Introduction to Problem-Solving and Logical Thinking

for Pre-Medical Post-Baccalaureates

Fall 2019

Course Instructor
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Course Information
Course Name: Introduction to Problem-Solving and Logical Thinking
Course Number: Chem 1055
Number of credits: 1 credit
Co-requisite or pre-requisite, if any: Student must be in the Post Baccalaureate Pre-Health Program
Class meeting days and times: Tuesday 12:30 – 1:20 PM
Class location: Tuttleman 303AB

Course Goal:
The goal of this course is for you to learn how to apply good problem-solving techniques and basic principles of deductive and inductive logic to test questions.

Course Description:
Welcome to Introduction to Problem-Solving and Logical Thinking. The ability to solve problems and think logically is essential for success in health profession schools because health professionals must be able to put together patient symptoms, test results, and current research to determine the best course of action for the patient in question. Because of this, entrance exams for health professions schools test a student’s ability to think and solve problems logically. However, the techniques of good problem-solving are rarely explicitly taught at any point in a student’s education, and science majors rarely take logic courses. This course seeks to fill that gap in a way that is specifically geared toward what pre-health students need to succeed in their classes and on standardized tests. This course teaches you good problem-solving techniques and the basics of deductive and inductive logic. You will spend class time practicing and applying these techniques and principles either individually or in pairs/groups. This design will enable you to develop your skills of problem-solving and logical thinking so that you can later apply them to not only your current classes, but also to entrance exams for professional school and the practice of your profession as well.
Course Objectives:

By successfully completing this course, you will be able to:

1. describe and apply good problem-solving techniques to a wide variety of problems
2. explain the difference between deductive and inductive reasoning
3. solve hypothetical syllogisms and identify necessary vs. sufficient conditions
4. use Venn diagrams to solve deductive syllogisms
5. explain and identify some common informal logical fallacies

Course Materials:


Please Note: We will be using this book frequently in class, so you must purchase it and you must bring it to class on days indicated in the syllabus schedule. Feel free to purchase a used copy as long as there is no writing in it.

Selections from other texts will be posted to Canvas.

Course Resources:

Canvas Learning Management System: This course uses the Canvas Learning Management System which can be accessed at: www.canvas.temple.edu (Links to an external site.) The syllabus and supplemental reading selections will be posted on Canvas. You will submit assignments on Canvas, and grades will be posted on Canvas. Announcements will be sent out through Canvas or by email.

AdaptPrep: This is an online resource that provides practice MCAT passages and questions. The system is made so that the level of difficulty of each section test is adjusted based on your score on the previous section test. This enables you to build your comprehension and reasoning skills as you move from easier questions to more difficult questions. While the system is labeled MCAT practice, the passages and questions are also beneficial for DAT, GRE, and PCAT preparation. As part of this course, you will be assigned to take 3 Critical Analysis and Reasoning Section (“CARS”) section tests on AdaptPrep so you can practice applying some of the logic skills learned in this class to standardized test reading questions.
Course Format:

This course is a workshop-style class. There will be some instructional presentations, but the much of your class time will be spent practicing the techniques and principles you learn by solving practice problems. You will sometimes work problems individually, but most of the time you will be working in pairs using the “Thinking Aloud Pair Problem Solving” method proposed by Whimbey et al. in your textbook. This method will be explained in more detail in the second class.

Evaluations of Learning:

Class Participation: Because this class focuses on your thought process, it involves a lot of in-class partner practice, so it is important that you attend every class. You should bring your book on the days marked in the schedule. Class participation will count for 30% of your final grade.

Application Assignments: The problem-solving techniques you learn in this class should apply to other areas of your life, specifically your other classes and standardized tests. These two assignments allows you to show where else you are applying these techniques.

Quizzes: There will be two logic quizzes during this class.

AdaptPrep Section Tests: You are required to complete 3 Critical Analysis and Reasoning Section (“CARS”) section tests on AdaptPrep. The due dates are listed on the schedule at the end of the syllabus.

Self-Recording: You will be assigned a specific problem, and you will record yourself thinking aloud as you solve the problem and upload it to Canvas. Your submission should show evidence of using all four of the problem-solving techniques taught in class. You are free to re-record until you are satisfied with your recording. This allows you to critique yourself and notice where you need to improve.

Post-Test: On the first day of class you will be given a pre-test. The number of questions you got right will be recorded. During the final exam, you will be given a post-test and the number of questions you got right will be recorded. You will be graded on improvement between the two tests.

Course Policies

Academic Honesty:
As future professionals, you will be held to the highest ethical standards in this class. Academic dishonesty (cheating or plagiarism) will not be tolerated. Students in this class are held to the standards and policies outlined in “Student Responsibilities” in the Temple University Bulletin 2018-2019 (https://bulletin.temple.edu/undergraduate/about-temple-university/student-responsibilities/) and the Student Conduct Code (https://www.temple.edu/secretary/sites/secretary/files/policies/03.70.12.pdf)

“The penalty for academic dishonesty can vary from receiving a reprimand and a failing grade for a particular assignment, to a failing grade in the course, to suspension or expulsion from the university. The penalty varies with the nature of the offense, the individual instructor, the department, the school or college, and the Office of Student Conduct and Community Standards.”

Classroom Behavior:

As future professionals, you are expected to treat your classmates and the instructor with respect and civility. Disrespectful actions or language will not be tolerated.

Grading Policy:

Class Participation 30 points
Application Assignments 10 points (2 assignments worth 5 points each)
Quizzes 20 points (2 quizzes worth 10 points each)
AdaptPrep 30 points (3 section tests worth 10 points each)
Self-Recording 5 points
Post-Test 5 points
Total: 100 points

Final letter grades for the course will be assigned as follows:
A 92.50% and higher
A- 90.00% - 92.49%
B+  87.50% - 89.99%
B   82.50% - 87.49%
B-  80.00% - 82.49%
C+  77.50% - 79.99%
C   72.50% - 77.49%
C-  70.00% - 72.49%
D+  67.50% - 69.99%
D   62.50% - 67.49%
D-  60.00% - 62.49%
F   59.99% and below

Any questions or concerns about your final grade should be directed first to the instructor and then to the Program Director.

Late Assignment Policy:

Assignments are due at 11:59PM on the date listed. If the assignment is turned in within 24 hours after the deadline, one point will be deducted from the final assignment score. If the assignment is turned in within 48 hours after the deadline, two points will be deducted from the final assignment score, etc. (one point deducted per 24-hour period after). No late assignments will be accepted after 11:59PM on the day before the final exam unless there are extenuating circumstances and arrangements have been made in advance.

Attendance and Tardiness Policy:

You are expected to attend every class, take notes, and participate in class exercises. Please do not come to class late as it distracts your classmates and you may miss important announcements or content. The instructor is not responsible for announcements or content you missed due to tardiness or absence.

You are allowed one unexcused absence, no questions asked, without it affecting your Class Participation grade. Beyond the first unexcused absence, you will lose 3 points from the total Class Participation grade for each unexcused absence, so please use your one unexcused absence
wisely. Arriving after 50% of the class is over will also count as an absence. Excused absences will not affect your Class Participation points. Please see “Make-Up Policy” for more information on excused absences.

Quiz/Exam Policy:

All quizzes/exams are required of all students. The quiz/exam dates are listed in the schedule at the end of this syllabus so you can plan accordingly.

Quizzes are given at the beginning of class. Please be on time as the quiz will be given at the beginning of class. You will have a limited amount of time to complete the quiz. If you arrive after the quiz starts, you will not be given additional time unless you have an excused reason for being late. If you arrive after the quiz has been collected, you will receive a zero for the quiz unless you have an excused reason for being late.

Quizzes/exams must be taken at the scheduled time in the scheduled room unless accommodations have been granted through Disability Resources and Services or you have an excused absence. All students are expected to take each quiz/exam only once—no retests will be granted.

If you indicate more than one answer for a question, or the indicated answer for a question is not clear/legible, you will receive 0 points for that question.

Make-Up Policy:

Class Participation: This grade cannot be made up. You will not lose points for excused absences. However, I suggest you get the missed notes from a classmate and do the exercises you missed because the material may be on a quiz and/or will help you improve your skills.

Quizzes/Exam: An unexcused absence for a quiz or exam will result in a score of 0 for that quiz exam. If you are unable to take a quiz/exam as scheduled due to an excused absence the day of the quiz/exam, it is your responsibility to contact the instructor at least a week ahead of the scheduled quiz/exam with appropriate documentation regarding the conflict to arrange a time for you to take the quiz/exam prior to the scheduled date. The instructor reserves the right to determine what reasons are considered excused. If your absence is due to an unforeseen emergency that does not allow you to contact the instructor before the exam, you must inform the instructor at or before the next class you attend. You must provide appropriate documentation of the emergency before you will be allowed to take the make-up quiz/exam, and you will be expected to take the quiz/exam within 48 hours of returning to class. If any of these requirements are not met, you will receive a score of 0 for the quiz/exam. If you have any questions regarding what constitutes appropriate documentation, please ask the instructor.
Examples of reasons that qualify for excused absence: illness, hospitalization, illness of a dependent, death or serious illness of family member, religious holiday, or absence covered by a disability accommodation (only as documented on an official letter from DRS.)

Incomplete Grade Policy:

Incomplete grades will be granted only in rare circumstances. Incompletes will be handled in accordance with university policy.

Extra Credit Policy:

You will have the opportunity for one extra credit assignment worth 5 points. This involves going through one of the AdaptPrep section tests you took and making a notation of why you missed each of the questions you got wrong. Instructions will be posted to Canvas. Extra credit is due December 3, 2019 at 11:59pm. There will also be a few extra credit questions on each quiz.

Use of Electronic Devices in Class:

You are expected to behave in a professional manner during class which includes paying attention to the instructor and not doing something else on an electronic device. Additionally, your computer screen can be distracting to others sitting behind you in class. You may only use an electronic device in class for note-taking.

Disability Disclosure Statement:

I want every student to be successful in this course, and I am happy to support you. Any student who has a need for accommodation based on the impact of a documented disability, including special accommodations for access to technology resources and electronic instructional materials required for the course, should first contact Disability Resources and Services (DRS) at 215-204-1280 in 100 Ritter Annex as soon as possible to learn more about the resources available to you. Next, the student should contact me privately to discuss the specific situation by the end of the first week of classes and provide a letter of documentation from DRS as soon as possible. I will work to coordinate reasonable accommodations for all students with documented disabilities. Please note that I need an official letter from DRS in order to grant accommodations.

Student and Faculty Academic Rights and Responsibilities:
Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty and Academic Rights and Responsibilities (Policy #03.70.02) which can be accessed through the following link: http://policies (Links to an external site.)Links to an external site. temple. edu/getdoc.asp ?policy_no=03. 70. 02.

**Technology Usage Policy:**

Read Temple University’s Technology Usage policy which includes information on unauthorized access, disclosure of passwords, and sharing of accounts. You are responsible for adhering to this policy. The Temple University Technology Usage Policy (Links to an external site.)Links to an external site. can be accessed at http://policies.temple.edu/PDF/84.pdf (Links to an external site.)Links to an external site.
Course Schedule:

Note: This schedule may be modified in the case of unforeseen circumstances. In the case of a change in the schedule, the students will be notified as soon as possible.

<table>
<thead>
<tr>
<th>Date</th>
<th>Class Content</th>
<th>Notes</th>
<th>Assignments Due/Quizzes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 27</td>
<td>Review Syllabus; Take pre-test</td>
<td></td>
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<tr>
<td>Sep 3</td>
<td><strong>Introducing Problem-Solving Techniques</strong></td>
<td>Bring Book</td>
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<tr>
<td>Sep 10</td>
<td>Ch. 4 Verbal Reasoning Problems</td>
<td>Bring Book</td>
<td></td>
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<tr>
<td>Sep 17</td>
<td>Ch. 4: Verbal Reasoning Problems &amp; Ch. 11: Mathematical Word Problems</td>
<td>Bring Book</td>
<td>Application Assignment #1 Due</td>
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<tr>
<td>Sep 24</td>
<td>Classification and Definitions</td>
<td></td>
<td>AdaptPrep CARS Section Test #1 Due</td>
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<td>Oct 1</td>
<td>Informal Logical Fallacies</td>
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<tr>
<td>Oct 8</td>
<td>Informal Logical Fallacies cont'd</td>
<td></td>
<td>Application Assignment #2 Due</td>
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<tr>
<td>Oct 15</td>
<td>Fallacies Involving Statistics</td>
<td></td>
<td>AdaptPrep CARS Section Test #2 Due</td>
</tr>
<tr>
<td>Oct 22</td>
<td><strong>Introducing Deductive Reasoning</strong></td>
<td>Bring Book</td>
<td>Quiz: Informal Logical Fallacies</td>
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<tr>
<td>Oct 29</td>
<td>Hypothetical Propositions: Necessary vs. Sufficient Conditions</td>
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<td>Nov 5</td>
<td>Hypothetical Syllogisms</td>
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<tr>
<td>Nov 12</td>
<td>Ch. 10 Deductive Reasoning and Days of the Week</td>
<td>Bring Book</td>
<td>AdaptPrep CARS Section Test #3 Due</td>
</tr>
<tr>
<td>Nov 19</td>
<td><strong>Introducing Inductive Reasoning</strong></td>
<td>Bring Book</td>
<td>Quiz: Necessary vs. Sufficient Conditions</td>
</tr>
<tr>
<td>Dec 3</td>
<td>Inductive Reasoning: How to Solve Analogies Ch. 6-8</td>
<td>Bring Book</td>
<td>Self-Recording Due; Extra Credit Due</td>
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<tr>
<td>Dec 12</td>
<td><strong>FINAL EXAM</strong></td>
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<td>Post-Test</td>
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