

### Basic Course Information

|                   |                           |                     |  |
|-------------------|---------------------------|---------------------|--|
| Semester:         | <b>Spring 2020</b>        | Instructor Name:    | <b>Dr. Russell Lavery</b>  |
| Course Title & #: | <b>Astronomy 100</b>      | Email:              | <b>Russell.Lavery@imperial.edu</b>   |
| CRN #:            | <b>20022</b>              | Webpage (optional): | <b><a href="http://spaces.imperial.edu/russell.lavery/ASTR100/front100.html">http://spaces.imperial.edu/russell.lavery/ASTR100/front100.html</a></b> |
| Classroom:        | <b>2727</b>               | Office #:           | <b>2777</b>  |
| Class Dates:      | <b>Feb. 18 to June 12</b> | Office Hours:       | <b>Monday: 8:30 AM to 9:30 AM<br/>Tuesday: 11:30 AM to 12:30 PM<br/>Wednesday: 2: 00 PM to 3:30 PM<br/>Thursday: 11:30 AM to 12:30 PM</b>            |
| Class Days:       | <b>Tuesday-Thursday</b>   | Office Phone #:     | <b>760-355-6202</b>  |
| Class Times:      | <b>1:00 to 2"25</b>       | Emergency Contact:  | <b>Ofelia Duarte : (760) 355-6155<br/>Silvia Murray: (760) 355-6201</b>  |
| Units:            | <b>3</b>                  |                     |  |

### Course Description

**An introduction to the principles of astronomy, including physical evolution, tools of the astronomer, the sky, the solar system, the stars, the galaxies and the universe. (CSU, UC)**

### Course Prerequisite(s) and/or Corequisite(s)

**There are no prerequisites for this course.**

### Student Learning Outcomes

**Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:**

- 1. comprehend the workings of the seasons around the Earth and their intrinsic cause. (ILO2, ILO5)**
- 2. determine the phases of the Moon based on its location with respect to the Earth and the Sun. (ILO2)**
- 3. conceptualize, both in physical size and in time of formation, the differences between the Solar System and the Universe. (ILO2)**

## Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Demonstrate knowledge of the periodic motions of objects on the celestial sphere and their observable effects.
2. Demonstrate knowledge that astronomers locate objects in the sky through the use of a celestial coordinate system.
3. Demonstrate knowledge of the history and theories of Astronomy. The student will differentiate between the ideas of Brahe, Kepler, Galileo, Newton, and others.
4. Discuss the Sun as the center of our solar system, the scale of our solar system, and the origin of the solar system.
5. Describe the similarities and differences between the terrestrial and jovian planets, both as categories of planets and on an individual basis.
6. Describe the physical evolution of stars: their process of formation, their main-sequence lifetimes and means of energy production, and their final evolutionary processes which lead to the various types of stellar remnants.
7. Describe the basic components of the Milky Way galaxy and demonstrate knowledge of the different types of galaxies, to understand that galaxies are fundamental units of the universe, and the origins of galaxies.
8. Discuss the scientific theory for the physical evolution of the Universe, from its beginning in what is known as the "Big Bang" through to its ultimate fate of being "open" or "closed".

## Textbooks & Other Resources or Links

*Pathways to Astronomy*, by Stephen Schneider & Thomas Arny. (5<sup>th</sup> ed.) ISBN: 987-1-260-01270-5

Course Web Page: <http://spaces.imperial.edu/russell.lavery/ASTR100/front100.html>

## Course Requirements and Instructional Methods

### Assignments:

- Reading and Writing:
1. Two written short essays (1-2 pages in length), one involving the description several astronomical images selected by the student and the second being summary of the mechanisms for the production of elements, besides hydrogen and helium, in the Universe.
  2. In-class peer learning activities (3-4 pages in length) completed by the students working together with only modest instructor involvement

- Out-of-class:
1. Assigned reading in textbook (10 to 30 pages per week), supplemental handouts and on-line course notes.
  2. Assignments involving mathematical relations covering , but not limited to the following: the changing altitude of the Sun (seasons); applications of Kepler's Laws of Planetary Motion; radio-isotopic dating (for the determination of the age of the Earth and Solar

System); relationships involving temperature, wavelength and energy of photons of light; applications of the mass-luminosity relation for stars determining the lifetimes of different mass stars.

3. Conceptual assignments involving the rising and setting times of various lunar phases, physical size of the Milky Way galaxy, and the expansion properties of the Universe.

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

### Course Grading Based on Course Objectives

**Course Grading: 3 Mid-term Exams (15% each exam) 45% of final grade**

**Final Exam 20% of final grade**

**4 Homework Exercises 25% of final grade**

**2 Written Assignments (5% each) 10% of final grade**

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**TOTAL 100%**

### Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See [General Catalog](#) for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

### Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.

- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the [General Catalog](#).
- Children in the classroom: Due to college rules and state laws, only students enrolled in the class may attend; children are not allowed.

### Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

### Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the [General Catalog](#) for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

## Additional Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- **CANVAS LMS.** Canvas is Imperial Valley College's main Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- **Learning Services.** There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).
- **Library Services.** There is more to our library than just books. You have access to tutors in the [Study Skills Center](#), study rooms for small groups, and online access to a wealth of resources.

## Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the [Disabled Student Programs and Services \(DSP&S\)](#) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

## Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee.

- **Student Health Center.** A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC [Student Health Center](#) at 760-355-6128 in Room 1536 for more information.
- **Mental Health Counseling Services.** Short-term individual, couples, family and group counseling services are available for currently enrolled students. Services are provided in a confidential, supportive, and culturally sensitive environment. Please contact the IVC Mental Health Counseling Services at 760-355-6310 or in the building 1536 for appointments or more information..

## **Veteran's Center**

The mission of the [IVC Military and Veteran Success Center](#) is to provide a holistic approach to serving military/veteran students on three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie; to serve as a central hub that connects military/veteran students, as well as their families, to campus and community resources. Their goal is to ensure a seamless transition from military to civilian life. The Center is located in Building 600 (Office 624), telephone 760-355-6141.

## **Extended Opportunity Program and Services (EOPS)**

The Extended Opportunity Program and Services (EOPS) offers services such as priority registration, personal/academic counseling, tutoring, book vouchers, and community referrals to qualifying low-income students. EOPS is composed of a group of professionals ready to assist you with the resolution of both academic and personal issues. Our staff is set up to understand the problems of our culturally diverse population and strives to meet student needs that are as diverse as our student population.

Also under the umbrella of EOPS our CARE (Cooperative Agency Resources for Education) Program for single parents is specifically designed to provide support services and assist with the resolution of issues that are particular to this population. Students that are single parents receiving TANF/Cash Aid assistance may qualify for our CARE program, for additional information on CARE please contact Lourdes Mercado, 760-355- 6448, [lourdes.mercado@imperial.edu](mailto:lourdes.mercado@imperial.edu).

EOPS provides additional support and services that may identify with one of the following experiences:

- Current and former foster youth students that were in the foster care system at any point in their lives
- Students experiencing homelessness
- Formerly incarcerated students

To apply for EOPS and for additional information on EOPS services, please contact Alexis Ayala, 760-355-5713, [alexis.ayala@imperial.edu](mailto:alexis.ayala@imperial.edu).

## **Student Equity Program**

- The Student Equity Program strives to improve Imperial Valley College's success outcomes, particularly for students who have been historically underrepresented and underserved. The college identifies strategies to monitor and address equity issues, making efforts to mitigate any disproportionate impact on student success and achievement. Our institutional data provides insight surrounding student populations who historically, are not fully represented. Student Equity addresses disparities and/or disproportionate impact in student success across disaggregated student equity groups including gender, ethnicity, disability status, financial need, Veterans, foster youth, homelessness, and formerly incarcerated students. The Student Equity

Program provides direct supportive services to empower students experiencing insecurities related to food, housing, transportation, textbooks, and shower access. We recognize that students who struggle meeting their basic needs are also at an academic and economic disadvantage, creating barriers to academic success and wellness. We strive to remove barriers that affect IVC students' access to education, degree and certificate completion, successful completion of developmental math and English courses, and the ability to transfer to a university. Contact: 760.355.5736 or 760.355.5733 Building 100.

- The Student Equity Program also houses IVC's Homeless Liaison, who provides direct services, campus, and community referrals to students experiencing homelessness as defined by the McKinney-Vento Act. Contact: 760.355.5736 Building 100.

### **Student Rights and Responsibilities**

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).

### **Information Literacy**

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC [Library Department](#) provides numerous [Information Literacy Tutorials](#) to assist students in this endeavor.

**Anticipated Class Schedule/Calendar**

|              | <b>SUBJECT</b>                  | <b>READINGS</b>          |
|--------------|---------------------------------|--------------------------|
| Feb 18 Tu    | Introduction                    |                          |
| 20 Th        | Earth and Sky Coordinates       | Unit 5                   |
| 25 Tu        | Annual Motion of the Sun        | Units 6, 7, and 9        |
| 27 Th        | The Reason for Seasons          | Units 6, 7, and 9        |
| Mar 3 Tu     | Phases of the Moon              | Unit 8                   |
| 5 Th         | Solar and Lunar Eclipses        | Unit 8                   |
| 10 Tu        | Early Astronomy                 | Unit 10                  |
| 12 Th        | Astronomical Revolution I       | Units 11 & 12            |
| 17 Tu        | Astronomical Revolution II      | Units 11 & 12            |
| 19 Th        | Solar System Overview           | Units 34 and 35          |
| <b>24 Tu</b> | <b>First Mid-Term Exam</b>      |                          |
|              | Planetarium EC                  |                          |
| 26 Th        | The Earth in Detail             | Unit 37                  |
| 31 Tu        | The Moon in Detail I            | Unit 39                  |
| Apr 2 Th     | II                              | Unit 39                  |
| 7 Tu         | Venus and the Greenhouse Effect | Unit 41                  |
| 9 Th         | The Outer Satellites            | Units 47 and 48          |
| 14 Tu        | <i>Spring Break</i>             |                          |
| 16 Th        | <i>Spring Break</i>             |                          |
| 21 Tu        | Pluto and Charon                | Units 48                 |
| 23 Th        | Light and Radiation             | Units 22, 23, 24, and 25 |
| 28 Tu        | Our Friend, the Sun             | Units 51, 52, and 53     |
| 30 Th        | <b>Second Mid-Term Exam</b>     |                          |
|              | Planetarium EC                  |                          |
| May 5 Tu     | Basic Properties of Stars       | Units 54, 56, 57 and 58  |
| 7 Th         | The H-R Diagram                 | Units 59, 60, and 62     |
| 12 Tu        | Death of Low-Mass Stars         | Units 63 and 65          |
| 14 Th        | Death of High-Mass Stars        | Units 67 and 68          |
| 19 Tu        | Black Holes                     | Unit 69                  |
| 21 Th        | Our Milky Way Galaxy            | Units 71, 72, and 73     |
| 26 Tu        | Dark Matter                     | Units 74 and 79          |
| 28 Th        | Cosmology                       | Units 77, 80, and 81     |
| June 2 Tu    | Cosmogony                       | Units 82, 83, and 84     |
| 4 Th         | <b>Third Mid-Term Exam</b>      |                          |
|              | Planetarium EC                  |                          |
| 9 Tu         | Final Exam Preparation          |                          |
| <b>11 Th</b> | <b>Final Exam</b>               |                          |