**PHIL 21002-002: INTRODUCTION TO FORMAL LOGIC (FALL 2015, M/W 2:15-3:30PM)**

**PROFESSOR:** David Pereplyotchik  
**EMAIL:** dpereply@kent.edu  
**OFFICE PHONE:** 330.672.0270  
**OFFICE LOCATION:** Bowman Hall, 320, Room N  
**PRIMARY OFFICE HOURS:** Tuesday, 1-6pm (see below for more options)

**REQUIRED TEXT:** Douglas Hofstadter, *Gödel, Escher, and Bach: An Eternal Golden Braid* (any edition)  

**APLIA:** Aside from the Hofstadter book, the readings will all be available online through the course management system, Aplia. You are *not* required (or advised) to buy a “physical” copy of book. For those who would prefer to own a physical copy, it is sold through Aplia for a reduced price.

Because *Aplia* forwards vital course information to your email inbox, it is very important that you provide the system with your *primary* email address from the very start.

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**COURSE DESCRIPTION**

Formal logic provides us with the resources to describe certain kinds of arguments or inferences with mathematical precision. It also gives us explicit methods for evaluating whether, and to what extent, such arguments are good or a bad—i.e., whether the main point of an argument (often called the *conclusion*) is effectively supported by the background supporting claims (often called *premises*). Mastery of formal logic contributes to effective and persuasive reasoning, not only in philosophy, but in any discipline. The skills that you acquire in this course are, therefore, applicable in any setting—academic, legal, or commercial.

Our goals for this semester include developing strategies for translating sentences of a natural language, English, into a variety of artificial languages (“formal systems”), including the languages of *propositional logic* and *quantificational logic*. Along the way, we will encounter a variety of issues concerning linguistic meaning and some techniques for translating and interpreting other people’s speech and text. We will also introduce the concept of a *proof procedure* and delve into the mechanics of formal proofs.

Throughout the course, we will often touch upon issues from closely related branches of philosophy—especially philosophy of language and philosophy of mind. The primary material concerning formal logic will be supplemented by discussions of artificial intelligence and the famous metamathematical results of Kurt Gödel. These topics will be drawn from the classic book, *Gödel, Escher, and Bach*.

By the end of the semester, successful students will have acquired a strong background in topics that are central to philosophy, psychology, law, linguistics, mathematics, and computer science. I will not presume that students in this course have had prior any experience in any of these fields, but those with advanced knowledge in any of them will find some of the material in this course familiar. I encourage you to pursue further inquiry in logic and in these areas, using the concepts and techniques that you learn in this course.

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**ASSIGNMENTS AND GRADING**

**Reading**

There will be assigned reading for every class session. It will be announced in class and sometimes by email. Feel free to read ahead, but remember to note any questions or comments you have regarding the reading. I have selected the readings with an eye toward keeping them manageable, by which I mean roughly 1-2 hours of reading between weekday sessions and approximately 2-3 hours during the weekends. The first few assignments will give you a rough idea of the workload.
Practice Problems for Homework: 30% of the final grade

Our textbook in this course is supplemented by an interactive online system, called Aplia. This will be your primary way of completing homework assignments. The system contains practice problems, which will be assigned after every class session. You will have three opportunities to answer each type of question. In the event that you enter an incorrect answer, the system will let you know and will offer targeted suggestions, advice, hints, and other helpful tools for successfully answering that type of question in your next attempt. Your grade will be determined by your best performance on each type of question, not the average of your three attempts. Indeed, I will not be able to see in my online gradebook how many attempts you had made.

Selected practice problems will be discussed in class. Students who show interest in the course material by volunteering to do practice problems out loud or on the board will significantly improve their final grades.

Three Exams: 30% of the final grade

There will be 3 exams throughout the semester, including the final exam. All exams are cumulative; each contains material from earlier in the semester. The format and general content of each exam will be announced well in advance, and detailed review sheets will be provided.

Five Quizzes: 10% of the final grade

There will be 5 very short quizzes throughout the semester. These quizzes will not be announced. They will take place at the outset of a class session and last for approximately 10-15 minutes. The quizzes are designed to make sure that everyone is keeping up with the readings.

Final Paper: 20% of the final grade

Toward the end of the semester, you will be asked to submit an essay on a topic of your choice, pertaining to the book, Gödel, Escher, and Bach. Several weeks prior to the due date, I will provide instructions for writing this paper, as well as some general guidelines on how to write papers of this type. You will be asked to meet with me in person to discuss your topic, your thesis statement, and any supplementary sources.

Class Participation (10% of the final grade)

Class participation consists in being active in the classroom—asking questions and making comments that demonstrate a grasp of the course material and an interest in the topics. Although attendance is required, it does not count as class participation. I think of participation as a kind of intellectual investment in the course, which goes beyond simply completing the assignments and showing up to class. No student can receive an A in the course without engaging actively in the class sessions. Limited class participation credit can also be earned by discussing course-related topics with me by email or at office hours.

To make the class participation grade as objective as possible, you will be asked to write down some keywords from your contribution to the class discussion at the end of each class session.

The following provides a translation from the numerical score to a letter grade:

<table>
<thead>
<tr>
<th>Numerical Score</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>96-100</td>
<td>A</td>
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<tr>
<td>86-90</td>
<td>B+</td>
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<tr>
<td>71-75</td>
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<td>66-70</td>
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<tr>
<td>61-65</td>
<td>D</td>
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<tr>
<td>56-60</td>
<td>B</td>
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<tr>
<td>55 or below</td>
<td>F</td>
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<tr>
<td>76-80</td>
<td>B-</td>
</tr>
<tr>
<td>61-65</td>
<td>C-</td>
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</tbody>
</table>

There is no “curve” for the course. This means that you are not in competition with your classmates for high grades. It is conceivable—though exceedingly unlikely—that everyone in the course will receive an A. Or a D.

When you receive your final grade for the course, please note that it is non-negotiable. I will not change grades under any circumstances, unless I have made a demonstrable clerical error in my calculations.
Attendance

Attendance is mandatory; having more than 2 absences or lateness will negatively impact your final grade in the course. Students who exceed 5 absences will automatically fail the course. A sign-in sheet will be passed around at the beginning of each class session. All students are expected to come to class on time and to be engaged for the length of the class session. Students who are absent from class for religious reasons or due to documented medical treatment will not incur any penalty on their final grade, but are nevertheless responsible for all required reading and assignments.

General Etiquette

• Please silence your cell phone (or, better yet, turn it off entirely) prior to entering the classroom. Do not use it during class for anything. This includes text messaging and taking notes. Leave your phone in your bag. If your phone rings—especially if your ringtone is some cheesy R&B club hit—you’ll not only disturb the class, but you’ll also look silly in front of everyone. If this happens more than once, I will lower your final grade by 2%. If cell phones become a more general nuisance, I will be forced to ask all students to deposit their phones into a basket at the beginning of each class session.

• Laptops are permitted in class, but solely for the purpose of taking notes. If I find that you are using your laptop for any other purpose (as is typically obvious), I will ask you never to use your laptop in the classroom. Having a laptop in the classroom is not a right; it’s a privilege. Use it responsibly.

• If the classroom has plenty of open seating, avoid sitting in the back of the room. (The first day doesn’t count.) If you decide to sit there, try especially hard to avoid falling asleep, talking to other students during the class session, using your phone or your computer, etc.

• Please do not come into the classroom late. It’s distracting and extremely disrespectful. Make it to class on time. If you do happen to come into the classroom late, please find the seat closest to the door, and move to it quietly and respectfully, without disturbing the ongoing lecture or discussion. Also, please do not have your headphones on when entering the room late, as this demonstrates a complete lack of respect for your peers and your instructor.

• Please do not fall asleep in class. If you need to sleep, please leave the classroom.

• Please treat your email correspondences with me as professionally as possible. Make sure to include your full name in the body of the email. Write in grammatical English sentences, separated into paragraphs where necessary. I do not want to see any of the following in your email: ‘LOL’, ‘plz’ (instead of ‘please’), ‘2’ (instead of ‘to’ or ‘too’), ‘u’ (instead of ‘you’), ‘r’ (instead of ‘are’), ‘your’ (instead of ‘you’re’, or vice versa), multiple question marks at the end of a sentence, multiple exclamation points at the end of a sentence, multiple consecutive commas anywhere in the email, unnecessary quotation marks, advertisements, entire paragraphs written in ALL CAPS, entire paragraphs written in italics, and so on.

• Please do not “reply-all” to any mass mails that I send to the entire class. If you need to email me directly, please start a brand new private email thread between you and me.

• Repeated failure to abide by any of these policies will result in a decrease in your final grade, typically by 2% per violation. If your grade is lowered in this manner, you will be informed by email or in person.

Office Hours and Availability

As noted above, my primary office hours are on Tuesdays, 1-6pm. However, many other options are available. If you want to meet with me at some other time, let me know and we can try to arrange it. If you prefer to meet somewhere on campus other than my office, let me know and we’ll see what we can work out. (It won’t always be possible, of course.) In general, I’m quite flexible; my only hard and fast rule is that I cannot meet with you on the weekends.
Needless to say, I can be reached by email at any time. I will do my best to respond to your emails as quickly as possible. Sometimes I will reply to your message immediately, even at odd hours, like 4am. However, please do not assume that this is always possible; there is great variability. Occasionally, I will not have access to email or will not be able to answer your query for up to several days. In such cases, please be patient.

There are many other means of contacting me, including Skype, GoogleChat, iChat, and the like. I am open to all of these options, if you prefer to use them.

**Plagiarism, Cheating, and other forms of Academic Dishonesty**

Please note that I do not tolerate academic dishonesty in any form. I take a strict stance on this. Be aware that I will dole out maximum penalties for violations, including assigning failing grades and pushing for suspension and/or expulsion from Kent State. If you are unclear on what constitutes plagiarism or academic dishonesty, please make it your business to learn about this immediately. Ignorance of university policy will not be accepted as an excuse. University policy 3-01.8 deals specifically with the problem of academic dishonesty. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the following URL:

http://www.kent.edu/policyreg/policydetails.cfm?customel_datapageid_1976529=2037779

**Information for Students with Documented Disabilities**

University policy 3-01.3 requires that students with documented disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact me at the beginning of the semester to make arrangements for necessary adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services, which can be reached at 330-672-3391 or www.kent.edu/sas

**Registration and Withdrawal Deadlines**

University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashLine) prior to the deadline indicated. Registration errors must be corrected prior to the deadline. The official registration deadlines for this course can be found by doing a Detailed Class Search from the Schedule of Classes found at:


**Email agreement**

Please send me an email **before our next meeting**, which includes a statement to the effect that you have read this syllabus and that you agree to abide by the policies that it sets out. Please also include evidence that you have signed up for Aplia. (You don’t need to pay the registration fee immediately; they give you a 2-week grace period.) Feel free to ask me questions in your email, and to provide any extra information that would help me get to know you.
COURSE SCHEDULE

The following schedule is only a rough approximation. For a detailed and up-to-date schedule, please consult the Course Outline on Aplia. The Aplia Course Outline will be updated periodically, and I will announce all changes in class and by email. Note also that the exams and review sessions will be announced two weeks in advance.

WEEK 1: INTRODUCTION

Reading: Hurley §1.1 and §1.2

Basic Concepts: Logic, Argument, Premise, Conclusion

Supplementary Topics: The value and purpose of studying logic
The relation between logic and other academic fields

WEEK 2: THE BASIC CONCEPTS OF LOGIC

Reading: Hurley §1.3, §1.4, and 1.6

Basic Concepts: Argument Structure, Deduction, Induction, Truth, Validity, Soundness, Strength, and Cogency

Supplementary Topic: Effective Argumentative Writing, Thesis Statements, Organization

WEEK 3: PROPOSITIONAL LOGIC

Reading: Hurley §6.1

Main Topics: Formal Systems, Artificial Languages, Translation

Exam 1

WEEK 4: TRUTH FUNCTIONS AND TRUTH TABLES

Reading: Hurley §6.2-6.4

Topics: Truth Functions, Truth Tables, Sentences, Consistency, Validity, Logical Truth

WEEK 5: NATURAL DEDUCTION IN PROPOSITIONAL LOGIC

Reading: Hurley §7.1

Topics: Rules of Implication, Rules of Replacement

Exam 2
**WEEK 6: NATURAL DEDUCTION IN PROPOSITIONAL LOGIC**

**Reading:** Hurley §7.2-7.4

**Topics:** Rules of Implication, Rules of Replacement

**WEEK 7: NATURAL DEDUCTION IN PROPOSITIONAL LOGIC**

**Reading:** Hurley §7.5-7.7

**Topics:** Conditional Proof, Indirect Proof, Proving Logical Truths

**WEEK 8: INTRODUCTION TO PREDICATE LOGIC**

**Reading:** Hurley §8.1 and 8.2

**Topics:** Quantifiers, Predicates, Singular Terms, and New Rules for Translation and Inference

**WEEK 9: NATURAL DEDUCTION IN PREDICATE LOGIC**

**Reading:** Hurley §8.3 and §8.4

**Topics:** The Quantifier Negation Rule, Conditional and Indirect Proof in Predicate Logic

**WEEK 10: NATURAL DEDUCTION IN PREDICATE LOGIC**

**Reading:** Hurley §8.6-8.7

**Topics:** Relational Predicates, Overlapping Quantifiers, Identity, Definite Descriptions

**WEEK 11:** Hofstadter, chs. 1-3

**WEEK 12:** Hofstadter, chs. 4-6

**WEEK 13:** Hofstadter, chs. 7-10

**WEEK 14:** Hofstadter, chs. 11-13

*Review for the final exam*

**FINAL PAPER DUE DATE:** Tuesday, December 15th, 11:59pm

**FINAL EXAM:** Friday, December 18th, 12:45-3pm, in the usual classroom