

# PHA5933 Principles of Pharmacy Informatics

Spring, 2022

*2 Credit Hours – [A-E Grading]*

This course is designed to introduce the theory and concepts of pharmacy informatics and health informatics. Pharmacy informatics focuses on medication-related data and knowledge within the continuum of the healthcare system (HIMSS.) It offers a platform for students who are interested in pharmacy informatics careers. Students will develop the knowledge to discuss the nature of health informatics as an important discipline; and recognize different methods used to analyze fundamentals of workflow process analysis, system redesign, usability, and human factors.

## Teaching Partnership Leaders

Khoa A Nguyen, PharmD.

- Email: [khoanguyen@cop.ufl.edu](mailto:khoanguyen@cop.ufl.edu)
- Office: DG 21
- Phone: 352-273-9418

Office Hours: See Canvas for posted office hours.

*See Appendix A. for Course Directory of Faculty and Staff Contact Information.*

## Entrustable Professional Activities

This course will prepare you to perform the following activities which the public entrusts a Pharmacist to perform:

1. Practice manager domain  
Implement health information technology to improve pharmacy operations.  
Assist in the evaluation of pharmacy practice and workflow.
2. Information master domain  
Retrieve and analyze scientific literature (especially in the area of informatics) to make a recommendation.  
Analyze clinical guidelines to develop meaningful clinical decision support tools.
3. Population health promoter domain  
Minimize adverse drug events and medication errors through health information technology.  
Maximize the appropriate use of medications in a population with clinical decision support and order set.
4. Interprofessional team member domain  
Collaborate as a member of an interprofessional team to evaluate and develop health information technology.

## Course-Level Objectives

Upon completion of this course, the student will be able to:

1. Recognize the importance of health informatics and pharmacy informatics in improving the quality and safety of patient care.
2. Recognize the importance of data standards in healthcare systems. Describe some common data standards currently used in pharmacy area.

3. Apply fundamentals concepts of human-computer interaction and human factors in workflow process analysis and system redesign.
4. Analyze human errors and apply usability evaluation methods to design Electronics Health Records (EHRs).
5. Explain the difference between Electronic Health Records (EHRs) and Personal Health Records (PHRs)
6. Recognize the use and potential of artificial intelligence and machine learning methods in pharmacy practice
7. Describe the emerging of telehealth and telemedicine and how they can be used to support clinical service.

## Course Pre-requisites

Successful completion of Doctor of Pharmacy coursework through block 11

## Course Co-requisites

None

## Course Outline

See Appendix for course breakdown. Please routinely check your campus calendar and the Canvas course site for any messages about changes in the schedule including meeting dates/times, deadlines, and room changes.

## Required Textbooks/Readings

1. Students will learn through pre-recorded lectures and articles provided through the Canvas course site

Use [UF VPN to access UF Libraries Resources](#) when off-campus.

The UF HSC library staff can assist you with questions or issues related to accessing online library materials. For assistance contact your College of Pharmacy librarian or visit the [HSC Library Website](#) at this URL:<http://www.library.health.ufl.edu/>

## Suggested Textbooks/Readings

Suggested readings will be posted on Canvas.

Suggested book: Berner ES, Clinical Decision Support Systems: Theory and Practice, 3rd Edition. Springer. ISBN-13: 978- 3319319117

## Other Required Learning Resources

None

## Materials & Supplies Fees

None

## Student Evaluation & Grading

Table 1.1 Evaluation and Grading Above

| Requirements  | Percentage of Final Grade |
|---|---------------------------|
| Quizzes - 7 quizzes - each worth 7.14% of final grade | 50%                       |
| Final Project   | 25%                       |
| Final presentation                                    | 25%                       |
| <b>Total</b>  | <b>100%</b>               |

Table 1.2 grading scale

| Percentage   | Letter Grade |
|--------------|--------------|
| 92.50-100%   | A            |
| 89.50-92.49% | A-           |
| 86.50-89.49% | B+           |
| 82.50-86.49% | B            |
| 79.50-82.49% | B-           |
| 76.50-79.49% | C+           |
| 72.50-76.49% | C            |
| 69.50-72.49% | C-           |
| 66.50-69.49% | D+           |
| 62.50-66.49% | D            |
| 59.50-62.49% | D-           |
| < 59.50%     | E            |

### Rounding of grades:

Final grades in Canvas will be rounded to the 2nd decimal place. If the decimal is X.495 or higher, Canvas will round the grade to X.50. The above scale depicts this policy and grades are determined accordingly. Grade assignment is made using this policy and NO EXCEPTIONS will be made in situations where a student's grade is "close."

## Educational Technology Use

The following technology below will be used during the course and the student must have the appropriate technology and software.

1. ExamSoft™ Testing Platform
2. Canvas™ Learning Management System

For technical support, navigate to [Educational Technology and IT Support Contact Information](http://curriculum.pharmacy.ufl.edu/current-students/technical-help/) at this URL: <http://curriculum.pharmacy.ufl.edu/current-students/technical-help/>

## Pharm.D. Course Policies

The Policies in the following link apply to this course. Review the General [Pharm.D. Course Policies](http://curriculum.pharmacy.ufl.edu/current-students/course-policies/) carefully, at this URL: <http://curriculum.pharmacy.ufl.edu/current-students/course-policies/>

## Makeup Assignments

Makeup assignments may be required for excused absences from all Active Learning Sessions. Students will be required to complete the makeup assignment within one week of the missed session.

## Late Assignments

For the final project, 10 points will be deducted for each day from the deadline. Late final projects also are accepted without penalty with appropriate excuses. Refer to Pharm.D. Course policies for requesting Excused absences. No late assignments accepted for quizzes.

## Respect for Diversity

The University of Florida College of Pharmacy strives to stimulate a culture that promotes diversity and inclusion within an exceptional community of students, faculty, and staff. It is our intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit.

We intend to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let us know ways to improve the course's effectiveness for you personally or for other students or student groups.

If any of our class meetings conflict with any of your religious events, an excused absence will be provided when requested using the standard UF COP process as detailed in the [UF COP Course policies](#).

If you feel that you have experienced or witnessed any bias/treatment that falls short of these expectations, you may submit a report through the UF [COP Student Mistreatment Report](#).

## Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## Appendix A. Course Directory

### Teaching Partnership Leader/Course Director(s):

Khoa A Nguyen, PharmD.

- Email: khoanguyen@cop.ufl.edu
- Office: DG 21
- Phone: 352-273-9418

Office Hours: Please see the Canvas course site for posted office hours

### Questions to Ask:

- Concerns about performance
- Guidance when there are performance problems (failing grades)
- General questions about content

### Other Teaching Partnership Faculty Members:

Wei (Jenny) Lo Ciganic, PhD.

- Email: wlociganic@cop.ufl.edu
- Office: HPNP3338
- Phone: 352-273-6255

Ben Staley, PharmD.

- Email: staleb@shands.ufl.edu
- Office: NA
- Phone: 352-733-3150

### Instructional Designer:

Kathryn Rush, MFA

- Email: krush@cop.ufl.edu
- Office: HPNP4309
- Phone: 352-273-6284

### Academic Coordinator Gainesville Campus:

Name: Ashleigh Langford, Academic Coordinator

- Email: lynn8597@cop.ufl.edu
- Office: HPNP 4312
- Phone: 352-273-6002

*Absence/Tardy Email: (Visit the course policy site for further instructions)*

## Educational Coordinators

Name: Katie Orben

- Email: [korben06@ufl.edu](mailto:korben06@ufl.edu)
- Office: Jacksonville Campus
- Phone: 904-244-9590

Name: Andrea Arredondo

- Email: [aarredondo1@cop.ufl.edu](mailto:aarredondo1@cop.ufl.edu)
- Office: Orlando Campus

### Questions to Ask:

- Issues related to course policies (absences, make up exams, missed attendance)
- Absence/tardy requests (Only the Academic Coordinator handles absence requests)
- Questions about dates, deadlines, meeting place
- Availability of handouts and other course materials
- Assignment directions
- Questions about grade entries in gradebook (missing grades, incorrect grade)
- Assistance with ExamSoft® (Distance campus students may contact the Educational
- Coordinator for use of Exemplify and assistance during exams. The Academic Coordinator is the contact person for issues related to grading and posting of ExamSoft grades.

## Appendix B: Course Outline:

| Date and Time      | Mod# | Activity                    | Unit Topic  | Contact Time [hr.]a | Responsible      |
|--------------------|------|-----------------------------|---|---------------------|------------------|
|                    | 0    | Module                      | Pre-Module Introduction                               |                     | Khoa Nguyen      |
| 4/27/22            | 0.1  | Video Lecture               | Introduction - Syllabus                               | 0.5                 | Khoa Nguyen      |
| 4/27/22            | 0.2  | Video Lecture               | Introduction - Final Project                          | 0.5                 | Khoa Nguyen      |
|                    | 1    | Module                      | Module 1 Medical informatics and pharmacy informatics |                     | Khoa Nguyen      |
| 4/27/22            |      | Video Lecture               | Medical informatics and pharmacy informatics          | 1                   |                  |
| 4/27/22            |      | Quiz Online Graded          | Quiz - Medical informatics and pharmacy informatics   | 0.5                 |                  |
|                    | 2    | Module                      | Module 2 Electronic health record                     |                     | Ben Staley       |
| 4/27/22            |      | Video Lecture               | Electronic health record                              | 1                   |                  |
| 4/27/22            |      | Quiz Online Graded          | Quiz - Electronic health record                       | 0.5                 |                  |
|                    | 3    | Module                      | Module 3 Data standard                                |                     | Ben Staley       |
| 4/27/22            |      | Video Lecture               | Data standard   | 1                   |                  |
| 4/27/22            |      | Quiz Online Graded          | Quiz Data standard                                    | 0.5                 |                  |
| 4/27/22, 2:15 -4pm |      | Active Learning Session--VC | 1 ALS Class Session                                   | 2                   | Khoa Nguyen      |
|                    | 4    | Module                      | Module 4 Human-computer interaction and Human Factors |                     | Khoa Nguyen      |
| 4/28/22            |      | Video Lecture               | Human-computer interaction and Human Factors          | 1                   |                  |
| 4/28/22            |      | Quiz Online Graded          | Quiz - Human-computer interaction and Human Factors   | 0.5                 |                  |
| 5/2/22, 3-4pm      |      | Active Learning Session--VC | 2 ALS Class Session - project preparation             | 1                   | Khoa Nguyen      |
|                    | 5    | Module                      | Module 5 Usability evaluation methods                 |                     | Khoa Nguyen      |
| 5/3/22             |      | Video Lecture               | An introduction to usability evaluation               | 1                   |                  |
| 5/3/22             |      | Quiz Online Graded          | Quiz - Usability evaluation methods                   | 0.5                 |                  |
|                    | 6    | Module                      | Module 6 Artificial Intelligent and Machine Learning  |                     | Jenny Lo-Ciganic |

| <b>Date and Time</b> | <b>Mod#</b> | <b>Activity</b>             | <b>Unit Topic</b>   | <b>Contact Time [hr.]a</b> | <b>Responsible</b> |
|----------------------|-------------|-----------------------------|---|----------------------------|--------------------|
| 5/4/22               |             | Video Lecture               | Introduction to Machine Learning in Pharmaceutical Science        | 1                          |                    |
| 5/4/22               |             | Quiz Online Graded          | Quiz - Artificial Intelligent and Machine Learning                | 0.5                        |                    |
|                      | 7           | Module                      | Module 7 Telehealth, telemedicine and Health Information Exchange |                            | Khoa Nguyen        |
| 5/5/22               |             | Video Lecture               | Telehealth, telemedicine and Health Information Exchange          | 1                          |                    |
| 5/5/22               |             | Quiz Online Graded          | Quiz - Telehealth, telemedicine and Health Information Exchange   | 0.5                        |                    |
| 5/6/22, 2:15- 4pm    |             | Active Learning Session--VC | 3 ALS Class Session - Final project discussion                    | 2                          | Khoa Nguyen        |
| 5/10/22, 2:15-4pm    |             | Active Learning Session--VC | 4 ALS Class Session - Final Project - Presentation                | 2                          | Khoa Nguyen        |
| 5/10/22              |             | Assignment Graded           | Final Project - Submission  | 10                         | Khoa Nguyen        |
|                      |             |                             | <b>TOTAL CONTACT HOURS =</b>                                      | 28.5                       |                    |

## Appendix C: Final project rubric

| 100 possible points                                   | Exemplary (10 points)  | Accomplished (8 points)  | Needs Improvement (5 points)  |
|---|--|--|---|
| <b>Specific Aims/Objectives (x3)</b><br>---/30 points | <ul style="list-style-type: none"> <li>Clearly and concisely describe the objective(s) or aim(s) of the proposal</li> </ul>  | <ul style="list-style-type: none"> <li>Vaguely describe the proposal's objective(s) or aim(s).</li> <li>Used more than three sentences to describe the objective(s)</li> </ul>   | <ul style="list-style-type: none"> <li>Objectives or aims are not described in the proposal</li> </ul>  |
| <b>Background (x3)</b><br>--/30 points                | <ul style="list-style-type: none"> <li>The proposal thoroughly summarized background information from the literature.</li> <li>The <b>systematic review</b> clearly described the most relevant studies on the topic of interest.</li> <li>The proposal states the gap that needs to be addressed and how the proposal's objective(s) can help fill the gap.</li> </ul>  | <ul style="list-style-type: none"> <li>Background section lack information on current literature.</li> <li>The systematic review is not up to date.</li> <li>The proposal does not clearly state the gap in the literature or how this proposal can benefit healthcare.</li> </ul> | <ul style="list-style-type: none"> <li>Illogical background information.</li> <li>Does not describe the systematic review</li> <li>Does not describe a gap in the literature</li> </ul> |
| <b>Methods (x3)</b><br>---/30 points                  | <ul style="list-style-type: none"> <li>Scientifically and logically described how the proposal can be conducted in detail.</li> <li>Students are <b>not expected to use common frameworks or validated techniques from the ground literature.</b> However, proposed methods should be measurable and logically address the objective(s.)</li> <li>All elements of the methods section are presented</li> </ul> | <ul style="list-style-type: none"> <li>Most elements of the methods are presented.</li> <li>Most of the information is relevant and organized correctly.</li> </ul>  | <ul style="list-style-type: none"> <li>The paper does not provide a scientifically sound and reasonable method to address the objective(s) of the project.</li> </ul>                   |
| <b>References (x1)</b><br>---/10 points               | <ul style="list-style-type: none"> <li>Articles are clearly cited throughout the proposal.</li> <li>Demonstrate a thorough review of the literature (relevant number of references).</li> <li>References are listed at the end in a consistent format.</li> <li>Students can choose one citation format of their own but must stay consistent with that format.</li> </ul>                                     | <ul style="list-style-type: none"> <li>Provided references but not thoroughly.</li> <li>Inconsistent format for citation</li> <li>The information cited is outdated.</li> </ul>  | <ul style="list-style-type: none"> <li>Do not provide adequate references and citations of the literature.</li> <li>Does not meet the format requirement</li> </ul>                     |

## Appendix D. Final presentation rubric

| 100 points total   | <b>Exemplary<br/>(10 points)</b>   | <b>Accomplished<br/>(8 points)</b>  | <b>Needs Improvement<br/>(3 points)</b>   |
|--|--|---|---|
| <b>Organization<br/>(x2.5)</b><br>Pts: ---/25              | Information presented in a logical, interesting sequence is accurate and comprehensive   | Information in a logical sequence, is accurate and comprehensive, though minor errors may be present  | Cannot understand presentation; content is not accurate and not comprehensive   |
| <b>Presenter Knowledge<br/>(x2.5)</b><br>Pts: ---/25       | Demonstrates full knowledge by answering all questions with explanations and elaborations  | At ease with expected answers to questions but does not elaborate   | Does not have a grasp of the information<br>Cannot answer questions about subject   |
| <b>Visual Aid<br/>(x2.5)</b><br>Pts: ---/25                | Sufficient but not overwhelming detail. Adds to presentation meaningfully.   | Relate to text and presentation, lacks sufficient detail or overwhelming amount of detail.  | Visual aid distracts from presentation,   |
| <b>Professional Presentation<br/>(x2.5)</b><br>Pts: ---/25 | Maintains eye contact and pronounces/spells all terms precisely. Speech is clear with appropriate volume. Meets time requirements. | Maintains eye contact most of the time and pronounces/spells most words correctly. Speech is clear, but volume is too quiet/loud at times. Meets time requirements. | Reads with no eye contact and incorrectly pronounces/spells terms. Speech is unclear and volume is not appropriate most of the time. Does not meet time requirements. |