ICHEC
Irish Centre for High-End Computing

High Performance Computing and Parallel Programming: ACM40640/PH504

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General Overview

The goal is to gain understanding of different parallel programming paradigms as well as understanding different HPC architectures using best practice.

Working knowledge of either C or Fortran programming language is required for this module.

Lectures:

The lectures are all video recorded. There are between **30-40 minutes of pre-recorded lecture materials** available each week, with accompanying pdfs

You can watch these in your own time throughout the week.

Practicals:

There will be a practical of the week to complete before the next week's Q&A sessios.

Q&A Sessions:

Q&A session: **Tuesday 11am-1pm** covering the previous week's practical. The practicals will be covered in a live coding session, however if there are any other questions, please post them in the forums so we can answer/cover them.

General Overview

There will be two Virtual Office hours. New Zoom link will be shared.

Assessment:

- Assignments (70% total grade, 35% each): There will be 2 assignments spread over the course, which need to be uploaded to Brightspace/Blackboard. The normal rules governing plagiarism apply. Remember to comment your code!
  - Assignment 1: Tuesday 21st February → Tuesday March 28th
  - Assignment 2: Tuesday 28th March → Tuesday April 18th
- Exam (30% total grade)
  - Tuesday 25th April (3 hours to complete)

Due to widespread of participating students across multiple universities, all Q&A sessions will be held online. Exam will be held online.

Week#	Tuesday Date	Q&A Session	Deadlines	Topic
1	24th Jan, 11am	Intro session		Introduction to HPC and HPC Architectures
2	31st Jan, 11am	practical 1		Parallel Performance and Programming Models
3	7th Feb, 11am	practical 2		Introduction to OpenMP
4	14th Feb, 11am	practical 3		OpenMP Loop and Synchronisation Constructs
5	21st Feb, 11am	practical 4	Assignment1 released	OpenMP versions after 2.5
VIRTUAL OFFICE: 24th Feb Friday, 11am-12pm				
6	28th Feb, 11am	practical 5		Introduction to MPI
7	7th Mar, 11am	practical 6		MPI Point to Point Communication
TWO WEEKS BREAK				
8	28th Mar, 11am	practical 7	Assignment1 due 5:30pm Assignment2 released	MPI Collective Communication
VIRTUAL OFFICE: 30th Mar Thursday, 11am-12pm				
9	4th April, 11am	practical 8		MPI Communicators and Virtual Topologies
10	11th April,11am	practical 9, 10		MPI Derived Datatypes
	18th April		Assignment2 due 5:30pm	
FINAL EXAM: 25/04/2023 Tuesday 11am-2pm				

Logging into sciprog

- A successful login will appear as the following
- Watch How to SSH recording for login information
- Your passwords will not appear as you type
- Ensure that your new password is longer than 20 characters
- Usernames available in Usernames.pdf on Brightspace/Blackboard
- NB: Your assignments, exams will be marked on sciprog, so ensure that all submitted material is can be compiled and run on sciprog

```
Chris-MBP-5:~ chris$ ssh sp1@sciprog.ichec.ie
sp1@sciprog.ichec.ie's password:
You are required to change your password immediately (root enforced)
WARNING: Your password has expired.
You must change your password now and login again!
Changing password for user sp1.
Changing password for sp1.
(current) UNIX password:
New password:
BAD PASSWORD: The password is shorter than 20 characters
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
Connection to sciprog.ichec.ie closed.
Chris-MBP-5:~ chris$
Chris-MBP-5:~ chris$
Chris-MBP-5:~ chris$ ssh sp1@sciprog.ichec.ie
sp1@sciprog.ichec.ie's password:
Last login: Fri Sep 25 14:45:23 2020 from glasnost.ichec.ie
[sp1@sciprog ~]$
```

For any update/queries:

Announcements on Blackboard/Brightspace

Discussion Forum on Blackboard/Brightspace

Emails:

buket.gursoy@ichec.ie

jake.williams@ucdconnect.ie

Links:

nuigalway.blackboard.com

brightspace.ucd.ie

https://github.com/ICHEC-learn/ACM40640-PH504

Zoom:

https://nuigalway-ie.zoom.us/j/93328548207?pwd=SEZCRklucHpKOG1CQUVOajYycEdJZz09