



School of Engineering  
*Information  
Technology Program*

**ITP-483 "Communication for Software Engineers"**

**Units:** 2

**Fall**

Tuesday/1:00pm – 3:50pm

**Location:** OHE 542

**Instructor:** Matthew Whiting

**Office:** RRB 221

**Office Hours:**

Mondays 3-5 pm Zoom/Discord

<https://usc.zoom.us/j/93996765133>

Tuesdays 3-5 pm RRB 221

**Contact Info:**

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**Hours of Service:**

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## Catalogue Description

Expanding beyond your current technical skills, user focused design, problem space vs solution space, data structures, algorithms, coding challenges, live engineering demonstrations and presentations.

## Course Description

Communication and social skills are crucial to professional and advanced academic environments, and engineering students may not get enough practice in these areas. This class will help students prepare for the unique challenges of the transition from undergraduate study to the next phase of their careers. We will work specifically on the communication skills relevant to technical presentations in the context of both industry and academia such as technical interviews, research presentations, and other audiences.

## Learning Objectives

By the end of this course, students will be able to:

1. Discuss complex algorithms using the technical vocabulary of computer science.
2. Adapt the discussion of complex computer science topics using non-technical language for discussions with product owners and other less technical team members.
3. Demonstrate the ability to think logically and creatively under pressure by solving technical challenges on the whiteboard in real-time in front of an audience.
4. Translate non-technical descriptions into algorithms and source code.
5. Apply algorithms in creative ways to solve abstract problems.

**Prerequisite(s):** CSCI-104 or ITP-365

**Co-Requisite(s):** n/a

**Concurrent Enrollment:** n/a

**Recommended Preparation:** Students should be familiar with or be willing to quickly learn Python, and it is presumed that students already have experience with data structures and common algorithms as covered in the prerequisite courses.

## Course Notes

There are weekly lectures, and we will use [Blackboard](#) for course logistics. Slides during the course will be posted on [Blackboard](#) before the lecture begins.

A [Piazza](#) page will be used to communicate outside of class time.

Lecture topics will alternate between Third Space Thinking (TST) on odd weeks and software algorithms on even weeks.

TST represents the intersection between engineering and business and is characterized by communication and collaboration. The TST ideals help us to focus on understanding the needs of the client or customer so that we can design an engineering solution to effectively meet those needs.

Algorithm lectures will recap topics that students with the requisite knowledge have already learned while bringing a new focus on communication about these abstract topics in the context of different real-world situations such as the high-pressure environment of a technical interview or thesis defense.

With a significant focus on communication and social interaction, the course relies heavily on participation. Students will get practice in group activities and individual presentations.

In order to emulate the technical programming tests commonly included as part of job application, students will be asked to program algorithms which will be submitted and automatically graded using [codepost.io](https://codepost.io) (a platform that allows for automated grading and testing of code).

Finally, students will be called upon to expand their horizons on their own by finding industry-relevant articles and/or research papers. These will be presented by the students to practice valuable social communication skills that are not typically covered explicitly in software engineering courses.

### **Technological Proficiency and Hardware/Software Required**

The live programming challenges can be conducted in the language of the student's choice, but graded programming homework assignments must be done in Python. Using Python will allow students to write clean and concise solutions, enabling them to focus on the algorithm and not the language's syntax. For a development environment, it is recommended that they install [PyCharm](https://www.jetbrains.com/pycharm/) to reduce code compatibility issues.

### **USC Technology Support Links**

[Zoom information for students](#)

[Blackboard help for students](#)

[Software available to USC Campus](#)

### **Required Readings and Supplementary Materials**

*Cracking the Coding Interview: 189 Programming Questions and Solutions (6<sup>th</sup> Edition).* Gayle Laakmann McDowell. ISBN-13: 978-0984782857.

Links for article readings are listed below.

### **Optional Materials**

*Mindset: The New Psychology of Success,* Carol Dweck. ISBN-13 : 978-0345472328.

*The Lean Product Playbook: How to Innovate with Minimum Viable Products and Rapid Customer Feedback,* Dan Olsen. ISBN-13 : 978-1118960875.

*Managing Transitions: Making the Most of Change,* William Bridges. ISBN-13 : 978-0738213804.

*Harvard Business Review on Negotiation and Conflict Resolution.* ISBN-13: 978-1578512362.

### **Description and Assessment of Assignments**

#### *Homework*

Homework will be a combination of Third Space Thinking exercises and coding problems that apply to recently covered topics.

Technical homework assignments will be assigned on even weeks. These are python programs to be submitted on [codepost.io](https://codepost.io).

On odd weeks, homework assignments will focus on the TST material. These are typically submitted via [Blackboard](#).

In either case, homework needs to be completed individually prior to the beginning of the following class meeting. In addition, each student must be prepared to present their solutions for discussion with the class.

### *Homework Presentation*

At the beginning of each odd week, students will be expected to present their technical assignment solutions from the previous week. A few students will be selected, and each will explain their solution. This presents an opportunity for the presenter to practice with professional communication skills.

Each student is expected to present their technical homework assignment at least once during the semester.

### *In-Class Assignments*

We will also have several in-class assignments to review the reading material for that week. These are submitted on [Blackboard](#).

### *Industry Article Write-Ups*

On odd weeks, students will write a short summary (2-3 sentences) of a relevant tech article they must search out on their own. Articles must be taken from reputable tech news sites (for example [techcrunch.com](#), [wired.com](#)), a major news source that has a tech section, or a research paper. Summaries are to be submitted on [Blackboard](#), and at the beginning of class on even weeks, a few students will be chosen to present their summary for class discussion. The write up will be graded based on completeness.

Each student is expected to present their industry article summary at least once during the semester.

### *Live Coding Challenges*

On even weeks, several students will participate in a live assessment to demonstrate their knowledge and ability to articulate the covered topics. Each student will be asked to do a live coding challenge once during the semester. Students will be asked to write an algorithm on the whiteboard in front of the class. During the assessment, the other students will pay attention and make notes on what they thought was good/needed improvement. After the instructor's initial critique, the other students will have the opportunity to comment.

### *Final Coding Challenge*

In lieu of a final exam, students will be asked to complete a coding challenge on a predetermined course topic. The assessment can be completed from anywhere and will be administered via [codepost.io](#). The coding challenge will begin at the end of the final lecture meeting, and students will have until the end of the schedule final period for the course to complete and submit it. This amounts to approximately 1 week depending on the final schedule for the semester in question.

As an accompaniment to the final coding challenge students will complete a mock interview with the instructor. Each student must book a time to meet individually with the instructor between the last day

of class and the end of the final exam period. The meeting can occur either online or in person, and the student will be asked to demonstrate mastery of a randomly selected topic from throughout the semester as well as the skills to communicate in a professional setting.

### Grading Breakdown

Assignment	% of grade
<a href="#">Homework</a>	40
<a href="#">Homework Presentations</a>	10
<a href="#">In-Class Assignments</a>	10
<a href="#">Industry Article Write-Ups</a>	10
<a href="#">Live Coding Challenge</a>	10
<a href="#">Final Coding Challenge</a>	20
<b>TOTAL</b>	100

### Assignment Rubrics

#### [Homework](#)

Technical assignments are graded based on the ability to pass automated unit-tests. Each test passed is worth 10-20% of the overall score for that assignment and passing all tests will result in 100% for that assignment. These tests will cover the correctness of the algorithms, proper handling of edge-cases, and overall speed of the solution.

Most TST assignments are graded for correctness on [Blackboard](#) with equal weight given to each question.

The subjective TST assignments are graded for completeness.

#### [Homework Presentation](#)

Homework presentation will be graded by participation with equal weight given to the presentation of each of the technical homework presentation and the industry article summary.

#### [In-Class Assignments](#)

In-Class Assignments are auto-graded on [Blackboard](#).

#### [Industry Article Write-Ups](#)

Industry article write-ups are graded for completeness and for meeting the standard of quality expected.

#### [Live Coding Challenges](#)

For the live coding challenges, 40% of the grade is based on the student's ability to apply their technical knowledge to solve the problem. 40% of the grade is based on the student's ability to use TST techniques to effectively communicate given time pressure. The final 20% of the grade is based on whether the right answer was achieved.

#### [Final Coding Challenge](#)

As with the [Homework](#), the [Final Coding Challenge](#) will be graded using automated unit-tests on [codepost.io](#). These tests will cover the correctness of the algorithms, proper handling of edge-cases, and overall speed of the solution. Each test passed is worth 10-20% of the overall score for that assignment and passing all tests will result in 100% for that assignment.

As with the [Live Coding Challenges](#), the mock interview will be graded with 40% of the grade is based on the student's ability to express and apply their technical knowledge, 40% of the grade is based on the student's ability to use TST techniques to effectively communicate in high-pressure situations, and 20% based on whether the optimal answers were achieved.

### **Assignment Submission Policy**

All homework assignments will be submitted via either [Blackboard](#) or [codepost.io](#) as appropriate. Assignments submitted via email will not be accepted.

All assignments are due prior to the beginning of the following class period.

### **Remote learning Policies/Zoom etiquette**

During remote teaching situations, classes will meet via Zoom. Students are expected to participate via microphones and camera whenever possible.

Homework presentations will be done using screen sharing, and live coding challenges will leverage the virtual whiteboard in Zoom.

All homework assignments are turned in electronically either via [Blackboard](#) or [codepost.io](#).

### **Additional Policies**

Assignments may be submitted late but will incur a 25% deduction for each day after the due date. Due to the focus on communication skills, attendance is mandatory despite there being no attendance grade.

In-class assessments and presentations cannot be rescheduled (except for an unforeseeable event) as this will disrupt the course schedule. If you know you will be missing any classes at the beginning of the semester, please tell the instructor as soon as possible.

### **Synchronous session recording notice**

During remote teaching situations, the [Zoom](#) courses will be recorded, and these recordings will be shared with the class. While this will not entirely replace in-class participation, these recorded classes will allow students to catch up on lectures they were unable to attend as well as for useful review.

### **Sharing of course materials outside of the learning environment**

*SCampus Section 11.12(B)*

*Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services*

*publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).*

### Course Schedule: A Weekly Breakdown

Notes: TST - Referenced from Third Space Thinking Syllabus. TST readings are listed by a number but listed at the bottom of this chart

Week	Topic	Homework Due	In-Class Presentation	In-Class Assessments	Reading to do Before Session
1 Aug 23	Intro, Third Space Thinking Overview			In Class 01	McDowell §I-II, McDowell §IV-V
2 Aug 30	Big-O Algorithm Overview	HW01 blackboard, Article write up	Article summary	Live Coding Assessment	McDowell §VI, <a href="#">TST [1]</a>
3 Sep 6	TST: The importance of Mindset	HW02 codepost.io	Homework presentation	In Class 03	<a href="#">TST [2]</a> <a href="#">TST [3]</a> <a href="#">TST [4]</a>
4 Sep 13	Strings, Sets, Dictionaries, Lists, Tuples	Article write up	Article summary	Live Coding Assessment	McDowell §IX.1,
5 Sep 20	TST: Third Space Thinking and Making Ideas Tangible	HW04 codepost.io	Homework presentation	In Class 05	<a href="#">TST [5]</a> <a href="#">TST [6]</a> <a href="#">TST [7]</a>
6 Sep 27	Queue, Stack, Linked List	HW05 blackboard, Article write up	Article summary	Live Coding Assessment	McDowell §IX.2, McDowell §IX.3
7 Oct 4	TST: Problem Space Versus Solution Space	HW06 codepost.io	Homework presentation	In Class 07	<a href="#">TST [8]</a> <a href="#">TST [9]</a> <a href="#">TST [10]</a>
8	Trees, Graphs	HW07	Article summary	Live Coding	McDowell §IX.4,

Oct 11		blackboard, Article write up		Assessment	McDowell §VII
9 Oct 18	TST: Adaptability - The New Competitive Advantage	HW08 codepost.io	Homework presentation	In Class 09	<a href="#">TST [11]</a> <a href="#">TST [12]</a> <a href="#">TST [13]</a>
10 Oct 25	Recursion & Dynamic Programming	HW09 blackboard, Article write up	Article summary	Live Coding Assessment	McDowell §IX.8, McDowell §VI
11 Nov 1	TST: How Not to Get a Job	HW10 codepost.io	Homework presentation	In Class 11	<a href="#">TST [14]</a> <a href="#">TST [15]</a> <a href="#">TST [16]</a>
12 Nov 8	Sorting, Searching	HW11 blackboard, Article write up	Article summary, Homework presentation	Live Coding Assessment	McDowell §IX.9, McDowell §IX.10
13 Nov 15	TST: Culture and Alignment	HW12 codepost.io	Homework presentation	In Class 13	<a href="#">TST [17]</a> <a href="#">TST [18]</a>
14 Nov 22	Code review, source control	Article write up	Article summary	Live Coding Assessment	McDowell §VIII
15 Nov 29	Course Wrap- Up		Group Activity: Mock Interviews		
Final		Final Coding Challenge, Mock Interview	Due by the date of the scheduled final exam. Please see the Schedule of Classes for the University scheduled final exam date.		

## List of TST Readings

### Week 2

- [1] How Emotional Intelligence Became a Key Leadership Skill – Harvard Business Review, Andrea Owens  
<https://hbr.org/2015/04/how-emotional-intelligence-became-a-key-leadership-skill>

### Week 3

- [2] The Importance of Mindset – whitepaper, Richard Miller  
[http://www.olin.edu/sites/default/files/oct\\_16\\_white\\_paper-the\\_importance\\_of\\_mindset1.pdf](http://www.olin.edu/sites/default/files/oct_16_white_paper-the_importance_of_mindset1.pdf)
- [3] What Google Learned from its Quest to Build the Perfect Team  
<https://www.nytimes.com/2016/02/28/magazine/what-google-learned-from-its-quest-to-build-the-perfect-team.html>
- [4] Additional reading (optional):  
 Mindset: The New Psychology of Success, Chapters 1-3, Carol Dweck.



#### Week 5

- [5] Agile versus Lean versus Design Thinking

<https://medium.com/@jboogie/agile-vs-lean-vs-design-thinking-2329df8ab53c>

- [6] What Is Design Thinking and Why Is It So Popular?

<https://www.interaction-design.org/literature/article/what-is-design-thinking-and-why-is-it-so-popular>

- [7] Additional reading (optional):

Olsen D (2015) The Lean Product Playbook, Introduction + Chapters 1 and 2

#### Week 7

- [8] Problem Space vs Solution Space, Nikhil Gupta -

<https://medium.com/@nikhilgupta08/problem-space-vs-solution-space-f970d4ace5c>

- [9] Why Human Centered Design Matters, Wired Magazine

<http://www.wired.com/insights/2013/12/human-centered-design-matters/>

- [10] Additional reading (optional):

Olsen D (2015) The Lean Product Playbook, Chapters 3 and 4

#### Week 9

- [11] Adaptability: The New Competitive Advantage, Harvard Business Review

<https://hbr.org/2011/07/adaptability-the-new-competitive-advantage>

- [12] Constantly Changing Technologies: What's a Software Developer To Do?, Mashable

<https://mashable.com/2010/12/20/constantly-changing-technologies/>

- [13] Additional reading (optional):

Bridges, W (2009) Managing Transitions, Chapter 6: How to Deal with Non-Stop Change

#### Week 11

- [14] Ferrari, B (2012) The Executive's Guide to Better Listening, McKinsey Quarterly

<https://www.mckinsey.com/featured-insights/leadership/the-executives-guide-to-better-listening#>

- [15] Mark Balbes (2014) Conflict and Resolution in the Agile World, ADTMag

<https://adtmag.com/articles/2014/12/17/agile-conflict-resolution.aspx>

- [16] Additional reading (optional):

Harvard Business Review on Negotiation and Conflict Resolution, Chapter 3: The Team That Wasn't

#### Week 13

- [17] Katzenbach, J (2012) Cultural Change that Sticks – Harvard Business Review -

<https://hbr.org/2012/07/cultural-change-that-sticks>

- [18] Bennet, Milton J. (2014) The Development Model of Intercultural Sensitivity -

<https://www.idrinstitute.org/dmis/>

## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](https://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](https://policy.usc.edu/scientific-misconduct).

### Support Systems:

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](https://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](https://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](https://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298*

[equity.usc.edu](https://equity.usc.edu), [titleix.usc.edu](https://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](https://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](https://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.

*Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)*

[ombuds.usc.edu](http://ombuds.usc.edu)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.