

# **INTERACTIVE DATA LANGUAGE (IDL) DECAL**

## **UNIVERSITY OF CALIFORNIA AT BERKELEY**

### **DEPARTMENT OF ASTRONOMY**

#### **PAUL HIGGINS<sup>1</sup>**

## **1 Introduction**

**This course is designed to introduce the student to computer programming using the Interactive Data Language (IDL).** This will prepare the student for the upper division astronomy labs (Astro 120, 121, and 122).

IDL is the primary data reduction language used by astronomers for scientific research. We will first cover topics such as an introduction to the UNIX environment (in which our IDL configuration runs), basic logic programming, math operators, data types, and useful functions. We will then apply these concepts to writing software for data analysis. If you are already proficient in a programming language, be forewarned that this course will start from a very basic level. That is to say that we will cover as many advanced programming techniques as we have time for.

This course is intended for (intended/declared) astronomy majors but should prove to be useful for students of any major who would like an introduction to programming. As a language, IDL has simple syntax and is a very good first language to learn.

## **2 Course Specifics**

**Faculty Supervisor: Carl Heiles**

**Facilitator: Paul Higgins**

**Listing: ASTRO 98/198**

**CCN: 06763 / 06802**

**Units: 1-4**

### **2.1 Lectures**

**When: Weekly on Wednesday from 6:00 - 7:30 pm** (may be subject to change)

**Where: Campbell 705** (the undergraduate astronomy laboratory)

**Office Hours: 1 - 2 PM** Campbell 705

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**Contact: phiggins {at} ssl {dot} berkeley {dot} edu**

## 2.2 Assignments

There will be one assignment every week designed to teach the student to implement the programming techniques learned in class. **The assignments will be due on FRIDAYS** (a week and a half from when they are assigned). Your programs should be linked on your home pages for easy grading.

## 2.3 Grading

The bulk of the class points are from assignments. **Assignments** will be graded as follows:

10points = The assignment was completed.

5 - 9points = The assignment was turned in incomplete.

0 = The assignment was not turned in.

◇ There will also be several **in-class group assignments**. You will be graded as a group for these.

◇ Finally, there will be a **final project** which will be somewhat more involved than the other assignments.

This will be worth 20points.

◇ **Class attendance** will award you .66 extra credit points per lecture. This will sum over the semester to the points for one homework assignment.

**70% and above is a PASSING GRADE**

**Less than 70% is a FAILING GRADE**

## 3 Course Outline

Week 0: Wed, Jan 23<sup>rd</sup> - UG Astro Accounts

Week 1: Wed, Jan 30<sup>th</sup> - Unix and IDL Basics

Week 2: Wed, Feb 6<sup>th</sup> - Functions, Procedures, and Keywords

Week 3: Array Functions and Manipulation

Week 4: Vectors -> Histograms and Plotting

Week 5: Strings -> Parsing, Loading Data

Week 6: Images -> Loading, Plotting, Manipulating  
(Contrast/Threshold)

Week 7: Colors and Color Tables

Week 8: Data Structures

Week 9: (Pseudo) Object Oriented Programming

Week 10: Guide To Good Graphics

# GRADING CONTRACT

I have **read** and **understand** the requirements for passing this IDL (Interactive Data Language) Decal course, Astronomy 98 and 198 (taught in Spring 2008), as put forth in the syllabus.

**The syllabus is available on the website:**

[http://ugastro.berkeley.edu/~phiggins/idl\\_decal/syllabus2.pdf](http://ugastro.berkeley.edu/~phiggins/idl_decal/syllabus2.pdf)

I understand that earning above 70% of the total earn-able points will result in a **PASSING** grade.

I also understand that earning less than 70% of the total earn-able points will result in a **FAILING** grade.

Class Group Name: \_\_\_\_\_

Group Members: \_\_\_\_\_

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_