DEPARTMENT OF SCIENCE

COURSE OUTLINE – CS 1150 3(3-0-3)
ELEMENTARY DATA STRUCTURES

INSTRUCTOR: David Gregg **PHONE: (**780) 539-2976
OFFICE: C 427 **E-MAIL:** dgregg@gprc.ab.ca

OFFICE HOURS: TBA and by prior arranged appointment

PREREQUISITE(S)/CO-REQUISITE: CS 1140 is the prerequisite for this course. Note: CS 1000 is not a suitable prerequisite.

REQUIRED TEXT/RESOURCE MATERIALS:
Introduction to Java Programming by D. Liang. Please make good use of the on-line and library resources related to data structures also. See the CS1150 moodle page for additional materials.

CALENDAR DESCRIPTION:
The course provides a review of programming principles (specification, implementation and testing), and an extension of object-oriented concepts from CS1140 including data abstraction, modular program construction and program reuse. The emphasis is on dynamic data structures (e.g. lists, string, stacks, queues, tables), and their associated algorithms (e.g. recursion, traversal, sorting, searching, hashing).

CREDIT/CONTACT HOURS: 3(3-0-3) This course is 3 credits. The course consists of 3 lecture hours and 3 lab hours per week.

DELIVERY MODE(S): class-room.
When necessary, lab time will be utilized for lecturing on specific Java/algorithmic concepts and features. The remainder of lab time will generally be used as "hands-on" programming time. Student grades and course information (notes, assignments, announcements etc) will be posted on the GPRC moodle system (moodle.gprc.ab.ca).

OBJECTIVES (OPTIONAL):
After talking this course students should be able to:

- Analyse problems and design automated solutions to those problems using an object oriented computer language.
- Construct the common array based and linked data structures like: strings, stacks, queues, lists, trees, heaps and graphs.
- Describe and implement common algorithms related to searching, sorting, traversals, and hashing. (This includes algorithms that use recursion.)

TRANSFERABILITY:
UA, UC*, UL, AU, AF, CU, CUC, KUC. See the GPRC College Calendar and the Alberta Transfer Guide for detailed regarding the transferability of this course.

GRADING CRITERIA:

The following Grading Conversion chart will be used to convert final marks to letter grades.

GRANDE PRAIRIE REGIONAL COLLEGE
GRADING CONVERSION CHART

Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A+	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A–	3.7	80 – 84	FIRST CLASS STANDING
B+	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B–	2.7	70 – 72	
C+	2.3	67 – 69	SATISFACTORY
C	2.0	63 – 66	
C–	1.7	60 – 62	
D+	1.3	55 – 59	MINIMAL PASS
D	1.0	50 – 54	
F	0.0	0 – 49	FAIL
WF	0.0	0	FAIL, withdrawal after the deadline

EVALUATIONS:

Assignments	30%
Midterm Exam I	15%
Midterm Exam II	20%
Final Exam	35%

STUDENT RESPONSIBILITIES:

Assignments are to be handed in and/or demonstrated in the scheduled lab on the due-date. Late assignments will be penalized by 50%. Late assignments may not be accepted after the end of classes. Some assignments may be weighted differently than others. Students will be eligible for a passing grade, only if they obtain 35 out of a possible 70 marks (on exams).

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the Student Conduct section of the College Admission Guide at http://www.gprc.ab.ca/programs/calendar/ or the College Policy on Student Misconduct: Plagiarism and Cheating at www.gprc.ab.ca/about/administration/policies/ Note: all Academic and Administrative policies are available on the same page.

COURSE SCHEDULE/TENTATIVE TIMELINE:

Sequence	Topic
1	Introduction and Review
2	Strings and Files
3	Thinking in Objects
4	Inheritance and Polymorphism
5	Binary Search
6	Abstract Classes, Interfaces, and Object Oriented Design
7	Exception Handling
8	Midterm I
9	Array Based Lists and Stacks
10	Recursion
11	Algorithm Analysis and Sorting (n^2 and $n \log_2 n$)
12	Linked Lists
13	Stacks and Queues
14	Midterm II
15	Trees
16	The Heap
17	Hashing
18	Graphs
19	Generics and Iterators
20	Final Exam