



Academic Notes

ACADEMIC NOTES PUBLICATION SCHEDULE

Below is the publication schedule for the electronic copy of *Academic Notes* through August 11, 2014. All submissions for inclusion in *Academic Notes* are due in the Office of Academic Affairs no later than 11:00 a.m. on the Deadline for Items date shown below. Submissions must be in hard copy along with an email, zip drive, or CD with the same information. The electronic version must be formatted either in Word with pages with signatures scanned and inserted as a picture OR PDF saved as text and image. (Do NOT send PDF just saved as an image.) Information submitted to *Academic Notes* that is not accompanied by an electronic version or that is incomplete or unusable will be returned to the appropriate office. *Academic Notes* is available using Acrobat Reader at http://www.indstate.edu/academicaffairs/academic_notes.htm

If you have questions, please contact Yvonne Russell in Academic Affairs, extension 3662.

ACADEMIC NOTES PUBLICATION SCHEDULE

FALL 2014

<u>Deadline for Items</u>	<u>Issue Date</u>
August 27	September 8
September 3	September 15
September 10	September 22
September 17	September 29

CURRICULUM

INDEX

Item	Page #
Undergraduate Proposals	
<i>Course Revisions</i>	
CHEM 321, 321L, 421	3
CHEM 421L	4
<i>New Programs</i>	
Unmanned Systems Major	4
Graduate Proposals	
<i>Course Revisions</i>	
CHEM 521	7
CHEM 521L	8

UNDERGRADUATE PROPOSALS

COURSE REVISIONS

COLLEGE OF ARTS AND SCIENCES: Chemistry and Physics

CHEM 321 - Analytical Chemistry

3 credits

An introduction to the principles and practices of quantitative analytical chemistry. The course covers the fundamentals of statistical data analysis, application of chemical equilibria to gravimetry and titrimetry, electrochemistry, chemical separations, and spectroscopy.

Prerequisites: CHEM 106, 106L, and concurrent enrollment in CHEM 321L.

Change description and title to:

CHEM 321 - Analytical Chemistry I

3 credits

CHEM 321 is the first in a two-course sequence followed by CHEM 421, and is an introduction to the principles and practices of quantitative analytical chemistry with an emphasis on classical quantitative analytical chemistry.

Prerequisites: CHEM 106, 106L, and concurrent enrollment in CHEM 321L.

A-F Grading

Effective term: Fall 2015

CHEM 321L - Analytical Chemistry Laboratory

1 credits

A series of laboratory-based experiments that provide students hands-on experience with the application of fundamental analytical chemistry laboratory techniques.

Prerequisites: CHEM 106, 106L, and concurrent enrollment in CHEM 321.

Change description and title to:

CHEM 321L - Analytical Chemistry I Laboratory

1 credits

CHEM 321L is the laboratory counterpart to CHEM 321 and provides students with practical hands-on experience with many of the most fundamental techniques that are the foundation of classical quantitative analytical chemistry.

Prerequisites: CHEM 106, 106L, and concurrent enrollment in CHEM 321.

A-F Grading

Effective term: Fall 2015

CHEM 421 – Instrumental Methods of Analysis

3 credits

Principles and applications of instrumental analytical chemistry, including signal and noise analysis, design and application of atomic and molecular spectroscopic and mass spectrometric instrumentation, and chromatographic methods of separation are discussed.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in 421L.

Note: Open to graduate students. Graduate students are required to do additional work of

research nature.

Change description and title to:

CHEM 421 - Analytical Chemistry II

3 credits

A continuation of CHEM 321. This course is a comprehensive study of the fundamental principles and applications of modern instrument-based analytical chemistry.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in 421L.

Note: Open to graduate students. Graduate students are required to do additional work of a research nature.

A-F Grading

Effective term: Fall 2015

CHEM 421L – Instrumental Methods of Analysis Laboratory

1 credits

A series of experiments that provide students hands-on experience with a variety of advanced analytical instruments, their components, and their functions.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in CHEM 421.

Note: Open to graduate students. Graduate students are required to do additional work of a research nature.

Change description and title to:

CHEM 421L - Analytical Chemistry II Laboratory

1 credit

CHEM 421L is the laboratory counterpart to CHEM 421. This course provides students practical hands-on experience with modern analytical instruments, their components, and applications.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in CHEM 421.

Note: Open to graduate students. Graduate students are required to do additional work of a research nature.

A-F Grading

Effective term: Fall 2015

NEW PROGRAMS

COLLEGE OF TECHNOLOGY: Aviation Technology

Unmanned Systems Major (49 credits)

CIP CODE: 49.0101 Major Code:

Brief Summary:

The Bachelor of Science (B.S.) in Unmanned Systems is specifically designed to address the need of students who wish to pursue opportunities and careers in this new and burgeoning field. The industry term is “unmanned”, but the systems are completely dependent upon humans. People must operate, maintain, and support the vehicles, communications networks, computer systems, and other infrastructure elements in support of operations, research, testing, and development.

Capabilities in unmanned systems (mobile robotics) provide new methods to address problems and business opportunities. However, the most important component in any unmanned system is the human element which requires education and training. The degree will prepare graduates to become successful and advance their careers while contributing to the development of an educated workforce in Indiana.

The focus of the B.S. is to provide professionals the opportunity to gain expertise needed for self-enrichment and to expand their professional roles in various technology positions in numerous applicable areas. Just as computer systems are used in every aspect of human life today, unmanned systems will eventually be embedded in every field and industry. The course of studies will incorporate activities that will provide extended experiential learning and require students to communicate and collaborate on projects.

The Bachelor of Science in Unmanned Systems is designed to accommodate the unique demands for entry and advancement within the aerial, land, and water vehicles/robotics workforce of the future. The B.S. in Unmanned Systems will require 120 undergraduate credit hours. Students will have to complete the foundational studies courses requirements. The core courses consist of 49 credit hours: 21 credit hours in Unmanned Systems Core and 28 credit hours in Aviation Core. In addition, students will be encouraged to complete a minor in an area of interest where unmanned systems will be a key technology in the future.

Successful graduation will require a minimum of 120 credits; and, a minimum of 45 of the 120 credit hours are required at the 300-400 level, and a minimum cumulative grade point average (GPA) of 2.0 on a 4.0 scale. Each UMS and AVT Core course in the degree must be passed with a C grade (2.0 points) or higher. AVT 141 (6 credit hours) will substitute for UMS 181 (3 credit hours). AVT142 (3 credit hours) will substitute for AVT143 (3 credit hours).

Students are strongly encouraged to pursue a Minor field of study, especially in areas where unmanned systems may play a large role in the future. By learning and understanding a field of expertise, students will be able to effectively apply the technology to a business area. Suggested minors include Aviation Technology, Criminology and Criminal Justice, Geographic Information Science, Computer Engineering Technology, Computer Science, Communication, and Business Administration. Many other ISU minors are available as well as the opportunity to obtain a double major.

The program will utilize existing courses and faculty members who are already in place. The courses of the Unmanned Systems core are being taught to support the current minor. Required equipment and facilities are likewise in place already.

This degree will fill gaps that currently exist for Indiana students who wish to pursue B.S. degrees in unmanned systems with applicability to aviation, criminology, computer science, and earth and environmental science, for examples. The program is student-centered focusing on the needs of the learner; and, mission driven as it supports several initiatives at the departmental,

collegiate, and university levels. It is workforce aligned as it provides a path for students that prepares them for a career in a highly skilled and growing industry.

Student Learning:

This is a new degree program that has been designed with student outcomes assessment in mind. Student outcomes assessment will be undertaken in a timely manner to ensure program effectiveness and student success.

Proposed Catalog Copy:

Unmanned Systems Major (49 credits)

CIP CODE: 49.0101 Major Code:

Required Courses:

Unmanned Systems Courses (49 credits):

Unmanned Systems Core Courses (21 credits):

- UMS 181 – Flight Theory for Non-Aviation Majors – 3 Credits *
- UMS 281 – Introduction to Unmanned Systems - 3 Credits
- UMS 382 – Mechanics of Unmanned Systems - 3 Credits
- UMS 385 – Human Factors of Unmanned Systems - 3 Credits
- UMS 483 – Payloads and Sensors - 3 Credits
- UMS 485 – Communications and Data Links - 3 Credits
- UMS 491 – Advanced UAS Operations - 3 Credits

Aviation Department Core Courses (28 credits):

- AVT 130 – Introduction to Aviation Technology - 2 Credits
- AVT 143 – Introduction to Flight - 1 Credit **
- AVT 223 – Aviation Weather Services - 3 Credits
- AVT 307 – Airport Operations - 3 Credits
- AVT 309 – Aviation Security and Emergency Management - 3 Credits
- AVT 323 – Air Traffic Control Systems - 3 Credits
- AVT 325 – Crew Resource Management - 3 Credits
- AVT 405 – Aviation Law - 3 Credits
- AVT 425 – Aviation Safety Management Systems - 3 Credits
- AVT 430 – Aviation Career Planning - 1 Credit
- AVT 471 – Topics for Aviation Majors – 3 Credits

* AVT 141 – Private Pilot Theory (6 Credits) will substitute for UMS 181 (3 Credits).

** AVT 142 – Private Pilot Flight I will substitute for AVT 143 – Introduction to Flight.

Document Requirement:

- **UMS483, UMS485, and UMS491 require compliance with the** International Traffic in Arms Regulations (ITAR) imposed by the State Department of the United States. These courses are open to US Citizens only. Proof of citizenship must be on file in the Aviation Department prior to taking these courses.

Note:

- All Unmanned Systems students must pass each UMS and AVT course, used in their program, with a C grade (2.0 points) or higher.
- **UMS483, UMS485, and UMS491 require compliance with the** International Traffic in Arms Regulations (ITAR) imposed by the State Department of the United States. These courses are open to US Citizens only. To complete either the Bachelor of Science or the minor in Unmanned Systems, the student must be a US citizen.
- Students are strongly encouraged to pursue a Minor field of study, especially in areas where unmanned systems may play a large role in the future. By learning and understanding a field of expertise, students will be able to effectively apply the technology to a business area. Suggested minors include Aviation Technology, Criminology and Criminal Justice, Geographic Information Science, Computer Engineering Technology, Computer Science, Communication, and Business Administration. Other ISU minors are available as well as the opportunity to obtain a double major.

Effective term: Fall 2015

GRADUATE PROPOSALS

COURSE REVISIONS

COLLEGE OF ARTS AND SCIENCES: Chemistry and Physics

CHEM 521 – Instrumental Methods of Analysis

3 credits

Principles and applications of instrumental analytical chemistry, including signal and noise analysis, design and application of atomic and molecular spectroscopic and mass spectrometric instrumentation, and chromatographic methods of separation.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in 521L.

Note: Three class hours and three laboratory hours per week.

Change description and title to:

CHEM 521 - Analytical Chemistry II

3 credits

A continuation of CHEM 321. This course is a comprehensive study of the fundamental principles and applications of modern instrument-based analytical chemistry.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in 521L.

A-F Grading

Effective term: Fall 2015

CHEM 521L – Instrumental Methods of Analysis Laboratory

1 credits

A series of experiments that provide students hands-on experience with a variety of advanced analytical instruments, their components, and their functions.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in CHEM 521.

Change description and title to:

CHEM 521L - Analytical Chemistry II Laboratory

1 credit

CHEM 521L is the laboratory counterpart to CHEM 521. This course provides students practical hands-on experience with modern analytical instruments, their components, and applications.

Prerequisites: CHEM 321, 321L, and concurrent enrollment in CHEM 521.

A-F Grading

Effective term: Fall 2015