Basic Sciences

Division

Department of Chemistry

Follow up Modular Workshop III

CUCEI

UNIVERSIDAD DE GUADALAJARA
CENTRO UNIVERSITARIO DE CIENCIAS EXACTAS E INGENIERÍAS

1.- GENERAL INFORMATION				
Learning unit: Follow up Modular Workshop III		**Department:** Chemistry		**Course format** Lecture
Prerequisites(P) Modular Follow up Workshop II	**Corequisites (CO)** None	**Ascribed academy** Chemistry	**Module:** M3 Analysis and characterization.	
Type Modular project	**Lecture hours** 2 h per week	**Practice hours** 0 h	**Total hours** 34h	**Credits** 2
Degrees in which this class is taught: B.S in Chemistry.				

2.- GENERIC COMPETENCIES

Students…
- Interpret and explain the phenomena of their reality from scientific methodology.
- Search and classify the different types of research in the scientific and technological field inside and outside school.
- Presents a research draft related to the area of chemistry.
- Develop protocol elements on a structured document.
- Present the research protocol orally and in writing.

Specific competencies:

-Synthesis, abstraction and analysis.
-Computer and communication skills
-Problem identification
-research abilities
-Application of knowledge to practical knowledge
-Oral and written production
-Team work
-Critical approach to self and others
-Ethical commitment.

3.- SPECIFIC CHARACTERISTICS OF THE COMPETENCIES

Knowledge	Students: ▪ Understand the importance of criteria and elements that make up successful research. ▪ Have a critical view on the choosing of a research method. ▪ Have a general scope of the different research methods.

	▪ Are able to design a research proposal with enough background support in order to be approved.
Skills	• Apply research strategies to propose solutions to problems. • Identify, contextualize and propose real solutions and well supported to problems detected in the professional field. • Present the research projects they carry out both in writing and orally. • Find and retrieve the required literature in order to do their research project. • Systematize the scientific bibliographic information related to their research project.
Aptitudes	• …identify and solve problems through the formulation of hypotheses and the application of the necessary principles in an analytical and synthetic way. • … relate different knowledge of different fields and apply it in professional and ordinary situations. • …develop study habits and manage their own learning. • …find solutions to specific theoretical or practical problems where they apply the knowledge they learned.
Values	El alumno desarrolla y reafirma valores tales como: La responsabilidad, honestidad, tolerancia, respeto, solidaridad, buena disposición, actitud positiva para el trabajo individual y en equipo.

4.- TRANSVERSAL COMPETENCIES

☑	Foreign Language (English)
☑	Critical, analytical and synthetic thinking. a
☑	Oral and written expression
☑	Professional ethics
☐	Administration of human and material resources
☑	Leadership and sustainability
☑	Creativity, innovation and entrepreneurship
☐	Other

5.- COURSE CONTENT OF THE LEARNING UNIT

1. Importance of characterization techniques in research.
2. Data analysis and result discussion
3. Process of the scientific investigation.

6.- ASSESSMENT

☑	Numeric grade

7.- GRADING CRITERIA OF THE LEARNING UNIT	
Indicator of evaluation	**Percentage**
Departmental exams	0
Partial exam	15
Homework	40
Research activities	25
Practice reports	15
Class participation	5
Other	0

8.- REQUIRED MATERIAL (for students)	
☐	
☑	Logbook Articles and research report

9.-SPECIFIC CONTENT BY LEARNING UNITS						
Content unit	**Generic competency of the content unit**	**Topics**	**Class hours**	**Professor activities**	**Student activities**	**Bibliography**
Unit 1 Importance of characterization techniques in research.	Students search and classify the different types of research in the scientific and technologic field.	1.1 Spectroscopic techniques	2	Professor… … guides the students into the subject by brainstorming the characterization technique and their importance in scientific research. Guides students to apply the acquired knowledge a tool to solve problems in different areas	Students… -Play an essential role by finding information and discussing the different concepts stated by the professor. -Respond exercises and do homework of the content unit.	A number of articles of scientific investigation that cover the topics of this learning unit.
		1.2 Electrochemical techniques	2			
		1.3 Coupled techniques	2			
		1.4 Integration of techniques to test the hypotheses.	2			
Unit 2		2.1 Hypotheses and	2	Professor… … guides the students into the	Students… Do homework of the unit concepts.	*Metodología de la Investigación. El proceso y*

Data analysis and result discussion	Students develop data analysis skills through statistical techniques and experimental methods.	hypotheses tests.		subject by brainstorming the concepts of science and knowledge diffusion. Visits the labs where the research is taking place. . Designs and assigns homework that promote feedback of the topics seen in class.	Play an essential role by finding information and discussing the different concepts stated by the professor Present their research proposal and discuss about it.	*sus etapas*. Mexico: Limusa Web sites retrieved from: http://www.conacyt.gob.mx/index.php/el-conacyt/sistema-nacional-de-investigadores http://www.scimagojr.com/journalrank.php
		2.2 Traditional methods of statistical analysis.	6			
		2.3 Nonparametric methods.	6			
		2.4 Calculating the rank of uncertainty through mathematical models.	4			

Unit 3 Process of the scientific investigation.	Students are able to identify, state, and solve problems. Students develop reading comprehension abilities and management abilities to look for scientific bibliographic information. Students present their research projects orally and in writing.	3.1 Data presentation	2	Teaches the concepts and describes the elements to present a research project. Guides students to design their research topic by applying the knowledge seen in class. Designs and assigns homework that promote feedback of the topics seen in class	Students… Play an essential role by finding information and discussing the different concepts stated by the professor Do homework of the unit concepts. Solve some exercises on the topic. Search, organize, and synthesize information in order to present their research topic in a structured way.	Tramullas, J. S. *Tendencias de Investigación en Documentación,* Madrid, Spain: Librería General.
		3.2 Discussion	2			
		3.3 Public presentation. Most frequent errors.	2			
		3.4 Perspectives and further research	2			

COURSE EVIDENCE **(Deliverables)** - Project presentation file - Evidence of discussion: characterization techniques (diagrams, presentations, mind maps). - Evidence of statistical analysis (screenshots and data analysis). - Final research project.

10.-PROFESSOR'S PROFILE
Professionals in the different fields of chemistry, with experience in developing research projects and using electronic databases to search for bibliographic information. Knowledge of didactic methodologies.

11.-AUTHOR OF THE LEARNING UNIT
Gilberto Velázquez Juárez.

12.-MODIFICATION AND UPDATE
October 27, 2016