Department of Philosophy
Undergraduate Course Outline 2015-16
Philosophy 2251G: Conceptual Development of Mathematics

MWF 12.30-1.30 **Instructor: Professor John L. Bell**
UCC 63 **StH 4130** jbell@uwo.ca

Course Information

This course is a survey, at an elementary level, of some of the most important concepts of mathematics. Particular attention will be paid to their historical development and broader philosophical significance. Each of the various branches of mathematics will receive a separate discussion, buy their interdependence will be emphasized throughout. Topics may include Greek mathematics, algebra, geometry, the calculus. the theory of numbers, set theory and the philosophy of mathematics

Course objectives .

The goal of this course is to provide students with an overview of the development of mathematical concepts

Course Materials

Conceptual Development of Mathematics : Course notes available from bookstore

Methods of Evaluation

The grade will be evaluated on the basis of two essays and a final exam. The first essay will be due half-way through the semester on a date to be announced, and the second essay will be due on the last day of classes. Essays may only be submitted late if a good reason, acceptable to the instructor, is provided.

A good essay for this course should:

(i) contain some discussion of mathematical ideas, that is, it should *not* be just a list of dates, or purely biographical;
(ii) be interesting and comprehensible to the reader (and of course the writer); in particular, unnecessary technical jargon should be avoided;
(iii) give some indication that the writer understands the ideas involved;
(iv) be written essentially in the writer's own words – quotations from other sources should be clearly indicated and referenced;
(v) be 3000-4000 words in length.

Here are some possible essay topics:

1. The number π.
2. Euler.
3. Negative numbers and zero.
4. Gauss is sometimes described as the last mathematician to know everything in his subject. Is this not possible today?
5. Complex and imaginary numbers.
6. Squaring the circle.
7. To what extent can the Greeks be said to have anticipated the calculus?
8. According to Leibniz, "Taking mathematics from the beginning of the world to the time of Newton, what he has done is much the better half". Do you agree?
9. Did Newton and Leibniz "invent" the calculus?
10. Non-Euclidean geometry.
11. Cantor and the actual infinite in mathematics.
12. Is mathematics a science or an art, or both?
13. In all the records of ancient civilizations there is evidence of some preoccupation with arithmetic over and above the needs of everyday life. Discuss.
14. Mathematics in China and India.
15. The mathematics of the Islamic period.
16. Is mathematics discovered or invented?
17. Mathematics and the Divine.
18. What is the value of non-applicable mathematics?
19. Mathematics and logic.
20. The mathematics of chance.
21. Fractals in art.
22. Fermat's last theorem.
23. Mathematics and mathematicians in the French revolution.
24. Mathematics and music.
25. The calculus priority dispute: Newton vs. Leibniz.
26. The four-colour conjecture and its computer "proof".
27. Geometry and physics.
28. The uses of game theory.
29. The advantages of good mathematical notation.
30. Has the development of computers made it unnecessary for the "ordinary" person to understand basic mathematics.

Students are directed to view the Policy on Accommodation for Medical Illness (https://studentservices.uwo.ca/secure/index.cfm).

Policy on accommodation for medical illness of work worth less than 10% of the total

course grade. Medical documentation will be required; such documentation must be submitted by the student directly to the appropriate Faculty Dean's office and not to the instructor. It will be the Dean's office that will determine if accommodation is warranted.

Statement on Use of Electronic Devices.

No electronic devices will be allowed in the Final Exam

Policy on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf."

Support Services

Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

Statement on Use of Plagiarism Software

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com)."

Additional Links

- Registrarial Services (http://www.registrar.uwo.ca)
- Student Support Services (http://westernusc.ca/services/)