V10-day

39-UCCh.

FORMAT 2

Submit originals (including syllabus) and one copy and electronic copy to the **Faculty Senate Office**
See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/ for a complete description of the rules governing curriculum & course changes.

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

Attach a syllabus, except if dropping a course.

SUBMITTED BY:

Department	Chemistry and Biochemistry	**College/School**	School of Natural Sciences and Mathematics
Prepared by	Sarah Hayes	**Phone**	907-474-7118
Email Contact	S.Hayes@alaska.edu	**Faculty Contact**	same

1. *COURSE IDENTIFICATION: As the course now exists.*

Dept: CHEM | Course #: 413 | No. of Credits: 3

COURSE TITLE: Analytical Instrumental Laboratory

2. *ACTION DESIRED: Changes to be made to the existing course.*

Change Course [X] If Change, indicate below what change. Drop Course [ ]

NUMBER	[X]	**TITLE** [ ]	**DESCRIPTION** [X]
PREREQUISITES	[X]		***FREQUENCY OF OFFERING*** [ ]
CREDITS (including credit distribution)	[ ]		***COURSE CLASSIFICATION*** [ ]
CROSS-LISTED	[ ]	Dept. [ ]	(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)
STACKED (400/600) *Include syllabi.*	[ ]	Dept. [ ]	Course # [ ]
OTHER (please specify)	[ ]		

3. *COURSE FORMAT*

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council **and** the appropriate Faculty Senate curriculum committee. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

COURSE FORMAT: (check **all** that apply) [ ] *1* [ ] *2* [ ] *3* [ ] *4* [ ] *5* [X] *6 weeks to full semester*

OTHER FORMAT (specify all that apply)

Mode of delivery (specify lecture, field trips, labs, etc): **1hour per week lecture, 6 hours per week lab.**

4. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities [ ] S = Social Sciences [ ]

Will this course be used to fulfill a requirement for the baccalaureate core? YES [ ] NO [X]

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6 also submitted [ ]

W = Writing Intensive, Format 7 submitted [X]

Natural Science, Format 8 submitted [X]

5. COURSE REPEATABILITY:

Is this course repeatable for credit? YES [ ] NO [X]

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit? [0] TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? [ ] CREDITS

RECEIVED

SEP 20 2012

Dean's Office
College of Natural Science & Mathematics

Governance 9/27/12 RLP

6. *CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, title and credits*

CHEM 413 Analytical Instrumental Laboratory
3 Credits
Offered Spring

A laboratory course focusing on the acquisition and interpretation of chromatographic and spectroscopic data for quantitative chemical measurements. Students will learn effective experimental planning and execution, critical evaluation of experimental data and written communication in the context of the chemical sciences. Special fees apply. Prerequisites: CHEM F212; ENGL F111X; ENGL F211X or ENGL F213X; Co-requisite: CHEM F332; Chemistry major or permission of instructor. (3+0)

7. *COMPLETE CATALOG DESCRIPTION AS IT WILL APPEAR WITH THESE CHANGES: (Underline new wording ~~strike through old wording~~ and use complete catalog format including dept., number, title, credits and cross-listed and stacked.) PLEASE SUBMIT NEW COURSE SYLLABUS. For stacked courses the syllabus must clearly indicate differences in required work and evaluation for students at different levels.*

CHEM 3XX Analytical Instrumental Laboratory
3 Credits
Offered Spring

A laboratory course focusing on the acquisition and interpretation of ~~chromatographic and~~ spectroscopic and chromatographic data for qualitative characterization and quantitative chemical measurements. Students will learn to design and execute experiments with a variety of instruments, critically evaluate experimental data, and communicate their findings through scientific writing~~effective experimental planning and execution, critical evaluation of experimental data and written communication in the context of the chemical sciences~~. Special fees apply. Prerequisites: CHEM F212; ~~ENGL F111X;~~ ENGL F211X or ENGL F213X; ~~Co-requisite: CHEM F332;~~ Chemistry major or permission of instructor. (3+0)

8. *IS THIS COURSE CURRENTLY CROSS-LISTED?*

YES/NO [N] If Yes, DEPT [ ] NUMBER [ ]

(Requires written notification of each department and dean involved. Attach a copy of written notification.)

9. *GRADING SYSTEM: Specify only one*

LETTER: [X] PASS/FAIL: [ ]

10. *ESTIMATED IMPACT*

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

none

11. *LIBRARY COLLECTIONS*

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No [ ] Yes [X] Spoke with Anne Christie and the current holdings are sufficient. 9-6-2012

12. *IMPACTS ON PROGRAMS/DEPTS:*

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

This course is currently taken by chemistry majors, thus only the chemistry and biochemistry department would be affected by this change.

13. ***POSITIVE AND NEGATIVE IMPACTS***

*Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.*

The course is currently taught at the 400-level. This course change would allow students to take a "W" class earlier in their education and become familiar with instruments used in other courses.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

Changing this course is a program enhancement that increases courses targeting mid-level students. The course selection currently available to sophomores is somewhat limited. This course would also expose students to more instruments used in chemical analysis earlier in their education, making them more attractive candidates in research and industry. Developing these research and writing skills earlier may also funnel more undergraduates into research at UAF. Removing the physical chemistry co requisite and changing the class from a 400 to a 300 level course means the course would be less math and more instrument-intensive course suitable for sophomore and junior level students.

APPROVALS: (Additional signature blocks may be added as necessary.)

(Collin Simpson) Date 20 Sep 2012

Signature, Chair, Program/Department of: Chemistry and Biochemistry

Date 9/26/2012

Signature, Chair, College/School Curriculum Council for: CNSM

Date 9/26/12

Signature, Dean, College/School of: CNSM

Date

Signature of Provost (if applicable)

Offerings above the level of approved programs must be approved in advance by the Provost.

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE.

Date

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

ADDITIONAL SIGNATURES: ***(As needed for cross-listing and/or stacking)***

	Date		
Signature, Chair, Program/Department of:			
	Date		
Signature, Chair, College/School Curriculum Council for:			
	Date		
Signature, Dean, College/School of:			

Analytical Instrumental Laboratory
CHEM 3XX; Spring 2014

UNIVERSITY OF ALASKA FAIRBANKS

Course Name: CHEM 3XX, 3 credits, writing intensive
Prerequisites: CHEM 212, ENGL 211X, and/or 213X.
Location:
Meeting Time: MW 2:15-5:15 (lab), F 2:15-3:15 (lecture)
Instructor: Dr. Sarah Hayes
Office: Reichardt, 188
Phone: 907-474-7118
Email: s.hayes@alaska.edu
Office Hours: MW 10:30-12 and by appointment

Blackboard Link: http://classes.uaf.edu
Recommended Materials:
Sawyer, Heineman and Beebe, **Chemistry Experiments for Instrumental Methods** (978-0471893035)

Course Description: A laboratory course focusing on the acquisition and interpretation of spectroscopic and chromatographic data for qualitative characterization and quantitative chemical measurements. Students will learn to design and execute experiments with a variety of instruments, critically evaluate experimental data, and communicate their findings through scientific writing. Special fees apply. Prerequisites: CHEM F212; ENGL F211X or ENGL F213X; Chemistry major or permission of instructor.

Instructional Methods: This class is based on characterizing a Consumer Product (CP) given to each student on the first day of class. Throughout the semester, students will use a variety of instrumentation to characterize different parts of their CP both individually and in groups. In lecture, students will learn to correctly apply, diagram, and troubleshoot instruments. They will apply this knowledge in lab by designing experiments and learning to use instruments to characterize their CP. A written final report will be prepared throughout the semester in sections and reviewed by peers and the instructor.

Course Goals: Students will learn to design an experiment, select appropriate instrumentation, research and apply laboratory procedures, carry out experiments, analyze data, and write it all up in a scientific report.

Student Learning Outcomes:

- Students will be able to diagram spectroscopic and chromatographic instrumentation and select the appropriate instrument for a particular problem.

Analytical Instrumental Laboratory
CHEM 3XX; Spring 2014

- Students will be able to research and apply instrumental methods for characterizing materials. Then perform the experiment.
- Students will compose a scientific report in the ACS style to justify and document experiments, interpret results, and draw conclusions.

Course Policies:

Attendance and Tardiness- Students are expected to attend class and not compromise the experience of other students. A social contract will be negotiated between students and instructor on the first day of class.

Academic integrity, Plagiarism, Cheating- Students are expected to conduct themselves professionally and breaches of academic integrity will be dealt with in accordance with the Department of Chemistry and Biochemistry policies.

Participation- Much of this class is based on collaboration, making participation essential to success.

Late work- Late work will not be accepted.

Course Evaluation:

Grades are assigned on the typical scale 90-100 A, 80-90 B, 70-80 C, etc.

Activity	Break down	points
Lab notebook use and maintenance (individual)*		200
Project definition (team)*		100
Peer reviews of project definition (individual)*		100
Sample prep and procedures (individual & team)	6 x 20 pts	120
Reports (individual & team)*	5 x 20 pts	100
Peer reviews of preliminary analysis (individual)*		100
Final report (team)*		100
Oral presentation of final report (team)		100
Lecture exam		80
total		1000

* Indicates writing assignments.

Lab notebook- Maintaining a tidy, individual lab notebook is essential in science and is required for this course. Lab notebooks will be checked during each lab period dedicated to experimentation. A dedicated 3-ring binder, spiral notebook, or bound lab notebook are acceptable. No loose pages are allowed. Pages may be taped into the notebook, as necessary. Before coming to lab, each student must have a procedure, and data tables prepared.

Peer Reviews- Several writing assignments will be peer-reviewed by your classmates. Learning to write a (good) review is an essential skill for a scientist and will help you improve your writing by getting a fresh perspective. Reviews are to be

written professionally and give both positive and constructive feedback. Additional details will be discussed in class and grading rubrics and examples will be available on blackboard.

Project definition- Your project definition will contain: a description of your product, your questions to answer, and justification of the instruments you intend to use to address each question. Additional details will be discussed in class and grading rubrics will be available on blackboard.

Sample preparation and instrumental procedures- Prior to performing an experiment, students will write a detailed description of their plan in their lab notebook. It will detail how you intend to prepare and analyze your samples by including: a purpose, step by step instructions to a level of detail that another student could easily replicate your work, a list of all reagents and materials needed, a description of what you expect to find and/or how you will analyze the data, and include references to any outside sources consulted. Additional details will be discussed in class and grading rubrics and examples will be available on blackboard.

Reports- Will include an introduction (recycle from the project definition, but make it concise and coherent), a concise materials an methods (a paired down version your sample preparation and instrumental procedures), results (1-2 manageable paragraphs), discussion (1-2 manageable paragraphs), and conclusions (1-2 sentences saying what you found). Remember that your peers will be reading these reports. Bring 3 copies (2 without your name on them) to class to turn them in. Peer review items and report will be collected together and graded by the instructor before return. Additional details will be discussed in class and grading rubrics and examples will be available on blackboard.

Final report- Bring it all reports together into the final report. Mostly this will be revised versions of the reports you have been generating all semester that have been revised as a result of the reviews you have been receiving. Grading of final reports will be performed by the instructor.

Oral presentations- Share what you learned in your project with the rest of the class in a 20-30 minute presentation. Tell us about your product.

Lecture exam- This will cover the material learned in the lecture though out the semester.

Disability Services: I will work with the Office of Disabilities Services (208 Whitaker Bldg, 474-5655) to provide reasonable accommodation to students with disabilities.

Analytical Instrumental Laboratory
CHEM 3XX; Spring 2014

UNIVERSITY OF ALASKA FAIRBANKS

Tentative Schedule (L= lecture)

Date	Session	Activities	Due dates
1-18	L1	Get acquainted, discuss structure, select project	
1-23	1	Experimental design Planning, writing Project definition	
1-25	L2	Spectroscopy	
1-28	2, 3	Build a UV-Vis Planning, writing Project definition	
2-1	L3	Statistical review Calibration curves, least squares analysis	
2-4	4, 5	UV-Vis experiment- washing glassware Planning, writing Project definition	
2-8	L4	Experimental design	UV-Vis report (individual)
2-11	6, 7	Planning, writing Project definition	
2-15	L5	Review process, Spectroscopy: FT-IR	Project definition (team)
2-18	8, 9	Writing reviews of Project definition Planning FT-IR	
2-22	L6	Project definition reviews Spectroscopy: AA	PD reviews (individual)
2-25	10-11	FT-IR, planning AA	FT-IR procedure (team)
3-1	L7	Spectroscopy: XRF	FT-IR report (team)
3-4	12-13	AA, planning XRF	AA procedure (team)
3-8	L8	Spectroscopy: ICP-MS	FT-IR Reviews (individual)
3-18	14-15	XRF planning ICP-MS	XRF procedure (individual)
3-22	L9	Scattering: XRD	XRF and AA report (team)
3-25	16- 17	ICP-MS planning XRD	ICP-MS procedure (team)
3-29	L10	Separations: GC-MS	ICP-MS report (team)

			XRF and AA reviews (individual)
4-1	18-19	XRD	XRD procedure (individual)
4-5	L11	Separations: LC-MS	XRD report (individual) ICP-MS reviews (individual)
4-8	20-21	Project instruments	
4-12	L12	Separations: HPLC	
4-15	22-23	Project instruments	
4-19	L13	Separations: CE	
4-22	24-25	Project instruments	
4-26	L14	Electron microscopy	Final report (team)
4-29	26-27	SEM, clean up Presentations (team)	
5-3	L15	Lecture exam	
5-6	28	Presentations (team)	