

# School of Computer Science and Information Systems

# 44642 -03/04: Application Design: Patterns and Frameworks.

# Credit hours - 3 hours

# Fall2023

**Instructor:** Dr. Ajay Bandi

**Email:** [ajay@nwmissouri.edu](mailto:ajay@nwmissouri.edu)

**Office hours:** M, W, F - 1:00 PM to 2:00 PM

Monday - 3:00 PM to 5:00 PM

Wednesday - 3:00 PM to 5:00 PM

# Office: CH 2250

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

**Textbook and supplementary materials:** No textbook is required; all the materials will be posted in Northwest Online.

**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 a framework (e.g.: Spring framework). Design principles of the user interfaces and user experience design.

# Learning Outcomes:

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| --- | --- |
| **Student learning outcomes** | **Assessment Methods** |
| 1. An ability to use current techniques, skills, and tools necessary for computing practice. | Scores on quizzes, class participation, and written exams. |
| 2. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired  needs | Scores on written exams. |

In addition, after successfully completing this course student will 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 the user interface design principles

**Instructional methods:** Instructional methods include lectures, practical demonstration, classroom practice, class projects, individual projects, and interactive question and answer sessions.

# Graded course requirements:

|  |  |  |
| --- | --- | --- |
| **Category** | **Points** | **Percentages** |
| Exam 1 | 100 | 18% |
| Exam 2 | 100 | 18% |
| Final exam | 100 | 18% |
| Project | 100 | 18% |
| Assignments | 100 | 18% |
| Quizzes | 50 | 9% |
| Total | 550 | 100% |

**Grading scale:**

|  |  |
| --- | --- |
| **Graduate Credit (44-642)** | |
| **Percent Range** | **Grade** |
| 90-100% | A |
| >= 80% and < 90% | B |
| >= 70% and < 80% | C |
| >= 60% and < 70% | D |
| below 60% | F |

**Tentative Course outline/major topics studied:**

| Week | Topics |
| --- | --- |
| 1 | Syllabus |
| 2 | Review of 44542 |
| 3 | JCF |
| 4 | Stack, Queue, List (Array List, Linked List, and their performance), Hashing, Sets |
| 5 | Maps, Trees (binary trees, traversals, balanced tree) |
| 6 | Priority Queues  Threads |
| 7 | Threads |
| 8 | Design patterns  Singleton, Factory |
| 9 | Regex  Build tools |
| 10 | Dependency Injection, Inverse of control |
| 11 | Spring framework |
| 12 | Spring framework |
| 13 | Spring framework |
| 14 | Thanksgiving Break |
| 15 | Spring framework |
| 16 | Final Exam |

***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.*

**Academic Calendar**: [*http://www.nwmissouri.edu/academics/calendar.htm*](http://www.nwmissouri.edu/academics/calendar.htm)

**Final Exam Schedule**: [*http://www.nwmissouri.edu/registrar/finals.htm*](http://www.nwmissouri.edu/registrar/finals.htm)

**Attendance:** This course will have many in-class activities, so attendance is strongly suggested. Some in-class exercises may have points associated with them and may not be announced in advance. A student who misses such an exercise due to an unexcused absence will not be allowed to make it up and will receive a zero. For an absence to be excused, written documentation must be provided and approved by the instructor abided by the MS-ACS attendance procedure. Excused absences include attendance at a university-sponsored event (documented with an excuse signed by the university sponsor prior to the event) or by circumstances considered adequately extenuating by the course instructor. It is the responsibility of the student to promptly notify his or her instructor when unable to attend class. Please refer to the university policy on attendance at <https://www.nwmissouri.edu/policies/academics/Attendance.pdf>

**Late Submission Policy for assignments:** Each assigned, graded activity will have a due date posted and are expected to be completed by the due date. All the submissions must be submitted through Northwest Online. Any submission up to 24 hours after the due date will be considered as a late submission. The score for late submissions will have 10% of the maximum score deducted from the actual points.

**Quizzes and In-class Activities:** There may sometimes be short quizzes or in class activities in class, usually worth five points or less. These quizzes or activities will not always be announced in advance. They will usually be given at any point of the class time. If you arrive late or miss a quiz or an activity due to an unexcused absence, you will receive a grade of zero on the quiz or activity. Different sections may have quizzes or activities on different days.

**Arriving late for class:** Students are expected to be on time for each class period.

**Exam policies:** Dates for all exams will appear on the course website under the weekly modules. If you must miss an exam, it is your responsibility to notify the instructor prior to the exam.

Make-ups for written exams will be given only for valid and verifiable reasons. Valid reasons include illness, family emergencies, and university-sponsored trips. Written documentation with suitable verification must be supplied before a make-up will be allowed.

There will be no make-ups for lab exams. If you miss a lab exam for a valid reason, the lab final (suitably pro-rated) will be used as the make-up.

Lab exams are submitted via Canvas. It is the student's responsibility to ensure that the correct files are dropped in the correct assignment. If no submission is found in the drop box, the student receives a grade of zero on the lab exam.

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.

**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. This final exam policy does not apply to online courses. The final exam time for this course can be found at <https://www.nwmissouri.edu/registrar/finals.htm>

**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.

**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 at:

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

**University communications:** Any course related announcements will be communicated via the **Announcements** page on the course website in Northwest Online or your Northwest e-mail account. 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 on a regular basis. E-mails must include the course number (44-695) in the subject line. For security reasons, e-mails that do not include an appropriate entry for the subject or unsigned e-mails will not be replied.

**Professionalism:** Students are expected to behave in a professional manner in their dealings with each other, the teaching assistant, and the instructor. E-mails should be politely written, use proper grammar, and follow the rules of capitalization.

**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>

**Artificial Intelligence Engines:**Generative AI engines are fast becoming important tools to help improve various personal, professional, and educational tasks. Specifically for this course, the submission of academic work created by a generative AI engine is not allowed. All submitted course work must be your own work. The goal is for you to learn and understand the course content. AI engines are tools which can help facilitate the learning process. The understanding of course content is assessed by completing the required course work. Your understanding cannot be gauged if AI generated material is used.

**Special accommodations policy:** 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 disability that qualifies under the ADA/ADAAA and requires accommodations, they should contact the Office for Equity and Accessibility for information on appropriate policies and procedures at 660.562.1639, or [pjp@nwmissouri.edu](mailto:pjp@nwmissouri.edu)/[ADA@nwmissouri.edu.](mailto:ADA@nwmissouri.edu) For the university policy on disability accommodation refer to [http://www.nwmissouri.edu/policies/student/Disability-](http://www.nwmissouri.edu/policies/student/Disability-Accommodation.pdf) [Accommodation.pdf](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 <http://www.nwmissouri.edu/diversity/titlevi.htm>

**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-](http://www.nwmissouri.edu/policies/academics/Family-Educational-Rights-and-Privacy-Act.pdf) [Act.pdf](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](https://cm.maxient.com/reportingform.php?NorthwestMOStateUniv&layout_id=5). If you are concerned about the immediate safety of a student, please call the University Police, who have specialized training in intervention, at 660.562.1254.

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