Program in Computing (PIC) and Departmental Computing

Michael Andrews
PIC Director and PIC Assistant Adjunct Professor

UCLA

September 22, 2021
PIC - Enrollment and Personnel

PIC is a program to provide beginning and intermediate level instruction in programming languages for students in the physical sciences.

2017-2021 enrollment: > 2100 students/year

Current Director
Michael Andrews

Chief Administrative Officer
Ronke Epps

Student Services Manager
Leticia Dominguez

Computing Manager
Derek Ogata

Continuing 2021-2022 Instructors
Michael Andrews
Hanqin Cai
Phil Chodrow
Weiqi Chu
Alex Lin
Mike Lindstrom
Mike Perlmutter
Minh Pham

New 2021-2022 Instructors
Burnett, Sarah (joining in Winter)
Harlin Lee
Jean-Michel Maldague
Mike Murray
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We will be hiring one or more PIC adjuncts.

- At least 30% of our instructors should be called Michael, Mike, Michel, Michele, or Michelle.
PIC - Hiring adjuncts and employing TAs

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▶ At least 30% of our instructors should be called Michael, Mike, Michel, Michele, or Michelle.
▶ Just kidding...
PIC - Hiring adjuncts and employing TAs

We will be hiring one or more PIC adjuncts.

▶ Excellent teaching record and a strong interest in teaching.
▶ Background in C.S. or a strong interest in computation or computational tools.
▶ Research interests that overlap with a research group in our department.

We always need PIC TAs.

▶ Undergraduate background that includes programming or has taken Math 280.
▶ An interest in learning new aspects of programming and new programming languages.
Math graduate students are hired as PIC TAs.

- A lack of PIC TAs is not a sufficient reason for a math graduate student to be assigned a teaching position in PIC.

- If a math graduate student is in need of support and is capable of being a PIC TA, then they are hired before looking at graduate students from other departments.

- If a math graduate student is capable of being a PIC TA, then they are not required to be a PIC TA. They can still continue to TA math classes and preferences are paid attention to.
Math 280: Programming++ for Mathematics Graduate Students

- Winter 2020...
  - 21 graduate students enrolled with 3 students auditing;
  - 19 math, 4 chemistry, 1 mechanical engineering.

- Spring and Fall 2020 had 3 math students from Math 280 TAing for PIC.

- Math 280 will be offered again in Spring 2022 (P/NP).
A lot of the math we teach is over 100 years old and many of our classes are unlikely to change too much.

C++98, C++11, C++14, C++17.

Python 2 recently died; in the last four years we’ve updated from Python 3.6 to 3.9, and libraries change rapidly.

Goal...

Create enough flexibility in the syllabi of our advanced classes to evolve with the languages and libraries.

Create more rigid syllabi for our introductory classes, so that there is more uniformity across different instructors’ classes.
Departmental Computing - Slack workspace for PIC

Instructors can invite their TAs to their class channel.

# = available to all instructors upon joining the workspace
🔒 = available to instructors who want to join
### Departmental Computing - Box for PIC

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Proposed update to CATALOG DESCRIPTION

(5) Lecture, three hours; discussion, two hours. No prior programming experience assumed. Basic principles of programming, integrated development environments, using C++; algorithmic, procedural problem solving; variables, assignment, fundamental types (int, double, char, bool, size_t, etc.), casting; cin, cout, control flow; the string class, the vector class; functions, function overloading, references; structs and classes, constructor initializer lists; const correctness, source code organization, well-documented code; C-style arrays, pointers (but no memory allocation). P/NP or letter grading.

COURSE OBJECTIVES
10A serves as the introductory programming class for the Program In Computing (PIC). C++ is an excellent language for introducing students to coding because many of the fundamental concepts (data types and memory management, for example) are addressed explicitly by the language. When starting to code with other languages (such as Python) students can be lulled into thinking that such concepts can safely be ignored when, in fact, understanding them is essential to being a good programmer. Moreover, once these concepts are well understood, other languages are easier and quicker to learn, and one can better understand the advantages and disadvantages of different languages for solving different problems. 10A covers a lot of ground. Upon completion of the class, a student will be familiar with console input/output, control flow, functions, and classes (object oriented programming). An ambitious and imaginative student will already be able to implement their own interesting applications of coding elegantly.

COURSE SYLLABUS and an APPROXIMATE SCHEDULE
The following approximate schedule details the topics that 10A instructors should teach. Except where clearly indicated, all topics should be covered. The time spent on each topic and the order in which the material is taught can be changed by an instructor to suit their teaching style and their vision for the class.

Approximately 4 lectures on...

1. Hello world, cout
2. Errors
   a) build errors
   b) runtime errors
   c) other errors
3. Variables, assignment, and simple uses of cin >> variable
4. Fundamental types
   a) ints, doubles, arithmetic
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<td>PIC 40A</td>
<td>Introduction to Programming for Internet</td>
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**General Course Outline**

**Catalog Description**

(5) (Formerly numbered 40.) Lecture, three hours; discussion, two hours; laboratory, eight hours. Enforced requisite: course 10A. Recommended: course 10B. Introduction to core technologies of Internet, with focus on client-side Web programming. Fundamental protocols, static Web pages, Perl language, Common Gateway Interface, XML. P/ NP or letter grading.

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<tr>
<td>PIC 10B</td>
<td>Intermediate Programming</td>
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Have made a Chegg account for all PIC instructors.
- Activation codes are sent to a Slack channel in our workspace.
Last year...

- Most of our SSNs were leaked to the dark web.
- I made a video demonstrating that I could obtain any instructor’s UID. (I reported it and it’s been fixed now.)

Consequently...

- There will be lots of changes to make things more secure.
- Make sure you’re ready emotionally.
Departmental Computing - Bugs

Derek Ogata (also Computing Manager)  
Eric Manesh (also PIC Lab Manager)  
Linda Bingham  
Chris Carlos  
Clinton Lam  
Juan Tan
Thank you for listening!