



**CAMOSUN COLLEGE**  
**School of Arts & Science**  
**Department of Physics & Astronomy**

**ASTRONOMY-102-002**  
**Astronomy: Stars and Galaxies**  
**Winter 2019**

**COURSE OUTLINE**

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The course description is online @ <http://camosun.ca/learn/calendar/current/web/astr.html>

\* Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

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**1. Instructor Information**

(a) Instructor	Dr. James Nemec
(b) Office hours	2:00-2:20 pm, Monday and Wed.; 1:40-2:20pm, Tuesday and Thursday
(c) Location	Fisher 340c
(d) Phone	250-370-3510                      Alternative: _____
(e) E-mail	<a href="mailto:nemec@camosun.ca">nemec@camosun.ca</a>
(f) Website	_____

**2. Intended Learning Outcomes**

*(If any changes are made to this part, then the Approved Course Description must also be changed and sent through the approval process.)*

Upon completion of this course the student will be able to:

1. Describe how the Sun works, its structure (interior, atmosphere, corona), its evolution and its future (as a red giant and then a white dwarf).
2. Outline the concepts of radiation (light) and energy, the different states of matter (solid, liquid, gas), and temperature scales.
3. Compare the properties of stars (single, binary and in clusters), including their distances, motions, temperatures (from spectra), masses, flux densities and luminosities.
4. Describe interstellar matter and the formation of stars from gas and dust.
5. Comment on the interiors and evolution of many different kinds of stars (such as red giants, planetary nebulae, novae, Cepheid and RR Lyrae variable stars, etc.) and why mass is the main factor controlling the evolution of stars.
6. Describe and explain the different kinds of stellar deaths and end-products, including supernovae, black holes, white dwarfs, and neutron stars.
7. Describe the Milky Way Galaxy, its contents, the massive black hole at its centre, and its evolution.
8. Describe the properties of the different kinds of galaxies, from ordinary elliptical and spiral galaxies to dwarf galaxies and quasars.
9. Outline ideas about the origin and evolution of the Universe.
10. Assemble experimental apparatus related to spectroscopy, analyze and interpret data to test astronomical hypotheses and complete written laboratory reports.

### 3. Required Materials

- (a) Textbook: The Cosmic Perspective, Bennett et al. 6<sup>th</sup>, 7<sup>th</sup> or 8<sup>th</sup> editions – most of the figures shown in the lectures will come from this book; another resource is the OpenStax Astronomy textbook (free from the internet)
- (b) Other: Pocket calculator
- (c) Lab package (available from the bookstore)

### 4. Course Content and Schedule

Midterm#1 on Tuesday, February 5, 2019

Midterm #2 on Tuesday, March 19, 2019

Final Exam in Exam period: April 15-26, 2019

### 5. Basis of Student Assessment (Weighting)

- (a) Assignments/Homeworks: these will be given at various times
- (b) Quizzes: Review quizzes will often be given. These will be marked immediately after doing the quiz. They will accepted for marking ONLY on the date given (unless other arrangements are made prior to the quiz).
- (c) Exams: Two midterm exams each count 15% toward the course grade, and a Final Exam counts 30% toward the course grade.
- (d) Labs (30%)
- (e) Other (e.g. Project, Attendance, Group Work):

### 6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

### 7. Recommended Materials to Assist Students to Succeed Throughout the Course

The textbook is on reserve in the Library

### 8. College Supports, Services and Policies



**Immediate, Urgent, or Emergency Support**

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

### College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

#### A. **GRADING SYSTEMS** <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

##### 1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	<u>B+</u>		<u>6</u>
73-76	<u>B</u>		<u>5</u>
70-72	<u>B-</u>		<u>4</u>
65-69	<u>C+</u>		<u>3</u>
60-64	<u>C</u>		<u>2</u>
50-59	<u>D</u>		<u>1</u>
0-49	F	Minimum level has not been achieved.	0

##### 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

## Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.