

Clinical Information Systems – INFO B435

Department of BioHealth Informatics
Indiana University School of Informatics and Computing, Indianapolis

COURSE DESCRIPTION

This online course is an undergraduate version of the course Clinical Information Systems. The course provides an introduction to clinical information systems. Clinical information systems include: human computer interface and systems design; healthcare decision support and clinical guidelines; system selection; organizational issues in system integration; project management for information technology change; system evaluation; regulatory policies; impact of the Internet; economic impacts of e-health; distributed healthcare information technologies and future trends.

Required Text(s):

Shortliffe, E. H. and Cimino J. J (eds) (2014). Biomedical Informatics: Computer Applications in HealthCare and Biomedicine. (4th Ed.)

e-book

DOI 10.1007/978-1-4471-4474-8_4, © Springer-Verlag London 20134

Language: English

ISBN 978-1-4471-4474-8

Additional readings as suggested by the instructor.

Additional Texts: (optional)

Rudi Van De Velde, et al (2003) Clinical Information Systems: A Component-Based Approach

Edition: 1

Publisher: Springer

ISBN: 0387955380

Enrico Coiera (2003). Guide to Health Informatics

Edition: 2

Publisher: Oxford University Press

ISBN: 0340764252

Student Learning Outcomes

Upon successful completion of the course, students will	PUL
1. Understand the basic principles of the human body from cell to organism	3
2. Understand various organ system levels	3
3. Solve medical problems using information from real-world cases	2
4. Explain the flow of patient information in healthcare routines	3
5. Communicate with essential healthcare vocabulary	1A
6. Explain what information clinicians collect and why	1A, 2, 3
7. Describe clinical decision support services to health professionals	1A, 2, 3, 6
8. Explain various issues in the healthcare industry	1A, 2, 3

Principles of Undergraduate Learning (PUL):

- | | |
|---|-------------------|
| 1A. Core communication: written, oral and visual skills | Some emphasis |
| 1B. Core communication: quantitative skills | |
| 1C. Core communication: information resources skills | |
| 2. Critical thinking | Moderate emphasis |
| 3. Integration and application of knowledge | Major emphasis |
| 4. Intellectual depth, breadth, and adaptiveness | |
| 5. Understanding society and culture | |
| 6. Values and ethics | |

Evaluation and Assessment

Detailed instructions regarding each assignment will be provided as the course progresses.

Attention to the instructions, clarity of expression and presentation, and evidence of critical thinking are important for all assignments.

Grading will be based on a 1000-point scale distributed as follow:

Assignment	Number	Pts Ea.	Total Pts.	Total %
D Contribution to online threaded discussions: Best 9 of 13	9	40	360	36.0%
E Midterm Exam (Module 9 Evaluation Paper)	1	200	200	20.0%
M OpenMRS Activities	2	50	100	10.0%
P Final Project	1	300	300	30.0%
Q Quizzes & Surveys	Varies	Varies	40	4.0%
Total			1000	100.0%

The passing grade for the undergraduate class is a C.

If you earn a B- and pass a written test you can get waived from the graduate version if you decide to pursue the master degree in Health Informatics.

Grading Scale

The conversion table from numerical format to letter grades is followed:

Letter	Low	High	Description
A	930.0+		Excellent achievement; above and beyond expectations
A-	900.0	929.9	Very good work; meets all expectations
B+	870.0	899.9	Good work
B	830.0	869.9	Highly satisfactory work
B-	800.0	829.9	Satisfactory work
C+	770.0	799.9	Marginal work
C	730.0	769.9	Very marginal work
C-	700.0	729.9	Unacceptable work (Course must be repeated for HIM/INFO credit)
D+	670.0	699.9	Unacceptable work (Course must be repeated for HIM/INFO credit)
D	630.0	669.9	Unacceptable work (Course must be repeated for HIM/INFO credit)
D-	600.0	629.9	Unacceptable work (Course must be repeated for HIM/INFO credit)
F	< 600.0		Unacceptable work (Course must be repeated for any credit)

The above schedule and procedures are subject to change in the event of extenuating circumstances and at the discretion of the instructor. Attendance is required from the first class of the semester, failing to do so will be reported as an unauthorized absence and graded zero for class participation; no make-up assignments are allowed for unauthorized absences.

(D) Discussion Assignments: Assignments in the form of discussions will be posted each week on Canvas and are expected to be turned in by the assigned deadline. Detailed posting and due dates are available online in the course schedule. Assignments are short discussions written individually by students about a given problem or case based on each week's topic. Assignments should be submitted through the Canvas website.

(E) Exams (Midterm): The midterm exam (Module 9, EMR Evaluation Design) will be a take-home extended paper and will be in the 9th week of the course. Students will be allotted a certain time (weeks) limit for finished and submitted the paper.

In this course, there is no requirement to memorize the content of the presented material in the class; however, understanding the content and the logical relations among topics is crucial. Assignments and exams are conducted in an out-of-class fashion. You are permitted to use any legitimate sources of knowledge such as the web, books, slides, and published papers to find the answers; however, plagiarism is strictly prohibited.

On individual assignments, group work (e.g., answering the questions while working in a group), personal assistance (e.g., asking a classmate to help you finding an answer), and sharing answers (e.g., emailing the answers to the class) by any means are not permitted. *However, interaction with classmates online after you have done your part of the assignment (your original post) is allowed and highly recommended.* Most assignments have "no right or wrong" answers, so it will be obvious if cheating has occurred.

(P) Project: The project will be a group effort in teams of 3-4 and will result in original work that significantly impacts the world of health information. Project options vary significantly by course term offering and will be announced within the first 6 weeks of class.

(M) OpenMRS Assignments: Students will use an open-source EMR system, OpenMRS, to complete two activities in the retrieval and entry of patient data.

(Q) Quizzes & Surveys: One academic quiz (regarding the syllabus) and 1-2 surveys will be given. Surveys receive full credit upon completion.

Grading Principles & Policies

Evaluation Forms: Students should review all grading forms that will be used by the instructor to grade projects, presentations, papers, and other assignments.

If students want to see their grades at any time during the semester, they should contact the instructor by email or attend the office hours

Score: Criteria to Evaluate Threaded Discussions

40	<ul style="list-style-type: none"> • Exceptional quality (not quantity) • Evident that individual has completed all reading assignments • Demonstrates applied level of understanding through personal reflections • Answer is well-developed and logically reasoned • Provides original insights or responses; extends of others • Supports and leads others in discussion; respects other and their ideas
30	<ul style="list-style-type: none"> • Superior quality (not quantity) • Evident that individual has completed all reading assignments • Demonstrates applied level of understanding through personal reflections • Answer is provided; logic may not be clear • Provides original insights or responses • Makes connections to what others say; respects others and their ideas
20	<ul style="list-style-type: none"> • Satisfactory quality and quantity • Evident that individual has completed all reading assignments • Primarily consists of summary or paraphrasing of readings • Answer is not fully developed; logic is not clear • Contribution is primarily a response to others; minimal originality • Is respectful of others and their ideas
10	<ul style="list-style-type: none"> • Does not meet expectations • Not clear that individual has completed reading assignments • Only consists of summary or paraphrasing of readings • Minimal effort put into answer • Is not respectful of others and their ideas
0	<ul style="list-style-type: none"> • Assignment not completed

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance:

A basic requirement of this course is that you will participate in all class meetings, whether online or face-to-face, and conscientiously complete all required course activities and assignments. Class attendance is required for classroom-based courses. It entails being present and attentive for the entire class period. Attendance shall be taken in every class. If you do not sign the attendance sheet while in class, you shall be marked absent. Signing the attendance sheet for another student is prohibited. The instructor is required to submit to the Registrar a record of student attendance, and action shall be taken if the record conveys a trend of absenteeism.

Only the following are acceptable excuses for absences: death in the immediate family (e.g. mother, father, spouse, child, or sibling), hospitalization or serious illness; jury duty; court ordered summons; religious holiday; university/school coordinated athletic or scholastic activities; an unanticipated event that would cause attendance to result in substantial hardship to one's self or immediate family. Absences must be explained with the submission of appropriate documentation to the satisfaction of the instructor, who will decide whether missed work may be made up. Absences that do not satisfy the above criteria are considered unexcused. To protect your privacy, doctor's excuses should exclude the nature of the condition and focus instead on how the condition impacts your attendance and academic performance.

Missing class reduces your grade through the following grade reduction policy: You are allowed two excused or unexcused absences. Each additional absence, unless excused, results in a 5% reduction in your final course grade. More than four absences result in an F in the course. Missing class may also reduce your grade by eliminating opportunities for class participation. For all absences, the student is responsible for all covered materials and assignments.

Incomplete:

The instructor may assign an Incomplete (I) grade only if at least 75% of the required coursework has been completed at passing quality and holding you to previously established time limits would result in unjust hardship to you. All unfinished work must be completed by the date set by the instructor. Left unchanged, an Incomplete automatically becomes an F after one year.

<http://registrar.iupui.edu/incomp.html>

Deliverables:

You are responsible for completing each deliverable (e.g., assignment, quiz) by its deadline and submitting it by the specified method. Deadlines are outlined in the syllabus or in supplementary documents accessible through the learning management system (e.g., Canvas). Should you miss a class, you are still responsible for completing the deliverable and for finding out what was covered in class, including any new or modified deliverable. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

CODE OF CONDUCT

All students should aspire to the highest standards of academic integrity. Using another student's work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code > Responsibilities > Academic Misconduct* at <http://www.indiana.edu/~code/>. All students must also successfully complete the Indiana University Department of Education "How to Recognize Plagiarism" Tutorial and Test. <https://www.indiana.edu/~istd> You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else's words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com. <http://www.ulib.iupui.edu/libinfo/turnitin>

Academic Misconduct:

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
 - a. A student must not use external assistance on any "in-class" or "take-home" examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
 - b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorization from the instructor to whom the work is being submitted.
 - c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
 - d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student's individual work.
 - e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
 - f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
 - g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.
 - h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.
2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
3. **Plagiarism:** Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral

use must be fully acknowledged, unless the information is common knowledge. What is considered “common knowledge” may differ from course to course.

- a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
 - b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
 1. directly quoting another person’s actual words, whether oral or written;
 2. using another person’s ideas, opinions, or theories;
 3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
 4. borrowing facts, statistics, or illustrative material; or
 5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment
4. **Interference:** A student must not steal, change, destroy, or impede another student’s work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student’s grade or the evaluation of academic performance. Impeding another student’s work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.
5. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.
6. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

OTHER POLICIES

1. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.
2. **IUPUI course policies:** A number of campus policies governing IUPUI courses may be found at the following link: http://registrar.iupui.edu/course_policies.html
3. **Classroom civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, group work, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones engagement in private conversations and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, surfing the Internet, and posting to Facebook or Twitter during class are generally not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities. Students should check with the instructor about permissible devices in class. IUPUI nurtures and promotes “a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued” (IUPUI Strategic Initiative 9). IUPUI prohibits “discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or [veteran] status” (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.

4. **Bringing children to class:** To ensure an effective learning environment, children are not permitted to attend class with their parents, guardians, or childcare providers.
5. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily for pertinent information. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.
6. **Disabilities Policy:** In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of accommodations needed for the course. Students requiring accommodations because of a disability must register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: aes@iupui.edu, Tel. 317 274-3241). Visit <http://aes.iupui.edu> for more information.
7. **Administrative Withdrawal:** A basic requirement of this course is that students participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, it is the student's responsibility to inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and a student who has been administratively withdrawn from a course is ineligible for a tuition refund. Contact the instructor with questions concerning administrative withdrawal.
8. **Emergency Preparedness:** Safety on campus is everyone's responsibility. Know what to do in an emergency so that you can protect yourself and others. For specific information, visit the emergency management website. <http://protect.iu.edu/emergency>

MISSION STATEMENT

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI's mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University's Strategic Directions Charter.

STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.