Tutorial 302: Modernizing the CS Introductory Sequence with Parallel and Distributed Computing (and some AI)

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https://tcpp.cs.gsu.edu/curriculum/

Introduction and Goals

- Welcome and Introduction
- Project goals, timelines
- Outcomes and Agenda of the Tutorial

Introduction

- Name
- Where and What you teach
- What you are hoping to do with what you learn today

TCPP Curriculum Initiative

What should every Computer Science and Engineering Student know about Parallel and Distributed Computing (PDC)?
https://tcpp.cs.gsu.edu/curriculum/

- **Areas:** Programming, Architecture, & Algorithms
  - Version 1 – 2012
- **New Aspects:** Big Data, Energy, Distributed Computing, Pervasive topics
  - Version-2-beta released 2020

- **Companion Activities:**
  - CE-oriented TCPP Curriculum
  - Modernizing CS1/CS2 Exemplars
    - 2 Development Teams
    - Recruited 6 Testing teams
  - CDER Book Vol 3
    - Experience of Adopters
      - Exemplars + Resources
  - JPDC Special Issues

NSF CS1/CS2 Exemplar Project Vision

- Vision: Create modern course exemplars for CS1 and CS2 courses to serve as national models
  - built around a modern conceptual model of computation that includes parallel and distributed processing
  - rigorous evaluation of their effectiveness
  - adoptable across a diverse group of colleges and universities

Development and Testing Teams

- Development teams:
  - Knox College
    - David and Jamie
  - Tennessee Tech
    - April and Jerry
- Other CDER partners
  - UMass
    - Chip and Neena
  - Maryland
    - Alan
  - LSU
    - Vaidy
  - UTSA
    - Sushil

- Testing Teams:
  - Casper college
    - Charlotte Gruner
  - Hawaii Pacific U.
    - Mary Smith
  - Montclair U.
    - Michelle Zhu and Jiayin Wang
  - Southern Indiana
    - Srishti Srivastava
  - U. Nebraska Lincoln
    - Chris Bourke
  - Webster College
    - Xiaoyuan Suo (Sue) and Peter Maher

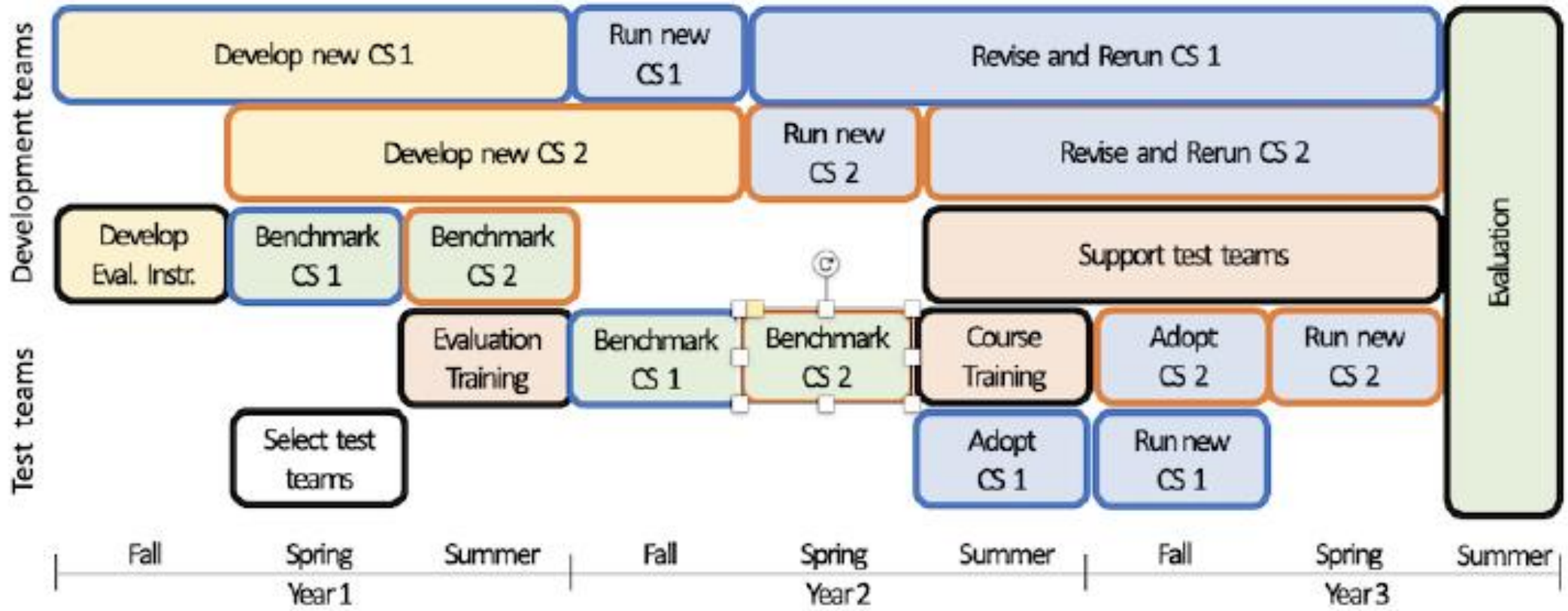

Figure 1: Schedule for development and test teams. Box fill colors categorize activities as development (yellow), evaluation (light green), training and support (peach), and running the new courses (purple).

Primary Themes in Modernizing CS1/CS2

- Data Parallelism
- Elements of Distributed Computing
- Event Handling

- Explore LLM aspects

Outcomes of this Tutorial

- Give you insights into ways of incorporating Parallel and Distributed Computing (PDC) into early courses
- Help you become curriculum innovators
- Connect you with potential collaborators

Agenda

7:15 PM	Unplugged Flagmaker Activity CS1 Plugged Activity - Distributed Data
8:00 PM	Break
8:20 PM	CS2 Plugged Activity - Parallel Sort Open MP
8:45 PM	Integrating PDC Topics in CS1 & CS2
9:15 PM	GenAI in CS1 & CS2
9:45 PM	CDER Center Opportunities & Resources, Closing & Survey