Course Syllabus

Jump to Today

IST 411: Distributed-Object Computing

Section 1

Spring 2024

Instructor: Dr. Jeff Rimland (jrimland@ist.psu.edu)

Course Info:

Meeting time: Monday, Wednesday, and Friday @ 1:25 pm - 2:15 pm

Meeting Location: E206 Westgate Building

Learning Assistants:

- Adam Watson (acw5549@psu.edu)
- Riya Thokala (rkt5297@psu.edu)

Office Hours

The Learning Assistants and I are available to meet with you in-person or via Zoom. Office hours are scheduled by appointment. Just reach out to us via email or Canvas message with a range of times that you are available. We are happy to meet with you, so please take advantage of this resource!

Course Description

This course presents the fundamental concepts of distributed-object computing, including client/server computing which is an important platform for real-world computing systems. The course focuses on design, development, and deployment of distributed systems. Students will also consider issues of managing distributed systems and the relationships between organizational processes and information-system architectures. IST 411 is an elective course for the Baccalaureate degree program in Information Sciences and Technology. Students completing the Systems Development Option may take this course to fulfill option requirements.

Prerequisites

- IST 311, completed with a grade of "C" or better

Objectives

Upon successful completion of IST 411, students will be understand the core concepts and proficiently implement code related to the following areas:

- The fundamentals of networking in Java. This includes the manner in which services are addressed on a network (IP Addresses and Ports), the key concepts for designing systems and implementing applications that are distributed across multiple computers on a network, and the Java mechanisms that provide this functionality.
- The fundamentals of the JavaScript programming language. JavaScript is the only programming language that runs natively in every web browser. It is critical for enabling real-time updates of web pages, and is now being used to develop server-side and database applications.
- Various network architectures including client-server, as well as the various types of middleware and protocols (such as HTTP) that supports these architectures.
- Model-View-Controller (MVC) architectural pattern (including its usage in simple Java applications as well as web frameworks), and the Representational State Transfer (REST) design pattern.
- Creating web services and web applications using a variety of technologies including the latest Java and JavaScript web frameworks.

Materials

All materials for this course are freely available in online form via the University Libraries. Print versions are also available for purchase via Amazon and other online retailers if this is your preference, but I recommend accessing them for free via the links below:

- Reese, R. M. (2015). **Learning Network Programming with Java (https://ebookcentral.proquest.com/lib/pensu/detail.action?docID=4191344)** ISBN 978-1785882562
- Purushothaman, J. (2015). ***RESTful Java Web Services (https://ebookcentral.proquest.com/lib/pensu/detail.action?docID=4191254)*** (2nd ed.) ISBN 978-178439637

Note that additional (free) resources will be provided over the course of the semester.

Installing software on your computer

Since this course introduces various server-side technologies, frameworks, and languages that are not typically covered in most IST/Penn State courses, you will need to have the ability to install software on a computer. If you don't have a suitable computer that can be used for these purposes, I'll arrange for a

Virtual Machine (VM) or other suitable alternative to be available to you. Please let me know ASAP if you'll need this accommodation.

If you don't already have it on your computer, I suggest installing VSCode, which I will be using for all coding demonstrations:

https://code.visualstudio.com/ (https://code.visualstudio.com/)

Grading and Assignments

This course is assignment intensive. Completing all assignments in a timely manner is a strong indicator of success in this course.

Late Policy: Assignments submitted up to 48 hours late will receive a 25% grade deduction. No late assignments will be accepted after 48 hours without prior approval from the instructor.

Submission Error Policy: Students have been occasionally known to "accidentally" submit a corrupted or incorrect file in order to buy more time to complete an assignment. Because of this, resubmissions will not be accepted after the assignment due date. After uploading a file to Canvas, make sure that you download your submission from Canvas to verify that you have uploaded the correct and uncorrupted file.

I understand that we all make mistakes and have off days. In order to accommodate this, your lowest assignment grade of the semester will be automatically dropped in Canvas. This applies to your lowest grade among all **Individual Assignments and Partner Labs**. It will not apply to activities such as quizzes or status check-ins.

If you feel that an error has occurred in the grading of an assignment or quiz, you must contact me to request a re-evaluation of your submission within 10 days of receiving your grade.

The sharing of knowledge is strongly encouraged. Working together to understand and learn during the semester is essential; however, COPYING (from the Web or peers) assignments or program code is unacceptable. This is cheating and will be addressed in accordance with the University Academic Integrity policy (see below). **The use of ChatGPT or other AI-based assistance on your assignments is strictly prohibited in accordance with University policy.** If you have any questions about this, please ask!

There will be individual and partner assignments. **All assignments must be submitted by each student unless otherwise stated in the assignment.**

Your grade in this course will be based on the following activities:

- Partner Labs
  - These activities will encourage active learning and sharing of knowledge as your work through various assigned challenges with an (optional) partner.
- Individual Assignments
  - These assignments will test your understanding of core concepts via in-depth individual challenges that will require you to demonstrate your ability to construct complete solutions to increasingly difficult problems
- Quizzes
  - Quizzes will generally occur every 3-4 weeks.
- Status check-ins
  - Some weeks will include a Status check-in for you to complete in Canvas. This is a place to leave any comments regarding what you found useful, what you struggled with, or anything else you would like me to know. Status check-ins will typically be worth 3 points, and they are the easiest points that you will earn all semester!
- Other assignments
  - This course may also include other assignment categories including work in larger groups, "participation" activities, extra credit activities, and whatever else we come up with!

Attendance

While I do not track or grade your attendance, you are strongly encouraged to attend all class sessions unless you are ill. You are responsible for any announcements, activities, or quizzes that you may miss -- so make sure to talk to a trusted student, a learning assistant, or your instructor if you miss class.

Important Note:

If you are ill and unable to complete a quiz or assignment by the specified due date, please contact me as soon as possible in order to receive an accommodation. Contact me before the assignment due date when possible.

Tentative Schedule of Topics (subject to change):

Week	Topics
1	Course Introduction Foundations of Network Programming and Java Networking Capabilities

2	Client/Server programming
3	Leveraging network connections
4	APIs and JSON in Java
5	Introducing JavaScript
6	APIs and JSON in JavaScript
7	More advanced JavaScript and API access
8	Using multiple APIs together
9	REST architecture
10	Introducing Node.js
11	More Node.js and server-side JavaScript
12	The full-stack JavaScript Application
13	Introducing Express.js and NPM
14	Full-stack JS with Express.js
15	Vue.js

The following table shows an approximate weighting of each activity on your grade:

Activity	**Valued at (% of the final grade)**

Partner Labs and Individual Assignments	75%
Quizzes	10%
Group and "Participation" activities	10%
Status check-ins	5%
Total	**100%**

The table above serves as a rough guideline only. Other graded assignments (e.g. small group projects, etc.) or modification to the number of a certain type of assignment (e.g. fewer quizzes or Labs) may result in significant variations from these grade weights.

Letter grades will be assigned to the above percentages as follows:

A: 100-93
A-: 92-90
B+ 89-86
B: 85-82
B-: 81-79
C+: 78-76
C: 75-70
D: 69-60
F: 60-0

Note that I round up on .5 or higher (e.g. 89.5 rounds up to an A-)

Please refer to the University Grading Policy for Undergraduate Courses for additional information about University grading policies.

If you are prevented from completing this course for reasons beyond your control, you have the option of requesting a deferred grade from your instructor. For more information, please see "Deferred Grades" on

the Student Policies Web Site.

Conduct

Although this happens extremely rarely, students who conduct themselves in a very disrespectful manner (e.g. excessive talking in class, rudeness to other students or the instructor, etc.) or who otherwise repeatedly distract other students from learning will be asked to leave the classroom. This type of behavior may result in University disciplinary action in accordance with the University Code of Conduct:

http://studentaffairs.psu.edu/conduct/ (http://studentaffairs.psu.edu/conduct/)

While the usage of cell phones and mobile devices is generally allowed, please be respectful and keep their usage to a minimum to avoid creating a distraction. Video recording any part of the lecture or class is prohibited in accordance with Penn State policy.

Academic Integrity

(http://www.sa.psu.edu/ja/) According to the Penn State Principles and University Code of Conduct: Academic integrity is a basic guiding principle for all academic activity at Penn State University, allowing the pursuit of scholarly activity in an open, honest, and responsible manner. In according with the University's Code of Conduct, you must not engage in or tolerate academic dishonesty. This includes, but is not limited to cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized possession of examinations, submitting work of another person, or work previously used without informing the instructor, or tampering with the academic work of other students. Any violation of academic integrity will be investigated, and where warranted, punitive action will be taken. For every incident when a penalty of any kind is assessed, a report must be filed.

Accommodating Disabilities

Americans with Disabilities Act: The School of Information Sciences and Technology welcomes persons with disabilities to all of its classes, programs, and events. If you need accommodations, or have questions about access to buildings where IST activities are held, please contact us in advance of your participation or visit. If you need assistance during a class, program, or event, please contact the member of our staff or faculty in charge. Access to IST courses should be arranged by contacting the Office of Human Resources, 332 IST Building: (814) 865-8949. Students with Disabilities: It is Penn State's policy to not discriminate against qualified students with documented disabilities in its educational programs. (You may refer to the Nondiscrimination Policy in the Student Guide to University Policies and Rules.) If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY). For further information regarding ODS,

please visit the Office for Disability Services Web site at http://equity.psu.edu/ods/ (http://equity.psu.edu/ods/) . In order to receive consideration for course accommodations, you must contact ODS and provide documentation (see documentation guidelines at http://equity.psu.edu/ods/guidelines/documentation-guidelines (http://equity.psu.edu/ods/guidelines/documentation-guidelines)). If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.

Statement on Nondiscrimination and Harassment (Policy AD42)

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, gender identity or veteran status. Discrimination or harassment against faculty, staff or students will not be tolerated at The Pennsylvania State University. You may direct inquiries to the Office of Multicultural Affairs, 332 Information Sciences and Technology Building, University Park, PA 16802; Tel 814-865-0077 or to the Office of Affirmative Action, 328 Boucke Building, University Park, PA 16802-5901; Tel 814-865-4700/V, 814-863-1150/TTY. For reference to the full policy (Policy AD42: Statement on Nondiscrimination and Harassment): http://guru.psu.edu/policies/AD42.html (http://guru.psu.edu/policies/AD42.html)

Course Summary:

Date	Details	Due
Fri Jan 19, 2024	Week 2 Status check-in (https://psu.instructure.com/courses/2312014/assignments/15929730)	due by 11:59pm
Mon Jan 22, 2024	Partner Lab 1: The Capitalization Server (https://psu.instructure.com/courses/2312014/assignments/15929724)	due by 11:59pm
Mon Jan 29, 2024	Dig and Discuss (and write about it) (https://psu.instructure.com/courses/2312014/assignments/15940905)	due by 11:59pm

Date	Details	Due
Mon Feb 5, 2024	Quiz 1 (https://psu.instructure.com/courses/2312014/assignments/15947172)	due by 2pm
	Individual Assignment 1: The Pokemon API (https://psu.instructure.com/courses/2312014/assignments/15946292)	due by 11:59pm