21:730:432:61   **FORMAL LOGIC**
SPRING, 2018   **RUTGERS UNIVERSITY**
INDEX 18893
INSTRUCTOR: DR. JEFF BUECHNER

(i.e., FORMAL LOGIC)

Course Description:

We will examine various logics for revising beliefs and changing theories—logics of belief revision and theory change. These logics are important tools for updating databases in computer science—databases of any kind: for example, internal security and privacy databases, Google and Facebook databases, exportable goods databases. But there are also important differences between files in a computer and its environment and beliefs in the head of a human being.

We will consider beliefs of any kind—beliefs about science (e.g., solid-state physics, computational biology, quantum computing), politics, business, economics, philosophy, life in general, culture, arts, entertainment. Similarly, we will consider theories of any kind—theories in the sciences, in business and economics, in politics, in philosophy. We will examine philosophical questions about the nature of belief (of any kind) and the nature of theories (of any kind). We will also consider beliefs of specific kinds (such as beliefs about mathematical objects, such as the counting numbers) and theories of specific kinds (such as theories about the nature of forces in physics and

theories in business about problems in supply chain management).

Is there a single logic of belief revision for all beliefs and is there a single logic of theory change for all theories, or are there different logics for different beliefs and different theories? Similarly, are there different logics of belief revision for different philosophical theories about the nature of belief and different logics of theory change for different philosophical theories of theory change or is there a single logic of belief revision for all philosophical theories of the nature of belief and a single logic of theory change for all philosophical theories of the nature of theories?

Course Requirements:

Mathematics majors: There are ten homework assignments, consisting of logic problems which you solve and hand in the week after they are assigned. You may work in groups to solve these problems. These count for 2/3 of your grade. The other 1/3 of your grade is attendance.

Non-mathematics majors: You will do a ten page paper on any topic relevant to this course. You must approve the topic with me before you begin work on it. You may work in groups. This counts as 2/3 of your grade. The other 1/3 of your grade is attendance.

I will e-mail you all papers that we will read and discuss in class. There is no text for this course, since there is no textbook yet available on the topics of this course. There is no final examination.

Course Outcomes:

What can you expect to come away with once you have finished this course? You will possess skills—the ability to do

proofs in sentence logic, predicate logic, and in several advanced extensions of these logics that are used to model reasoning processes in belief revision and theory change.

Moreover, you will acquire an ability to make your descriptions of things, events, processes, and ideas more precise. The precision is won easily—as most of the structures, concepts and ideas in logic require extraordinary precision in setting them out.

You will also acquire the ability to think abstractly—that is, to abstract away from inessential trappings and think about issues in terms of their essential components. The ability to think precisely will be helpful in all walks of life, most especially in professional areas.

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Plagiarism

Although issues about plagiarism will not arise in this course, you should be aware that plagiarism is a serious offense that can jeopardize your academic career at Rutgers and your future career as well. For more information, either consult the University Code of Student Conduct or visit the Student Judicial Affairs website http://judicialaffairs.rutgers.edu

ALL WORK

Must be completed before 11PM, Tuesday, May 8th.

NOTE: Anything turned in after that time will not be accepted.

Students with disabilities, please read the following:

Rutgers University welcomes students with disabilities into all of the University's
educational programs. In order to receive consideration for reasonable
accommodations, a student with a disability must contact the appropriate
disability
services office at the campus where you are officially enrolled, participate
in an
intake interview, and provide documentation:
https://ods.rutgers.edu/students/documentation-guidelines. If the
documentation
supports your request for reasonable accommodations, your campus's disability
services office will provide you with a Letter of Accommodations. Please
share this
letter with your instructors and discuss the accommodations with them as
early in
your courses as possible. To begin this process, please complete the
Registration
form on the ODS web site at: https://ods.rutgers.edu/students/registration-
form."