



LUDDY SCHOOL OF
INFORMATICS, COMPUTING,
AND ENGINEERING

INDIANA UNIVERSITY

COURSE DESCRIPTION

Fall 2025

CSCI-P 465 – Software Engineering I

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|-----------------------------|--|
| Class Number: | 7709,7716,14630 (Morning Class) 11597, 11598, 14631 (Evening Class) |
| Term: | Fall 2025 – Aug 25 - Dec 19 |
| Meeting Time: | Monday & Wednesdays 11:10AM-12:25PM (Morning Class) 5:30PM - 6:45PM (Evening Class) |
| Meeting Location: | IF (Luddy Hall) 1106 BH (Ballantine Hall) 003 |
| Course Material Instructor: | Accessible through Canvas (https://canvas.iu.edu) Kurt Seiffert, Lecturer of CS |
| Office Location: | IF 2016 (Luddy Hall) |
| Email: | seiffert@iu.edu |
| Office Hours: | See Canvas Office Hours |
| Office Hours Zoom Link | https://iu.zoom.us/my/seiffert (by appointment only) |

Course Description

3 Credit Hours: This course focuses on the operational details of managing a software engineering project. We will cover the topics of project configuration and management, continuous integration and continuous deployment techniques, configuration management, deployment and packaging, containerization and VM management, application security, software design and architecture. The course will perform reverse engineering of existing projects, application porting, and distributed application deployment.

New to this semester is a focus on AI tools and impact on software engineering.

Pre-requisite Course(s): NONE however C 291 or knowledge of C/C++ is recommended

Course Format: In classroom and in person

This is an in-person class and lectures will be delivered in the classroom. Video recordings may not be available later.

Every week there will be in-class exercises that will need to be submitted at the end of class.

Learning Objectives

Students are expected to demonstrate:

1. Understand how to collaborate and contribute to a shared codebase for a software engineering project. (Configuration Management)
2. How to define and instrument software for operational reporting and support. (Monitoring)
3. How to effectively select, configure, and use containers and virtual machines for

- development, testing, and deployment. (Virtualization and Containerization)
4. Understand the essential elements of good test writing and how to build sustainable testing infrastructure to support quality driven development. (Testing)
 5. Understand how to orchestrate and automate code merges, code builds, software deployments, and test harnesses to support a CI/CD pipeline. (Automation, CI/CD)
 6. Understand the different types of software engineering documentation and the role of each type contributes to a quality software engineering project. (Documentation)
 7. Understand how to perform a risk based security analysis of a software engineering project and how to develop and implement mitigation techniques. (Security)
 8. How to build effective and productive teams based on the principle of accountability. (Team Building)
 9. Understand and configure data networking protocols to build, test, deploy, and monitor applications. (Data Networking)

Required Textbook and Reference Books

There is no textbook for this course. Various reading material will be assigned in the modules.

Course Work-Load Expectations

Federal regulations define a credit hour in the amount of work as 'no less than one hour of class room instruction' and 'a minimum of two hours out of class student work' per week for 15-week semester. The credit hour definition is a minimum standard and it **DOES NOT** restrict an institution from setting a higher standard that requires more student work per credit hour.

For this 3-credit hour 15-week course you should be prepared to spend a minimum of 6-9 hours per week outside of lectures.

Grading Scheme

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|--------------------|-----|---------------------------|---------------------|
| Assignments | 50% | Score | Letter Grade |
| In-class Exercises | 10% | 90–92.9, 93–96.9, 97–100 | A-, A, A+ |
| Weekly Quiz | 15% | 80–82.9, 83–86.9, 87–89.9 | B-, B, B+ |
| Exams (2) | 25% | 70–72.9, 73–76.9, 77–79.9 | C-, C, C+ |
| | | 60–62.9, 63–66.9, 67–69.9 | D-, D, D+ |
| | | 0 – 59.9 | F |

Oral Component to Assignments and Exams

All assignments except for in-class exercises, will have a oral component I will refer to as Team Interviews. Team members will have to attend the team interview in order to get full credit for assignments or exams. For assignments, the team AI will conduct a Team Interview for each assignment. Teams will coordinate with the AI to arrange time and venue. Assignment Team Interviews are distinct from Team Standup meetings which team AI's will periodically attend.

For exams, I will be making 30 minute blocks of time available week 8 for the mid-term and week 15 for the final. Teams will signup for a block of time when all team members can attend.

Teams and Collaboration

Students are assigned into teams of 5 students. (A few teams may only have 3 or 4 students.) Each team will be assigned a primary TA to help with team issues. Assignments will be one of three types.

- Individual - Work is to be completed and submitted for an individual student. (NO Team component.)
- Team Best - Each member of the team submits their own version of the assignment, but the team submits the best version for the team score which is then used for each team member.
- Team Collaboration - Each team member is required to contribute to one or more of the assignment components to receive credit for the team score on the assignment.

Collaboration Coefficient and Canvas Scores

A team members assignment score in Canvas will be the team score multiplied by the student's collaboration coefficient for the assignment. If the student contributes appropriately for a Team-Best or Team-Collaboration assignment, then the coefficient will be 1.0, otherwise it will be 0.5.

The coefficient can additionally be affected by a team demerit or merit award.

Team Merits and Demerits

for each assignment, teams can reward or penalize an individual team member. A merit or demerit must be supported by the majority of the team members and is subject to review and approval by the team TA and/or the instructor. A merit award will increase a single team member's collaboration coefficient by 0.2 and conversely a demerit decreases the member's coefficient by 0.2.

If a team wishes to award a merit or demerit to a team member for an assignment, the following process is followed:

1. A team member must write a merit/demerit proposal which includes:
 - A. Specific examples to justify the action.
 - B. If a demerit, at least two suggestions on how the student can improve for the future.
 - C. Ensure the examples can be verified with team notes, git commits, edit/comments in collaborative documents, etc.
2. If the proposal is for demerit, the student in question shall be allowed to write a response to the proposal that is to be read by the other team members.
3. After any response has been reviewed, the team records a vote on the proposal. If the proposal fails to get a vote of the majority of members, then the matter should be considered closed for the duration of the course.
4. Successful proposals are forwarded to the Team TA for review and approval. If the TA approves the proposal, the TA will adjust the student's score for that assignment

accordingly. If the TA rejects the proposal, it will be accompanied with a justification and alternate course of action for the team. In either case all the information will be shared with the instructor.

5. If the student awarded the merit/demerit wishes to appeal the TA approval, the student should contact the instructor for a review and final disposition of the issue.

Minimum Technical Requirements for Course

You will need the following in order to participate in this course:

- Computer with microphone and speakers/headphones
- Reliable internet connection and web browser

Late Policy and Makeup Work

Work submitted past the due date will not be able to achieve a score greater than 85% of value of the assignment. For team assignments, this penalty will be assessed to the team score and before the application of the collaboration coefficient. **A late team assignment affects ALL members of the team and not just the member responsible for submitting the assignment to Canvas.**

Office Hours / Email Communication with the Instructor / Customers / TA's

The contact information, links to zoom meeting rooms and the schedule of office hours for customers and TAs can be found on Canvas. You may also communicate with your instructor, customers & TAs by e-mail. Allow 24 hours for a reply. The response time during the weekend may be longer than 24 hours.

Individual Work, Research and Plagiarism

This course is team oriented and much of the work will be collaborative. Students are encouraged to share resources, thoughts, and techniques between team members **only**. Individual assignments however are to be the product of only each individual student. Individual assignments will be clearly marked as such.

Student Rights

Any student who believes another person in a class is threatening the safety of the class by not wearing a mask or observing physical distancing requirements may leave the class without consequence.

Attendance

No attendance will be taken in the class. However, each there will be in-class exercises to perform and submit material. Some in-class exercises will be team based and others will be individual. In-class exercises must be submitted by the end of class and cannot be made up afterwards. Absent team members will receive a 0.5 collaboration coefficient for any in-class team exercise.

Summary Suspension Policy

A student may be summarily suspended from the university and summarily excluded from university property and programs by the Provost or designee of a university campus. The Provost or designee may act summarily without following the hearing procedures established by this section if the officer is satisfied that the student's continued presence on the campus constitutes a serious threat of harm to the student or to any other person on the campus or to the property of the university or property of other persons on the university campus.

Other University Policies

You should also review the following university policies:

- Disability Services for Students (DSS): For accommodations, visit: <https://studentaffairs.indiana.edu/disability-services-students/>
- Code of Student Rights, Responsibilities, and Conduct: visit <https://studentcode.iu.edu/responsibilities/index.html>
- Title IX Sexual Misconduct related info can be found at <https://stopsexualviolence.iu.edu/>
- Counseling and Psychological Services: Visit: <http://healthcenter.indiana.edu/counseling/index.shtml>

Technical Support

You may also receive support from:

- [UITS](#) (human support) and [IUKB](#) (guides)
- [IUWare](#) (to download free software)

***Disclaimer:** The instructor reserves the right to make any changes to the syllabus any time during the term.*

Class Schedule and Weekly outline

| | Topics / Lectures | Assignment |
|------------------------------|---|---|
| 1 Week of 08/25 | Course Overview Angband Game | <ul style="list-style-type: none">• Define your Team• Play Angband to Level 10 |
| 2 Week of 09/1 | Building Angband | <ul style="list-style-type: none">• Make file exercise |
| 3 Week of 09/08 | Architecture and Design | <ul style="list-style-type: none">• UML Diagrams |
| 4 Week of 09/15 | Grey-field Development (Modifying Programs) | <ul style="list-style-type: none">• Impact Analysis |

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|----------------------------------|---------------------------------|--|
| 5 Week of 09/22 | Virtualization | <ul style="list-style-type: none"> Configuring Angband development VM |
| 6 Week of 09/29 | Data Management | <ul style="list-style-type: none"> Monster File Editor |
| 7 Week of 10/06 | Containerization | Containerize Monster File Editor |
| 8 Week of 10/13 | Mid-term | |
| 9 Week of 10/20 | Data Networks Introduction | nmap exercise |
| 10 Week of 10/27 | Web Application Architecture | Configure RMS Deployment |
| 11 Week of 11/03 | Application Security | RMS Security Plan |
| 12 Week of 11/10 | Automated Deployment | Automate RMS Deployment |
| 13 Week of 11/17 | CI/CD | TBD |
| Fall Break 11/23-11/28 | | |
| 14 Week of 12/1 | Monitoring and Operations | Implement RMS Monitoring |
| 15 Week of 12/10 | TBD | TBD |
| 16 Week of 12/18 | Finals Week - Final Exam | |

Note: This course outline was last updated on 8/24/2025 and will be updated on weekly basis.