MCR3U0 Course Summary (Mr. N. Nolfi)
Grade 11 Mathematics, Functions, University Preparation

Broad Objectives

Welcome to "MCR3U0, Functions, University Preparation." In this course, you will spend a great deal of your class time ***analyzing problems*** and ***developing solutions***. The broad objectives of this course are to help you to

- develop an ***understanding*** of ***mathematics*** as a ***language*** and a ***set of tools*** whose purpose is to ***explore*** and ***describe physical*** and ***conceptual RELATIONSHIPS***.
- learn to view mathematical relationships from a variety of different perspectives: ***algebraic***, ***geometric*** (e.g. graphical), ***physical*** (i.e. to model a "real world" phenomenon), ***verbal*** (i.e. in words), ***numerical*** (e.g. table of values)
- improve your ***problem solving skills*** and expand your repertoire of ***problem solving strategies***
- hone your ***communication skills*** through clear expression of mathematical solutions
- enhance your ability to **think** in a ***variety of different ways*** including both ***L-mode thinking***, the ***analytical*** and ***rational reasoning*** processes associated with the ***left*** hemisphere of the brain, and ***R-mode thinking***, the **creative** and ***imaginative*** (but not necessarily rational) thinking processes associated with the ***right*** hemisphere of the brain.
- improve your ability to ***work***, ***think*** and ***learn independently***

If you make a commitment to learning, by the end of the semester you will have achieved an unprecedented level of personal growth.

Mathematical Process Expectations

Throughout this course, students will:

Problem Solving	• develop, select, apply, compare, and adapt a variety of problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding;
Reasoning and Proving	• develop and apply reasoning skills (e.g., use of inductive reasoning, deductive reasoning, and counter-examples; construction of proofs) to make mathematical conjectures, assess conjectures, and justify conclusions, and plan and construct organized mathematical arguments;
Reflecting	• demonstrate that they are reflecting on and monitoring their thinking to help clarify their understanding as they complete an investigation or solve a problem (e.g., by assessing the effectiveness of strategies and processes used, by proposing alternative approaches, by judging the reasonableness of results, by verifying solutions);
Selecting Tools and Computational Strategies	• select and use a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems;
Connecting	• make connections among mathematical concepts and procedures, and relate mathematical ideas to situations or phenomena drawn from other contexts (e.g., other curriculum areas, daily life, current events, art and culture, sports);
Representing	• create a variety of representations of mathematical ideas (e.g., numeric, geometric, algebraic, graphical, pictorial representations; onscreen dynamic representations), connect and compare them, and select and apply the appropriate representations to solve problems;
Communicating	• communicate mathematical thinking orally, visually, and in writing, using precise mathematical vocabulary and a variety of appropriate representations, and observing mathematical conventions.

Course Overview

Unit 0 – Review of Critically Important Math Concepts

- What is Mathematics?
- Important Fundamental Concepts including Terminology
- Algebraic Concepts and Skills
- Mathematical Relationships including Linear/Quadratic
- Analytic Geometry
- Viewing Mathematical Relationships from a Variety of Perspectives (Algebraic, Geometric, Physical, Numeric)
- Elementary Principles of Logic

Unit 1 – Characteristics of Functions

- Representing Functions
- Solving Problems involving Linear and Quadratic Functions
- Determining Equivalent Algebraic Expressions

Unit 2 – Trigonometric Functions

- Determine and Apply Trigonometric Ratios
- Connect Graphs and Equations of Sinusoidal Functions
- Solve Problems involving Sinusoidal Functions

Unit 3 – Exponential Functions

- Representing Exponential Functions
- Graphs and Equations of Exponential Functions
- Solve Problems involving Exponential Functions

Unit 4 – Discrete Functions

- Arithmetic Sequences and Series
- Geometric Sequences and Series
- Financial Applications

Evaluation

Knowledge and Understanding (KU)	**25%**
Application (APP)	**20%**
Thinking, Inquiry and Problem Solving (TIPS)	**15%**
Communication (COM)	**10%**
Final Evaluation (11% KU, 8.6% APP, 6.4% TIPS, 4.3% COM)	**30%**

EVALUATION POLICY

Tests and other forms of in-class evaluations will always be announced ahead of time. Students who know that they will be absent for such an evaluation (e.g. field trips, school sports, appointments, etc.) should arrange ***in advance*** to write at an alternate time. Failure to do so may result in an incomplete evaluation. Students who are absent for legitimate reasons (e.g. illness, attending a funeral, family problems, etc.) but who have not arranged in advance to write at an alternate time may do so upon presentation of a note from a parent or guardian. All students are expected to complete all assignments! **Failing to complete assignments and other evaluations significantly increases the risk of failure!**

TERM EVALUATIONS

The evaluations during the term will consist mostly of tests and assignments. For both types of evaluations, the students will be asked to complete written work as well as to perform practical tasks using computer software and graphing calculators.

FINAL EVALUATIONS

The final set of evaluations for this course consists of ***two*** parts, one of which is a final culminating activity to be completed ***in class*** during the final weeks of classes. The second part is completed during the final evaluation period.

CHEATING ON EVALUATIONS AND SUBMITTING PLAGIARIZED WORK

The ***learning of the students*** is ***the reason*** for the existence of Ontario's public education system! Students who cheat accomplish ***nothing*** other than revealing their dishonesty and intellectual cowardice. Students who cheat are ***defeating themselves*** by failing to take advantage of learning opportunities! ***Therefore, in my class, cheating and plagiarism will not be tolerated!*** In addition to the strong possibility of disciplinary action, a mark of ***zero*** will be assigned for cheating or for plagiarism.

COURSE NOTES

Since this course was revised recently by the Ontario Ministry of Education, the available textbook does not correspond exactly to the new curriculum expectations. However, an extensive set of course notes can be obtained at www.misternolfi.com. To be successful in this course, ***all students must read the notes carefully and complete all activities***.

HOMEWORK

Daily practice is an essential element required for the development of proficiency in mathematics. Given that this is a university level course, students should be prepared to complete approximately ***one hour of homework each night***. In addition, it is highly advisable for students to

- Spend 15 to 30 minutes each day reviewing their notes (**No excuses! The notes can be found at** www.misternolfi.com!)
- Make summary notes once per week (summarize the most important concepts learned)
- Ask for help whenever needed
- Take an active role in their learning

PUNCTUALITY

Students who are frequently late for class miss important learning experiences and cause unnecessary disruptions to the learning of other students. In addition, such students often set a negative pattern that will likely be difficult to break later in life. In school, the consequences for tardiness are usually not severe. In the workplace, however, lack of punctuality generally leads to dismissal (i.e. firing)! To encourage students to be on time for class, tardy students must choose one of the following comsequences:

- Do **five push-ups** (in front of the class) **for every minute late**
- Stay after school **five minutes for every minute late** to help clean up our classroom

(Students who smoke are very often late for class because of their desire to "have a smoke" in between classes. Such students are usually suffering from nicotine addiction and may require medical treatment for their nicotine dependence. Students who do not smoke find it much easier to remain focused on their classes and they also enjoy the very strong likelihood of better health.)

BEING EXCUSED FROM CLASS

Students must use all class time for the express purpose of learning! This cannot be accomplished if students ask constantly to be excused from class. Occasionally, however, it is necessary for students to leave class to use a washroom. As long as the privilege of washroom breaks is not abused, permission will be granted. Those who ask to be excused frequently, however, will be placed on a "Potty Pass" system allowing only three washroom breaks per month. Students who leave class for unreasonably long periods will forfeit washroom privileges altogether! If a student has a medical condition that necessitates frequent use of a washroom, permission for such will be granted upon presentation of a medical certificate.