follow.
- The majority agree that the training workshop met their expectations.
- The majority of the participants consider that the trainers were knowledgeable about the training topic and that they had the ability to explain and illustrate concepts.
- The majority believe that the topics were presented in a clear and understandable manner and that the trainers encouraged participation, interaction and answered questions clearly.
- The majority stressed that the trainers' communication style kept them focused and interested.
- All consider that the level of training was appropriate for their level of experience.
- All stressed that the trainers of the subject *Quality Management Tools*, were very qualified.

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10 Annexes

Annex 1: Introduction to Quality Control (History & Definitions)

Annex 2: Statistical Quality Control Part 1

Annex 3: Statistical Quality Control Part 2

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