BOROUGH OF MANHATTAN COMMUNITY COLLEGE
The City University of New York
Department of Science

Title of Course: ASTRONOMY: GENERAL THEORY

Class Hours: 3

AST 108

Laboratory Hours per Week: 0

Semester:

Instructor Information:

Credits: 3

Course Description:
This course is an introductory survey course of topics in astronomical theory, especially for students who are not science-oriented. A selected number of basic topics in astronomy are carefully examined and interpreted. The relevance of the scientist and his/her work to the lives of non-scientists is continually examined.

Prerequisites: MAT 041 or MAT 051, ENG 088, ACR 094, ESL 062

Corequisites: AST 109

Course Student Learning Outcomes (Students will be able to...)

<table>
<thead>
<tr>
<th>Course Student Learning Outcomes (Students will be able to...)</th>
<th>Measurements (means of assessment for student learning outcomes listed in first column)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gather, interpret, and assess information from a variety of sources and points of view.</td>
<td>Graded homework assignments on the topics of planetary, stellar, galactic, extragalactic astronomy and others will measure the gathering, interpretation, and assessing of information and points of view from their textbook and online sources.</td>
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<tr>
<td>2. Evaluate evidence and arguments critically or analytically.</td>
<td>Graded homework assignments in planetary, stellar, galactic, extragalactic astronomy and others will measure how students evaluate evidence and arguments critically or analytically.</td>
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<tr>
<td>3. Produce well-reasoned written or oral arguments using evidence to support conclusions.</td>
<td>Graded research project on e.g. galaxy classification or other topic will measure how students produce well-reasoned written arguments using evidence to support conclusions.</td>
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<tr>
<td>4. Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world.</td>
<td>Graded homework and exam problems and questions on planetary, stellar, galactic, extragalactic astronomy and others will measure how students identify and apply the fundamental concepts and methods of astronomy.</td>
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</tbody>
</table>
This syllabus is provided as a general informational guide. Some of the information may vary depending on the specific course section and instructor. Different sections of the same course may require different textbooks. Verify the section specific textbook information in the CUNY’s Academic Course Schedule Web Page. Modifications of the grading system presented here will be communicated by the instructors of the sections when they meet the class.

5. Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.

Graded homework and exam problems and questions will include analysis of e.g. where to site a telescope; how to organize a classification system (of e.g. galaxies, stars or planets); how to determine the content of distant objects when no sample-return is possible (e.g. stars); etc.

6. Articulate and evaluate the empirical evidence supporting a scientific or formal theory.

Graded research project on e.g. galaxy classification or other topic will require students to enumerate and evaluate the empirical evidence for the relevant theory.

Below are the college's general education learning outcomes, the outcomes that are checked in the left-hand column indicate goals that will be covered and assessed in this course.

<table>
<thead>
<tr>
<th>General Education Learning Outcomes:</th>
<th>Measurements (means of assessment for general education goals listed in first column):</th>
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</thead>
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<tr>
<td>Communication Skills- Students will be able to write, read, listen and speak critically and effectively.</td>
<td>Lab write-ups, and/or homework, and/or exams</td>
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<tr>
<td>Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.</td>
<td>Lab write-ups, and/or homework, and/or exams</td>
</tr>
<tr>
<td>Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.</td>
<td>Lab write-ups, and/or homework, and/or exams</td>
</tr>
</tbody>
</table>

 Required Text:
Title: THE ESSENTIAL COSMIC PERSPECTIVE, 8th Edition
Authors: Bennett, Donahue, Schneider, Voit
Publisher: Pearson
0-13-444643-7

Other Resources:

Use of Technology (If Applicable):

Evaluation and Requirements of Students:
Homework/quizzes:20%
Research project:20%
Exams:60%
Total:100%
Class Participation
Participation in the academic activity of each course is a significant component of the learning process and plays a major role in determining overall student academic achievement. Academic activities may include, but are not limited to, attending class, submitting assignments, engaging in in-class or online activities, taking exams, and/or participating in group work. Each instructor has the right to establish their own class participation policy, and it is each student’s responsibility to be familiar with and follow the participation policies for each course.

BMCC Mask Mandate Policy for In-Person Classes
CUNY has put in place a temporary mask mandate policy that requires the wearing of masks indoors in all campus buildings. See: https://www.cuny.edu/coronavirus/university-updates/clarity-new-mask/

Face masks help prevent the spread of COVID-19. As it is possible to have or carry the coronavirus without having or showing symptoms, it is necessary for every person in our community to wear a mask even if you are fully vaccinated and/or have tested negative for COVID19, or think you are completely healthy. For appropriate/acceptable masks and guidelines on use, see CDC guidelines at: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html.

While the mask mandate is in effect, the following will apply to all in-person classes (including in-person classes associated with hybrid courses):

- In a classroom, if a fully vaccinated instructor is teaching a class and can maintain social distance from all others in the classroom, he/she may choose not to wear a mask (subject to any additional Department guidelines regarding the use of face shields or other layers of protection).
- Students who attempt to enter a classroom without wearing masks will be asked by the instructor to put on their masks before entering. Students who remove their masks during a class session will be asked by the instructor to put on their masks. Masks will be available for distribution for those who need one.
- Students may remove their masks momentarily during class (to drink something quickly), in classrooms other than labs, but must replace their masks immediately after that. The consumption of food is not permitted in any classroom or lab.
- Students who are not fully vaccinated are also required to maintain social distancing between themselves and all others in a classroom.

BMCC Policy on Plagiarism and Academic Integrity Statement
Plagiarism is the presentation of someone else’s ideas, words or artistic, scientific, or technical work as one’s own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are
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unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC’s Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).

FREE BMCC STUDENT SUPPORT SERVICES

BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

Advocacy and Resource Center (ARC) https://www.bmcc.cuny.edu/student-affairs/arc/ room S230, 212-220-8195, arc@bmcc.cuny.edu. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, contact the Advocacy and Resource Center (formerly Single Stop) for assistance. Please contact us at arc@bmcc.cuny.edu, call 212-220-8195, or come by the office at room S230. You may also contact the Office of Student Affairs, S350, 212-220-8130, studentaffairs@bmcc.cuny.edu, for assistance.

Counseling Center www.bmcc.cuny.edu/counseling, room S343, 212-220-8140, counselingcenter@bmcc.cuny.edu. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

Office of Compliance and Diversity https://www.bmcc.cuny.edu/about-bmcc/compliance-diversity, room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email olevy@bmcc.cuny.edu, or twade@bmcc.cuny.edu. If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

Office of Accessibility www.bmcc.cuny.edu/accessibility, Students who need academic accommodations in connection with a disability must initiate the request with BMCC’s Office of Accessibility (OA). Students need to register with the Office of Accessibility in order to officially disclose their disability status to the College and to determine eligibility for appropriate reasonable accommodations (including any prior IEPs or 504s). Please contact the OA at the start of the semester (or as soon as possible) to coordinate any accommodation request/s: www.bmcc.cuny.edu/accessibility, Room N360 (accessible entrance: 77 Harrison Street), 212-220-8180, accessibility@bmcc.cuny.edu.
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<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTERS</th>
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</table>
| 1    | A Modern View of the Universe  
Discovering the Universe for Yourself                          | 1, 2     |
| 2    | The Science of Astronomy  
Understanding Motion, Energy and Gravity   | 3, 4     |
| 3    | Light: The Cosmic Messenger                                             | 5        |
| 4    | Formation of Planetary Systems: Our Solar System and Beyond          | 6        |
| 5    | Earth and the Terrestrial Worlds                                        | 7        |
| 6    | Jovian Planet Systems                                                   | 8        |
| 7    | Asteroids, Comets, and Dwarf Planets: Their Nature, Orbits, and Impacts | 9        |
| 8    | Our Star - The Sun                                                      | 11       |
| 9    | Surveying the Stars                                                     | 12       |
| 10   | Star Stuff                                                              | 13       |
| 11   | The Bizarre Stellar Graveyard                                           | 14       |
| 12   | Our Galaxy - The Milky Way                                             | 15       |
| 13   | A Universe of Galaxies                                                  | 16       |
| 14   | The Birth of the Universe  
Dark Matter, Dark Energy, and the Fate of the Universe | 17, 18  |
| 15   | **Finals Week**                                                        |          |