



**School of Computer Science and Information Systems**  
**44-642-01 Application Design: Patterns and Frameworks**  
**Spring 2026**  
**Class Time: T Th 12:30PM -01:50PM. CH 3600**

**Instructor:** Dr. Aziz Fellah

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**Office hours:** MWF: 10:00 AM-11:30 AM; M: 3:30 PM-5:00 PM; W: 3:30 PM-4:30 PM

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**Graduate Assistant:** Bala Murali Manikanta Yalla <[S573066@nwmissouri.edu](mailto:S573066@nwmissouri.edu)>

**Prerequisites:** Students must finish 44542 courses with a grade of B or better.

**Course description:** Provides fast-paced coverage of data structures in Java (Java Collection Framework). Students will gain extensive problem solving and programming experience in developing applications using various design patterns and frameworks (e.g., Spring framework). Design principles of the user interfaces and user experience design.

**Textbook and supplementary materials:** No textbook is required; all selected instructional materials and resources that meet the needs of students will be posted on the course website.

**Software:** Different programming and non-programming software will be introduced at appropriate time.

**Outcomes:**

Student learning outcomes	Assessment methods
1. Learn current object-oriented programming techniques, skills, and tools to create an object-oriented application design.	Assignments, exams, quizzes, in-class practices, class participation
2. Get familiar with selected design patterns and frameworks.	
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.	

In addition, after this course students should be able to

- Apply data structures, including use and implementation of arrays, lists, stacks, queues, maps, trees, and heaps.
- Develop spring applications using best practices such as GitHub and Test-Driven Development.
- Use Build tools (e.g., Maven or Griddle).
- Design and build web applications using Spring MVC.
- Implement different user interface applications using design principles

**Note:** Refer to *Syllabus Addendum* for additional information.

**Disclaimer:** Course schedule is subject to change, and you will be responsible for abiding by any such changes. Your instructor will notify you of any changes.

**Instructional methods:**

- Lectures, practical demonstrations, in-class practices, and non-programming and programming assignments.
- Instructional methods include lectures, practical demonstrations, classroom practices, team/ individual projects, and interactive questions and answer sessions.
- Students are expected to spend at least 2 hours outside of class for each hour in class

**Graded Course Assessments:**

Category	Percentage	Dates are tentative and subject to change
Exam#1	14	Th. 19 <sup>th</sup> of February
Exam#2	14	Th. 2 <sup>nd</sup> of April
Final Exam	15	28 <sup>th</sup> of April (12:20PM to 2:20PM) ( <a href="https://www.nwmissouri.edu/registrar/finals.htm">https://www.nwmissouri.edu/registrar/finals.htm</a> )
Assignments	25	
In-class practices	8	
Project	8	
4 to 5 Quizzes	12	Will be announced.
Attendance + participation***	4	
Total Points	100	

\*\*\*: Used for scaling up the final grade if there is a possibility and the student is very close to a higher grade. The final exam schedule is published on-line at: <http://www.nwmissouri.edu/registrar/finals.htm>. All exams are closed book, closed notes, unless explicitly noted in writing by the instructor, no calculators, cell phones, or other electronic devices can be used during exams or quizzes unless explicitly allowed by the instructor.

**Grading scale:**

Percent Range	Grade
90-100%	A
>= 80% and < 90%	B
>= 70% and < 80%	C
>= 60% and < 70%	D
below 60%	F

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The primary factor in determining your grade is the quality of your work. Other factors will, however, negatively influence your grade, for example including but not limited to:

- Failure to submit required work and assignments on time, unless granted an extension.
- Unexcused and excessive absences.

**Course outline/major topics studied:**

Week	Tentative and expected topics (subject to change)
1	Course Introduction, JCF, In-Class Demo
2	Stack, Queue, List (Array List, Linked List and their performance), Hashing, Sets, In-Class Demo
3	Maps, Trees (binary trees, traversals, balanced tree), In-Class Demo
4	Priority Queues, Threads, In-Class Demo
5	Threads, In-Class Demo
6	Regular expressions, Build tools, In-Class Demo
7	Recursion, Design patterns and frameworks: Principles and Modeling, In-Class Demo
8	Spring Break
9	Design patterns and frameworks: Principles and Modeling, In-Class Demo
10	Design patterns, Singleton, Factory, In-Class Demo
11	Dependency injection, inverse of control, In-Class Demo
12	Spring Framework, In-Class Demo
13	Spring Framework, In-Class Demo
14	Latest trends in patterns and frameworks, In-Class Demo
15	Latest trends in patterns and frameworks, In-Class Demo
16	Final week exams

**Academic Calendar:** <http://www.nwmissouri.edu/academics/calendar.htm>

**Final Exam Schedule:** <http://www.nwmissouri.edu/registrar/finals.htm>

**Attendance:** Attendance is very important in successfully completing this course as students will have many in-class activities. It is important for you to attend classes. Information given during class meetings is vital to earning a good grade. You are responsible for all material presented in whether you are present or not. It is the responsibility of the student to promptly notify the instructor when unable to attend. Students are expected to be on time for each class. Late arrivals will be counted as absences. Attendance and punctuality are basic requirements for an effective in-class discussion and practices. If you cannot attend a class, it is a courtesy to inform your instructor in advance if possible. It is the responsibility of the student to promptly notify the instructor when unable to attend class. If a student exceeds 6 absences, a letter grade will be automatically deducted from their final course grade. Please refer to the university policy on attendance at <https://www.nwmissouri.edu/policies/academics/Attendance.pdf>

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**Final exams:** If an emergency occurs that prevents the administration of a course scheduled final examination, the final course grades will be calculated based on the work in the course completed to that point in time and the faculty member's considered judgment. Final exams will not be rescheduled, and a grade of "I" will not be given because of an institutional cancellation of a final examination.

<https://www.nwmissouri.edu/policies/academics/Adding-Dropping-Withdrawals.pdf>

**Administrative drop:** An instructor may request the Office of the Registrar delete a student from a course roster if the student has not met the prerequisite for the course as stated in the catalog, or because of non-attendance in the course, or/and as a result not returning/doing the coursework.

**Academic Administrative Withdrawal:** When it is in the best interest of Northwest Missouri State University for a student to withdraw, a student will be given a W, put on administrative hold, and given notice that they are about to be withdrawn. This action will result in removal of all credits associated with courses that have yet to be completed in the semester in question and the student will be administratively withdrawn from the University. An Administrative Withdrawal does not affect the student's grade point average. Please refer to Northwest Missouri State University's Academic Administrative Withdrawal Policy.

**University communications:** Students are expected to use their Northwest student email account for any electronic correspondence within the university. Students are also strongly advised to check their email and CatPAWS accounts on a regular basis.

**Announcements, postings, and email:** Course material and announcements are communicated via the course website and your Northwest Missouri State University (Northwest) email account. It is your responsibility to check each of these sources daily. All announcements shall be announced in class as well. All courses related emails to the instructor and/or assistants must include the course name, number, and meeting time in the subject line. For security and quick response, emails that do not include an appropriate entry for the subject may not be opened and or ignored.

**Academic Integrity in School of Computer Science and Information Systems:** [NEW CSIS Academic Integrity Policy](#)

**Academic integrity policy:** The students, faculty, and staff at Northwest endeavor to sustain an environment that values honesty in academic work, that acknowledges the authorized aid provided by and intellectual contributions of others, and that enables equitable student evaluation. Please refer to Northwest Missouri State University's Academic Integrity Policy at <http://www.nwmissouri.edu/policies/academics/Academic-Integrity.pdf>

#### Citation Requirements

- Cite all Sources. You must provide proper citation for any content including text, images, videos, and code that you did not personally develop.
- Do not copy and paste content for any submissions.
- Failing to acknowledge assistance including internet photos, clipart, slide content, course files, shared solutions, etc. can be expected to result in a 0 on the assignment, a one-half letter grade reduction, a 0 in the course, and/or a failing the course with an academic integrity violation.

**Assignments and late submission policy:** Assignments will be posted at appropriate times during the semester. Assignment's submission instructions and guidelines will be stated in each homework. Assignments are designed to illustrate concepts covered in class. Cooperating with other students, on academic course work, only where specifically authorized. Also, note that all assignments are to be done individually unless specified otherwise. In addition, you should represent your own work honestly and accurately. You may discuss with your classmates about

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an individual assignment, but you must do your own work in completing the assignment. Each assigned and graded activity will have a due date posted and is expected to be completed by the due date. Failure to follow these guidelines will be subject to the penalties described in the academic integrity/honesty paragraph.

For late work, exceptions can always be made for medical and compassionate reasons arranged in advance with the instructor. No late submissions will be accepted during finals week. The course concludes at the end of our final time. The course concludes at the end of our final time.

**Exam dates & policies:** Dates for all exams are on the syllabus, but they are subject to change. In case you miss an exam for a valid reason (e.g., being sick, family emergencies, university-sponsored trips), it is your responsibility to notify the instructor prior to the exam. However, I reserve the right to ask for a proof. Announced quizzes, will be given at appropriate times. There will be no make-up for quizzes.

**Digital devices & PC in classroom:** There will be no aids during exams, including calculators, pagers, text messages, and cellphones, etc. Make sure your cellphone does during exams and lectures. Distractive activities such read/write e-mails, chatting, and playing games during lectures are not allowed. This is very disruptive to me and the other students in the class, including your self-distraction from learning the material. Students are supposed to use such a technology, if needed, to improve and enhance their education but not to replace the instructor.

**Grade appeals:** You can contact your GA/TA for any questions or remarks about your work, which will be accepted up to one week after the marks have been released. However, students may discuss/view their graded work (exams, quizzes, assignment, etc.) during my office hours and within one week period. Any academic issue that has not been resolved by your GA/TA should be forwarded to me, either verbally or by e-mail.

**Learning or Living Accommodations Request Process:** Northwest Missouri State University complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 [ADA] and the ADA Amendments Act of 2008 [ADAAA]. If a student has a documented disability that qualifies under the ADA/ADAAA and requests accommodations, they should review the Accessibility and Accommodations webpage at

<https://www.nwmissouri.edu/titleixequity/accessibility/index.htm> for guidance, including the accommodations application and supporting documentation requirements. Contact [ada@nwmissouri.edu](mailto:ada@nwmissouri.edu) or 660.562.1873 for further assistance. For the university policy on disability accommodation refer to <http://www.nwmissouri.edu/policies/student/Disability-Accommodation.pdf>

**Non-discrimination and anti-harassment policy:** Northwest Missouri State University is committed to maintaining an environment for all faculty, staff, students, and third parties that is free of illegal discrimination and harassment. Please refer to the Non-Discrimination and Anti-Harassment Policy at <https://www.nwmissouri.edu/TitleIXEquity/titleix/>

**Family Education Rights and Privacy Act (FERPA) policy:** Family Educational Rights and Privacy Act of 1974, as amended (commonly known as the Buckley Amendment), is a federal law which provides that colleges and universities will maintain the confidentiality of student education records. Please refer to the Family Educational Rights and Privacy Act (FERPA) Policy at <http://www.nwmissouri.edu/policies/academics/Family-Educational-Rights-and-Privacy-Act.pdf>

**Behavior and Wellness:** Northwest focuses on student success—every student, every day. The Wellness Center, 660.562.1348, offers free counseling for students coping with depression, anxiety, alcohol or drug misuse, relationships, and other emotional, social, and academic stressors. In addition, faculty, staff, and students who are concerned with student wellbeing can report their concerns, including anonymously, to the Behavioral Intervention Team, so that the student can be offered relevant support, at this link: [Concerning Behavior Reporting Form](#). If you

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are concerned about the immediate safety of a student, please call the University Police, who have specialized training in intervention, at 660.562.1254.

**A note on Artificial Intelligence (AI) Engines:** Generative AI engines, such as ChatGPT and other tools, are becoming important tools to help improve various professional experience and can help facilitate the learning process. AI However, any work written, developed, created, inspired, or co-authored by artificial intelligence (AI) is not allowed, will not be tolerated, and will be considered as academic dishonesty. This is because the use of AI deflects and divert your attention away from contributing your ideas in free and authentic ways and learning from your experiences and from each other.

**Course Evaluation:** At the end of this course, you will be encouraged to complete a course evaluation.

**Syllabus Revisions:** This syllabus is not a contract and is subject to changes to accommodate instructional and/or student needs. It is the sole responsibility of the student to maintain an updated course syllabus. However, students will be notified of any changes.

**Note:** *Refer to Syllabus Addendum for additional information.*

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