

**Grande Prairie Regional College**  
**Department of Science and Technology**

**Course Outline :** Genetics 2700 - Foundations of Molecular Genetics Winter 2005

**Description :** Genetics 2700 is a course dealing with the molecular genetics of prokaryotes. Basic concepts on the organization of genetic material and its expression will be developed from experiments on bacteria and viruses.

**Instructor :** Dr. Sean Irwin  
Office - J223  
Telephone - 539-2860 (office)  
                  - 567-2226 (home)

**Prerequisites :** BI 2070

**Required Text :** Fairbanks, D.J. and Andersen, W.R., Genetics: The Continuity of Life, International Thompson Publishing Company, New York, 1999.

Selected readings in Molecular Genetics

**Lectures :** Place : J202  
Time : Mon. 13:00-14:20  
          Fri. 11:30 – 12:50

**Seminar :** Place : J202  
Time : Tus. 14:30 – 15:50

|                     |                 |       |
|---------------------|-----------------|-------|
| <b>Evaluation :</b> | Quizzes         | - 15% |
|                     | Midterm Exam I  | - 20% |
|                     | Midterm Exam II | - 25% |
|                     | Final Exam      | - 40% |

Students are advised to attend all lectures and seminars as they will be responsible for all course material presented in the lectures and seminars.

**Office Hours :** Monday - 11:30 - 12:50 pm  
Tuesday - 11:30 - 12:50 pm  
Thursday - 11:30 - 12:50 pm

## GN 2700 Course Outline

|     | <u>Date</u> | <u>Topic</u>                             | <u>Text</u> |
|-----|-------------|------------------------------------------|-------------|
| 1.  | Jan. 6      | Introduction: Genetic Concepts           |             |
| 2.  | Jan. 10     | DNA Structure / The Central Dogma        | 2.2         |
| 3.  | Jan. 13     | Bacteria and Phage                       | 7.1-2, 7.7  |
| 4.  | Jan. 17     | T4 Genetic Analysis                      |             |
| 5.  | Jan. 20     | T4 Genetic Analysis                      | 16.6        |
| 6.  | Jan. 24     | Transformation                           | 7.4         |
| 7.  | Jan. 27     | Conjugation                              | 7.5         |
| 8.  | Jan. 31     | Transduction                             | 7.7-8       |
| 9.  | Feb. 3      | Transposition                            | 22.3        |
| 10. | Feb. 7      | Midterm I                                |             |
| 11. | Feb. 10     | DNA Replication                          | 2.4-5       |
| 12. | Feb. 14     | Mutation                                 | 5.1-3       |
|     | Feb. 17     | Family Day                               |             |
| 13. | Feb. 21     | Mutation                                 |             |
|     | Feb. 24     | Winter Break                             |             |
|     | Feb. 28     | Winter Break                             |             |
| 14. | Mar. 3      | Mutation                                 |             |
| 15. | Mar. 7      | DNA Repair                               | 5.4         |
| 16. | Mar. 10     | DNA Repair                               |             |
| 17. | Mar. 14     | Recombination                            | 7.3         |
| 18. | Mar. 17     | Midterm II                               |             |
| 19. | Mar. 21     | Recombination                            |             |
| 20. | Mar. 24     | Gene expression; <i>lac</i>              | 8.1-2       |
| 21. | Mar. 28     | Gene expression; <i>lac</i> , <i>trp</i> | 8.3         |
| 22. | Mar. 31     | Gene expression; Lambda                  | 8.4         |
| 23. | Apr. 4      | DNA cloning                              | 9.1-9.2     |
| 24. | Apr. 7      | DNA cloning                              | 9.3-9.4     |
| 25. | Apr. 11     | DNA sequencing, PCR                      | 9.6, 9.9    |
| 26. | Apr. 14     | Review                                   |             |

### GN 2700 Seminar Schedule

| Date    | Paper         | Subject                                 |
|---------|---------------|-----------------------------------------|
| Jan. 7  | 1.1           | DNA                                     |
| Jan. 14 | 2.1           | T4 Phage                                |
| Jan. 21 | 5.1           | Fine Structure Mapping                  |
| Jan. 28 | 15.2          | DNA Replication                         |
| Feb. 4  | 11.1, 13.1    | Mutagenesis                             |
| Feb. 11 | 11.2, 12.2    | The Genetic Code / Mutation             |
| Feb. 18 | 13.2          | DNA Repair                              |
| Feb. 25 | Winter Break. |                                         |
| Mar. 4  | 17.1          | Recombination                           |
| Mar. 11 | 23.1, 23.3    | The Lac Operon - Polarity               |
| Mar. 18 | 24.1, 24.2    | The Lac Operon – Promoters / Repressors |
| Mar. 25 | 6.3           | Restriction Enzymes                     |
| Apr. 1  | 8.2, 9.1      | DNA Cloning / Sequencing                |
| Apr. 8  | TBA           |                                         |

| Alpha Grade | Approximate Percentage |
|-------------|------------------------|
| A+          | 90 – 100               |
| A           | 85 – 89                |
| A-          | 80 – 84                |
| B+          | 76 – 79                |
| B           | 73 – 75                |
| B-          | 70 – 72                |
| C+          | 67 – 69                |
| C           | 64 – 66                |
| C-          | 60 – 63                |
| D+          | 55 – 59                |
| D           | 50 – 54                |
| F           | 0 – 49                 |