University of South Carolina
Department of Computer Science and Engineering
CSCE 544 Functional Programming
Spring 2026

Instructor	Peng Fu
Email	pfu@cse.sc.edu
Meeting Times	Tuesday and Thursday (1:15-2:30pm)
Meeting Location	300 Main St. (B101)
Office Location	Innovation Center (INNOVA) 2229
Office Hours	Tuesday and Thursday (12pm-1pm)
Midterm	Thursday, March 5 (1:15pm-2:30pm)
Final	Tuesday, May 5 (12:30pm - 3pm)

Academic Bulletin Description

CSCE 544 - Functional Programming (3 Credits)
Functional programming as a paradigm. History of functional programming languages: Lisp, FP/FL, Scheme, ML, Miranda, Haskell. Programming in Haskell at an intermediate level: recursive and higher-order functions, list comprehensions, types and classes, monads, lazy evaluation, reasoning about programs.

Prerequisites

C or better in CSCE 330, CSCE 350, or MATH 374.

Course Learning Outcomes

Upon successful completion of this course, students should be able to:

- Demonstrate the ability to design a functional programming solution to algorithmic problems.
- Demonstrate the ability to write programs of intermediate complexity in Haskell.
- Demonstrate the ability to prove the correctness of simple functional programs.

Graduate students will also be able to demonstrate the ability to evaluate an important paper from the peer-reviewed literature on functional programming and assess its contribution by writing a report and preparing a presentation.

Textbooks

There is no required textbooks. There will be reading materials available from the course website.

Grades calculation

- 40% Homework.
- 15% Class participation.
- 15% Midterm exam.
- 30% Final exam.

The grading scale is, $90 \leq$ A ≤ 100, $85 \leq$ B+ < 90, $80 \leq$ B < 85, $75 \leq$ C+ < 80, $70 \leq$ C < 75, $65 \leq$ D+ < 70, $60 \leq$ D < 65, F < 60.

Graduate Student Assessment

Graduate students will also be required to present a 30-minute presentation with pdf or PowerPoint slides, describing and evaluating a paper from the peer-reviewed literature. This additional work is not part of the numeric grade calculation, but it is required and worth up to a letter grade. A graduate student who does not complete the report and the presentation will lose a full letter grade.

Assignment and Assessment Policy

All the homework assignments and presentation slides have to be done individually. Homework and slides must be submitted through Blackboard. Grade appeals for any assessment must be requested (via email to me) within three days of my posting of the grade. While I will always answer your questions on the grading of an assessment, your score on the assignment will not be changed unless you request a grade review during the 3-day grade appeal time period.

Late Homework Policy

Late homework is accepted with a 10% penalty until the beginning of the class after the due date.

Tentative Course Plan

WEEK	TOPIC
1	Introduction to functional programming in Haskell
2	Recursive function, pattern matching and algebraic data types
3	Higher order functions and folds
4	Type classes
5	Monads
6	State monad
7	Parser combinators
8	Monad transformers
9	Quickcheck introduction
10	Property-based testing with Quickcheck
11	Continuation Passing Style
12	Concurrency monad I
13	Concurrency monad II

No use of generative AI tools permitted

This course assumes that work submitted by students – all process work, drafts, brainstorming artifacts, final works – will be generated by the students themselves, working individually or in groups as directed by class assignment instructions. This policy indicates the following constitute violations of academic honesty: a student has another person/entity do the work of any substantive portion of a graded assignment for them, which includes purchasing work from a company, hiring a person or company to complete an assignment or exam, and/or using generative AI tools (such as ChatGPT).

Academic Integrity

As a partner in your learning, it is important to both of us that any assignment submission is a pure reflection of your work and understanding. The introduction of artificial intelligence options to complete academic work jeopardizes my ability to evaluate your understanding of our course content and robs you of the ability to master the subject matter.

Suspicions of use of artificial intelligence aids will be referred to the Office of Academic Integrity as alleged violations of Cheating, defined as "unauthorized assistance in connection with any academic work" and/or Falsification, which includes "Misrepresenting or misleading others with respect to academic work or misrepresenting facts for an academic advantage". You are expected to practice the highest possible standards of academic integrity. Any deviation from this expectation will result in a minimum academic penalty of your failing the assignment, and will result in additional disciplinary measures. This includes improper citation of sources, using another student's work, and any other form of academic misrepresentation. The first tenet of the Carolinian Creed is, "I will practice personal and academic integrity." Below are some websites for you to visit to learn more about University policies:

- Carolinian Creed (`http://www.sa.sc.edu/creed`)
- Academic Responsibility (`http://www.sc.edu/policies/staf625.pdf`)
- Office of Student Conduct and Academic Integrity (`https://www.sa.sc.edu/academicintegrity/`)
- Information Security Policy and Standards (`https://sc.edu/about/offices_and_divisions/division_of_information_technology/security/policy/universitypolicy/`)

Disability Services

Student Disability Resource Center (`http://www.sa.sc.edu/sds/`): The Student Disability Resource Center (SDRC) empowers students to manage challenges and limitations imposed by disabilities. Students with disabilities are encouraged to contact me to discuss the logistics of any accommodations needed to fulfill course requirements (within the first week of the semester). In order to receive reasonable accommodations from me, you must be registered with the Student Disability Resource Center (1705 College Street, Close-Hipp Suite 102, Columbia, SC 29208, 803-777-6142). Any student with a documented disability should contact the SDRC to make arrangements for appropriate accommodations.

Mental Health

If stress is impacting you or getting in the way of your ability to do your schoolwork, maintain relationships, eat, sleep, or enjoy yourself, please reach out to any of our mental health resources. Most of these services are offered at no cost as they are covered by the Student Health Services tuition fee. For all available mental health resources, check out Student Health Services Mental Health (`https://www.sc.edu/about/offices_and_divisions/health_services/mental-health/index.php`) and the quick reference list below.

- Wellness Coaching can help you improve in areas related to emotional and physical wellbeing (e.g., sleep, resiliency, balanced eating and more) – schedule an appointment at (803) 777-6518 or on MyHealthSpace (`https://myhealthspace.ushs.sc.edu/login_dualauthentication.aspx`)
- Access virtual self-help modules via Therapy Assistance Online (TAO) (`https://us.taoconnect.org/register`) – see TAO registration instructions (`https://www.sc.edu/about/offices_and_divisions/health_services/medical-services/counseling-and-psychiatry/online-support/index.php`).
- Access additional articles and videos on health and wellness topics on the Wellness Hub, thriveatcarolina.com, or by downloading the CampusWell (`https://www.campuswell.com/`) app and searching for University of South Carolina.
- Counseling & Psychiatry offers individual and group counseling and psychiatric services – schedule an appointment at (803) 777-5223 or on MyHealthSpace (`https://myhealthspace.ushs.sc.edu/login_dualauthentication.aspx`).
- Access the 24-hr Mental Health Support Line at (833) 664-2854.
- Access an anonymous mental health screening program (`https://www.uscscreening.org/welcome.cfm?access=website`)