

SCIENCE 2B03: THE BIG QUESTIONS

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Science 2B03 is available for credit to any undergraduate at McMaster enrolled at Level II or higher, regardless of home faculty or program.

Instructors:

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Textbook: There is no textbook or Coursepack formally used or assigned to this course, thus nothing to buy. The LearnLink site (see below) has a wide variety of reading resources and links for background reading specifically useful for this course. However, it is important (even more than for a normal course) to be at lectures and make your own notes. We encourage you to talk with us, the TA's, and each other whenever you have specific questions.

A *LearnLink website* will be used throughout the term for posting schedules, information, assignments, links to other Websites for further reading, chat rooms, and communication links. Instructions on how to use it will be given at the beginning of term. The LearnLink site has all the detailed information for the inquiry groups, individual projects, and lots of links to reading resources in books and on the Web.

Tutorial periods: Once per week. Group sizes are intended to be 20-25 people each. They will be used as inquiry groups for discussion of the course material, follow-up research, and project presentations. Participation in weekly scheduled tutorials is a required part of the coursework.

Marking scheme: (see the LearnLink site for detailed explanations of each part)

30%	Final exam
12%	One mid-term test
27%	Group project and presentation
21%	Participation in tutorials (inquiry groups)
10%	Individual Learnlink journal

OUTLINE OF CURRICULUM

Prologue: Setting the Stage.

- What's out there? Things in the universe; planets, stars, galaxies
- The universe as a timeline: the "cosmic calendar" and turning points in its history
- The nature of space and time on large scales
- The nature of space and time on small scales

Act I: Origins

- The evolving universe: how things change with time, and how we can reconstruct the "history of everything"
- Uncovering the early universe: working backward to the Big Bang

Act II: Stars and Planets

- The formation of stars and planets. Our Galaxy as a place to live
- The lives of stars: stellar evolution and end states, including black holes
- The formation of the elements: how everything was made
- Planetary systems. The search for planets around other stars. What have we found? Expectations and surprises. Possibilities for finding Earth-like planets around other stars

Act III: Life

- *Why* is there life on Earth? Are we special?
- *What* is life? What is evolution?
- Origin of life on Earth as we know it. The conditions during the early history of the Earth
- What species are and what we look for in evolution
- What kinds of evidence can be used to discuss evolution?

Epilogue: End Games

- The multiverse: inflationary epoch, string theory
- The far future of the universe as we predict it today.

We also have scheduled *special guest lectures* on topics such as "Multiple Dimensions and Life in the Fourth Dimension", "When Galaxies Collide", "Supercontinents and Snowball Earth". These are part of the course curriculum, and happen about once per month.

Statement on Academic Integrity

McMaster Senate requires the following statement to be included in every course outline.

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at http://www.mcmaster.ca/senate/academic/ac_integrity.htm

The following illustrates only four forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own, or work for which other credit has been obtained through another course.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.
4. Failing to give appropriate credit or acknowledgement to other people's work in project presentations.