

# AMC 140 PART C: SOLVING PROBLEMS IN MATHEMATICAL COMPUTING I

WILLIAM EMMANUEL S. YU

## 1. PREREQUISITES

AMC21, AMC22, AMC140A, AMC140B

## 2. AIMS

This section of the course aims to familiarize the students with some common parallel programming and software development tools.

## 3. COURSE COMPOSITION

### 3.1. Introduction to Unix Software Development Tools.

**Duration:** 2 meetings

**Major Requirement:** None

**Coverage:**

- (1) GNU Software Development Tools (gcc, gdb and others)
- (2) GNU Software Build Systems (make)

### 3.2. Introduction to the AGILA HPCS.

**Duration:** 1 meeting

**Major Requirement:** None

### 3.3. Introduction to Parallel Programming.

**Duration:** 1 meeting

**Major Requirement:** None

### 3.4. Parallel Programming with Message Passing Interface.

**Duration:** 3 weeks

**Major Requirement:** Major Programming Project

**Coverage:**

- (1) Introduction to MPI concepts (Communicators, Rank and others)
- (2) Introduction to Message Passing
- (3) Basic MPI routines
- (4) Point-to-point routines
- (5) MPI status checking
- (6) Collective communications
- (7) Parallel I/O w/ MPI ROMIO

### 3.5. Parallel Programming w/ MPI in Java.

**Duration:** Optional

**Major Requirement:** Programming Exercise

### 3.6. Parallel Programming with Parallel Extensible Toolkit for Scientific Computing.

**Duration:** Optional

**Major Requirement:** Programming Exercise

MATHEMATICS DEPARTMENT, ATENEO DE MANILA UNIVERSITY, LOYOLA HEIGHTS, QUEZON CITY, 1108 PHILIPPINES  
E-mail address: [william.s.yu@ieee.org](mailto:william.s.yu@ieee.org)