CHM-218: ANALYTICAL CHEMISTRY - INSTRUMENTAL ANALYSIS

Time Stamp:

Wed Jul 05 2023 11:09:52 GMT-0500 (CDT)

Approval Path

a. Fri, 26 Nov 2021 15:12:36 GMT
Caitlin Burns (cburns): Rollback to Initiator
b. Mon, 20 Dec 2021 20:09:10 GMT
Caitlin Burns (cburns): Approved for BICHM Chair
c. Mon, 20 Dec 2021 20:23:29 GMT
Maria Isaza (misaza): Rollback to BICHM Chair for HNS Dean
d. Wed, 09 Feb 2022 18:21:03 GMT
Caitlin Burns (cburns): Rollback to Initiator
e. Wed, 09 Feb 2022 18:25:48 GMT
Caitlin Burns (cburns): Approved for BICHM Chair
f. Wed, 09 Feb 2022 18:28:06 GMT
Maria Isaza (misaza): Approved for HNS Dean
g. Thu, 24 Feb 2022 20:30:02 GMT
John Soltes (jsoltes): Rollback to HNS Dean for General Education Committee Chair
h. Thu, 24 Feb 2022 21:02:27 GMT
Maria Isaza (misaza): Rollback to BICHM Chair for HNS Dean
i. Tue, 08 Mar 2022 12:17:10 GMT
Caitlin Burns (cburns): Approved for BICHM Chair
j. Tue, 08 Mar 2022 21:24:43 GMT
Maria Isaza (misaza): Approved for HNS Dean
k. Tue, 05 Apr 2022 17:38:26 GMT
John Soltes (jsoltes): Approved for General Education Committee Chair
l. Tue, 01 Nov 2022 21:49:51 GMT
Christine Kelly (ckelly): Rollback to BICHM Chair for Curriculum Committee Chair
m. Wed, 02 Nov 2022 16:08:44 GMT
Caitlin Burns (cburns): Approved for BICHM Chair
n. Mon, 07 Nov 2022 18:52:42 GMT
Maria Isaza (misaza): Approved for HNS Dean
o. Wed, 08 Feb 2023 17:12:35 GMT
John Soltes (jsoltes): Approved for General Education Committee Chair
p. Fri, 03 Mar 2023 18:11:11 GMT
Christine Kelly (ckelly): Approved for Curriculum Committee Chair
q. Mon, 20 Mar 2023 12:05:13 GMT
Patrick Enright (penright): Rollback to HNS Dean for VPPSAS
r. Wed, 22 Mar 2023 19:39:16 GMT
Maria Isaza (misaza): Approved for HNS Dean
s. Tue, 11 Apr 2023 13:44:52 GMT
John Soltes (jsoltes): Approved for General Education Committee Chair
t. Wed, 12 Apr 2023 13:05:21 GMT
Christine Kelly (ckelly): Approved for Curriculum Committee Chair
u. Mon, 24 Apr 2023 12:46:43 GMT
Patrick Enright (penright): Approved for VPPSAS

History

a. Apr 29, 2019 by ndreyfus
b. Feb 11, 2021 by Nicole Williams (nwilliams)

Date Submitted: Wed, 09 Feb 2022 18:23:54 GMT

Last approved: Thu, 11 Feb 2021 17:27:10 GMT
Last edit: Wed, 02 Nov 2022 16:08:29 GMT

Course Type:
Credit

Credit Type:
Institutional

Course Prefix:
CHM
Course Number:
218

Course Capacity:
14

General Education?
Yes

Department:
Biology and Chemistry (BICHM)

Division:
School of Health Professions and Natural Sciences

Course Title:
Analytical Chemistry - Instrumental Analysis

Abbreviated Course Title:
Analytical Chemistry - Instrum

Effective Date:
Fall 2021

Credit Hours:
Lecture: 3
Lab: 1.0
Recitation:
Clinical:
Cooperative:
Studio:
TOTAL: 4

Catalog Credits:
4

Course Fee:
Yes

General Education Information
Categories:
Science

Category Learning Outcomes Which Will Be Achieved:
Apply the scientific method of inquiry to gain scientific knowledge.

Catalog Course Description:
Spring Semester only. This survey course covers theory and applications of modern instrumentation utilized to solve problems in chemical analysis. Laboratory work involves hands-on experience utilizing instruments such as gas (GC), liquid (HPLC) and ion chromatography; spectrophotometric methods including visible, ultraviolet, infrared (FTIR) and atomic absorption; ICP and other methods, including ion selective electrode methods; and electrophoretic methods including capillary electrophoresis (HPCE).

Emphasis is placed on the comparison of methods, the collection and interpretation of laboratory data, technical report writing and record keeping. All remedial courses listed must be completed prior to taking this course.

Catalog Prerequisites:

ENG-111 or ENG-111CL or ENG-111CW and CHM-127 or equivalent (minimum grade of C)

Crosslisted

No

Textbooks:

Title	Ed	Author(s)	Publisher	ISBN	Req/Rec
Chemical Analysis: Modern Instrumentation Methods & Techniques		Rouessac	Wiley		Required
Instrumental Methods of Analysis Laboratory Laboratory Manual		Berger & Flanagan	CCM		Required

Supplemental Materials:

Principles of Instrumental Analysis by Skoog and Leary; Saunders College Publishing
Scientific calculator
Flash Drive (1 Gb min.)
Safety goggles (required)
Bound notebook (required)
Laboratory coat (optional)

Specialized equipment, supplies, facilities, for classes limited by enrollment or restricted by accreditation and/or equipment limitations:
(Information will be used to determine differential funding category.)

Class size is limited to 14 students because of instrumentation and safety requirements

Course Content:

Topics

1. Introduction to Analytical Science
2. Sampling and Sample Preparation
3. Laboratory Statistics and Uncertainties in Measurement
4. Computer Software: Chemdraw and Microsoft Excel
5. Solution Preparation
6. Introduction to Spectroscopy: Electromagnetic Radiation, Beer's Law
7. Visible Spectrocopy: Theory and Applications
8. Analytical Separations
9. UV-vis and IR Spectroscopy: Theory and Applications
10. Atomic Absorption Spectroscopy: Theory and Applications
11. Gas Chromatography: Theory and Applications
12. High Pressure LIquid Chromatography: Theory and Applications
13. Electroanalytical Techniques
14. Bioanalysis

Statement of Course Learning Outcomes:

Learning Outcomes

1. Apply the scientific method, analyze a problem and draw conclusions from data and evidence. (Gen. Ed.) Assessments: laboratory reports and special design project/report grade.
2. Use laboratory procedures with a minimum of supervision. Assessments: laboratory report grades.
3. Demonstrate the ability to assess laboratory data, record data, solve scientific calculations, and calculate statistics. Assessments: laboratory report grades, homework/quizzes, and examinations.
4. Show the ability to maintain a laboratory notebook and employ software to write technical reports. Assessments: notebook and laboratory report grades.

5. Compose technical reports and an oral presentation to demonstrate familiarity with instrumental techniques. Assessments: laboratory report grades and oral presentation.

Learning Activities: interactive lecture activities (assigned readings, presentations, animations and videos, discussions, and/or other activities) and laboratory activities (laboratory experiments, experimental design, data collection/analysis, computer searches, and presentations).

Statement of Relation to Curriculum(s):

This is a General Education Course. This course is required for students in Chemical Technology (3450) and Environmental Science (3451). It is used as a capstone course in these programs. This course can be used as a restricted Elective for Chemistry (2152). Other majors may treat this course as free elective credit. Can be used as General Science Education Elective.

Format for offering the course:

(check all that apply)

Traditional

Key: 10319