



Ontario eSecondary School Course Outline 2020-2021

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| Ministry of Education Course Title: Foundations of Mathematics Grade 11, College Preparation | |
| Ministry Course Code: MBF3C | |
| Course Type: College Preparation | |
| Grade: 11 | |
| Credit Value: 1.0 | |
| Prerequisite(s): Foundations of Mathematics, Gr. 10 Applied | |
| Department: Mathematics | |
| Course developed by: Andrew Lee | Date created: Nov 15, 2020 |
| Length: One Semester | Hours: 110 |
| This course has been developed based on the following Ministry documents: <ol style="list-style-type: none"> 1. <i>The Ontario Curriculum, Grades 11 and 12 Mathematics, Revised 2007</i> 2. <i>Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools (2010)</i> | |

COURSE DESCRIPTION/RATIONALE

This course enables students to broaden their understanding of mathematics as a problem-solving tool in the real world. Students will extend their understanding of quadratic relations; investigate situations involving exponential growth; solve problems involving compound interest; solve financial problems connected with vehicle ownership; and develop their ability to reason by collecting, analysing, and evaluating data involving one variable; connect probability and statistics; solve problems in geometry and trigonometry. Students will consolidate their mathematical skills as they solve problems and communicate their thinking.

<http://www.edu.gov.on.ca/eng/curriculum/secondary/math1112currb.pdf>

OVERALL CURRICULUM EXPECTATIONS

| | |
|----------------------------------|--|
| MATHEMATICAL MODELS | MAKE CONNECTIONS BETWEEN THE NUMERIC, GRAPHICAL, AND ALGEBRAIC REPRESENTATIONS OF QUADRATIC RELATIONS, AND USE THE CONNECTIONS TO SOLVE PROBLEMS; |
| | DEMONSTRATE AN UNDERSTANDING OF EXPONENTS, AND MAKE CONNECTIONS BETWEEN THE NUMERIC, GRAPHICAL, AND ALGEBRAIC REPRESENTATIONS OF EXPONENTIAL RELATIONS; |
| | DESCRIBE AND REPRESENT EXPONENTIAL RELATIONS, AND SOLVE PROBLEMS INVOLVING EXPONENTIAL RELATIONS ARISING FROM REAL–WORLD APPLICATIONS. |
| PERSONAL FINANCE | COMPARE SIMPLE AND COMPOUND INTEREST, RELATE COMPOUND INTEREST TO EXPONENTIAL GROWTH, AND SOLVE PROBLEMS INVOLVING COMPOUND INTEREST; |
| | COMPARE SERVICES AVAILABLE FROM FINANCIAL INSTITUTIONS, AND SOLVE PROBLEMS INVOLVING THE COST OF MAKING PURCHASES ON CREDIT; |
| | INTERPRET INFORMATION ABOUT OWNING AND OPERATING A VEHICLE, AND SOLVE PROBLEMS INVOLVING THE ASSOCIATED COSTS. |
| GEOMETRY AND TRIGONOMETRY | REPRESENT, IN A VARIETY OF WAYS, TWO–DIMENSIONAL SHAPES AND THREE–DIMENSIONAL FIGURES ARISING FROM REAL–WORLD APPLICATIONS, AND SOLVE DESIGN PROBLEMS; |
| | SOLVE PROBLEMS INVOLVING TRIGONOMETRY IN ACUTE TRIANGLES USING THE SINE LAW AND THE COSINE LAW, INCLUDING PROBLEMS ARISING FROM REAL–WORLD APPLICATIONS. |
| DATA MANAGEMENT | SOLVE PROBLEMS INVOLVING ONE–VARIABLE DATA BY COLLECTING, ORGANIZING, ANALYSING, AND EVALUATING DATA; |
| | DETERMINE AND REPRESENT PROBABILITY, AND IDENTIFY AND INTERPRET ITS APPLICATIONS. |

COURSE CONTENT

| <i>Unit</i> | <i>Length</i> |
|--------------------------------------|------------------|
| 1: Trigonometry | 20.5 hours |
| 2: Exponentials | 18 hours |
| 3: Finance | 15.5 hours |
| 4: Quadratics | 28.5 hours |
| 5: Probability and Statistics | 25.5 hours |
| Final Exam | 2 hours |
| Total | 110 Hours |

UNIT DESCRIPTIONS

Unit 1 - Trigonometry

In this unit students will learn how to represent, in a variety of ways, two-dimensional shapes and three dimensional figures arising from real-world applications, and solve design problems. This unit will also prepare students to solve problems involving trigonometry in acute triangles using the sine law and the cosine law, including problems arising from real-world applications.

Unit 2 - Exponentials

In this unit students will develop an understanding of exponents, and make connections between the numeric, graphical, and algebraic representations of exponential relations. By the end of this unit, students will know how to describe and represent exponential relations, and solve problems involving exponential relations arising from real world applications.

Unit 3 – Finance

In this unit students will learn how to compare services available from financial institutions, and solve problems involving the cost of making purchases on credit. By the end of this unit students will know how to interpret information about owning and operating a vehicle, and solve problems involving the associated costs.

Unit 4 - Quadratics

In this unit students will learn how to make connections between the numeric, graphical, and algebraic representations of quadratic relations, and use the connections to solve problems. Students will learn the key characteristics of the quadratic models and the role of their transformations.

Unit 5 – Probability and Statistics

In this unit students will learn how to solve problems involving one-variable data by collecting, organizing, analysing, and evaluating data. By the end of the unit, students will know how to determine and represent probability, and identify and interpret its applications.

TEACHING AND LEARNING STRATEGIES

The students will experience a variety of activities:

Whole-Class Activities (facilitated through discussion forums)

Whole class activities are designed to introduce concepts and skills that are directly applicable to the workplace and to build on the content being studied during small group and individual activities. These activities include the following:

Class discussions that are facilitated through video conferencing and telephone conversations with their subject teacher or discussions with other students concerning the concepts and skills being studied.

Video presentations and technological aids (research) with videos embedded to enrich the course content and clarify concepts and skills being studied. Also the use of online pre-approved quizzes and games to help a student become more familiar with the concepts and skills being studied.

Diagnostic and review activities (audio and video taping) can be student-lead or teacher lead to work as a review for students through audio and video made to share among each other to help reinforce the concepts and skills being studied.

Brainstorming, charts and graphs are a great way for students to demonstrate their knowledge of subject matter through graphic organizers, pictures, and texts. This is communicated through assignments in Moodle.

Individual Activities

The teacher should provide a variety of individual assignments to expand and consolidate the learning that takes place in the whole-class and small group activities. Individual activities allow the teacher to accommodate interests and needs and to access the progress of individual students. The teacher plays an important role in supporting these activities through the provision of ongoing feedback to the students, both orally and in writing. Teachers are encouraged to include individual activities such as the following in the course:

Research is completed in an online environment by teaching the students first about plagiarism rules and giving examples of good sources to use. The students are not only limited to the online search for information, but have resources available by links on the Moodle page of information that has been scanned and uploaded.

Individual assignments are worked on at a student's own pace. The teacher can support the student in these activities with ongoing feedback.

Oral presentations are facilitated through the use of video conferencing and video recording.

Practical extension and application of knowledge helps students develop their own voice, and gives them the ability to make personal connections, and connections to the world throughout their course. Students are given a variety of reading and viewing texts to give them many chances to apply their new concepts, skills, and knowledge.

Ongoing project work is something that is valued in the earning of an English credit. The ongoing project can be submitted to the teacher for ongoing feedback in both written and oral work.

Reading students are able to read material online. The students may print out the reading material to use it to highlight, take notes, and have with them when a computer is not available.

Written assignments are used to allow students to develop their skills in writing, comprehension, and communication. With the online format students submit their work, and have a chance to get feedback from the teacher, and submit their best work. This can be demonstrated with reading responses, personal writing, report writing, essay writing, script writing, business and technical writing, and individual research assignments.

ASSESSMENT, EVALUATION, AND REPORTING

Assessment: The process of gathering information that accurately reflects how well a student is achieving the identified curriculum expectations. Teachers provide students with descriptive feedback that guides their efforts towards improved performance.

Evaluation: Assessment of Learning focuses on Evaluation which is the process of making a judgement about the quality of student work on the basis of established criteria over a limited, reasonable period of time.

Reporting: Involves communicating student achievement of the curriculum expectations and Learning Skills and Work Habits in the form of marks and comments as determined by the teacher’s use of professional judgement.

STRATEGIES FOR ASSESSMENT

Assessment practices can nurture students’ sense of progress and competency and information instruction. Many diagnostic tools, e.g. checklists and inventories, are used at regular intervals throughout the units to encourage students’ understanding of their current status as learners and to provide frequent and timely reviews of their progress. Assessment of student acquisition of listening and talking, reading and viewing and writing skills also occurs regularly through unobtrusive teacher observation and conferencing.

Units conclude with performance tasks. Teachers are encouraged to share goals with students early in the course and to connect unit learning experiences frequently and explicitly with big ideas, overall expectations, and performance tasks, i.e. check bricks; teacher-adapted generic rubrics available in many sources, including the *Ontario Secondary School Literacy Course (OSSLC) Profile*, so that they are more task-specific. The teacher might ask: “What does the criteria look like for this particular task?” Or “What does limited effectiveness look like?” The teacher could involve students in the discussion or creation of rubrics, and teach students to use rubrics as a learning tool that can support the writing process and practice.

ASSESSMENT ACTIVITIES

- Homework assignments
- Individual conference meetings
- Discussion Forums
- Diagnostic tests and writing tasks
- Editing Checklists
- Reflections
- Oral presentations & Active Listening
- Tests & Exam
- Evaluations
- Labs and interactive diagrams

EVALUATION

The final grade will be determined as follows:

- Seventy per cent of the grade will be based on evaluation conducted throughout the course. This portion of the grade should reflect the student’s most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement.
- Thirty per cent of the grade will be based on a final evaluation administered at or towards the end of the course. This evaluation will be based on evidence from one or a combination of the following: an examination, a performance, an essay, and/or another method of evaluation suitable to the course content. The final evaluation allows the student an opportunity to demonstrate comprehensive achievement of the overall expectations for the course.

(*Growing Success: Assessment, Evaluation and Reporting in Ontario Schools*. Ontario Ministry of Education Publication, 2010 p.41)

| Weightings | |
|-------------------------|-----------|
| Course Work | 70 |
| Knowledge/Understanding | 17.5 |
| Thinking/Inquiry | 17.5 |
| Communication | 17.5 |
| Application | 17.5 |
| Final Evaluation | 30 |
| Final Exam | 30 |

TERM WORK EVALUATIONS (70%):

| Evaluation Item | Description | Category |
|--------------------------|---|----------|
| Problem sets | Problem sets supplement lessons and are used to assess whether or not students are meeting criteria for success | K,T,C,A |
| End of Unit Conversation | Unit reflection happens at the end of each unit for both student and teacher to reflect on their process and understanding in the unit. | K,T,C,A |
| Unit Quiz | Each unit has a short quiz on material covered up to the quiz. | K,T,C,A |
| Unit Assignment | Unit assignments are based on curriculum expectations and cover the entirety of each unit | K,T,C,A |

FINAL EVALUATIONS (30%):

| Evaluation Item | Description | Category |
|-----------------|--|----------|
| Final Exam | A final, written examination, covering all curriculum expectations for the course. | K,T,C,A |

AFL/AAL/AOL Tracking sheet:

Unit 1: Trigonometry

| AAL | AFL | AOL |
|--------------------|---|--|
| -Handout Solutions | -Lesson Notes -Discussion Forum Post | -Quiz -Unit Assignment -End of unit discussion |

Unit 2: Exponentials

| AAL | AFL | AOL |
|--------------------|---|--|
| -Handout Solutions | -Lesson Notes -Discussion Forum Post | -Quiz -Unit Assignment -End of unit discussion |

Unit 3: Finance

| AAL | AFL | AOL |
|--------------------|---|--|
| -Handout Solutions | -Lesson Notes -Discussion Forum Post | -Quiz -Unit Assignment -End of unit discussion |

Unit 4: Quadratics

| AAL | AFL | AOL |
|--------------------|---|--|
| -Handout Solutions | -Lesson Notes -Discussion Forum Post | -Quiz -Unit Assignment -End of unit discussion |

Unit 5: Probability and Statistics

| AAL | AFL | AOL |
|--------------------|---|--|
| -Handout Solutions | -Lesson Notes -Discussion Forum Post | -Quiz -Unit Assignment -End of unit discussion |

Unit 6: Final Assessments

| AOL |
|-------------|
| -Final Exam |

CONSIDERATION FOR PROGRAM PLANNING

Students learn best when they are engaged in a variety of ways of learning. Guidance and career education courses lend themselves to a wide range of approaches in that they require students to research, think critically, work cooperatively, discuss relevant issues, and learn through practice in a variety of settings. Helping students become self-directed, lifelong learners is a fundamental aim of the guidance and career education curriculum. When students are engaged in active and experiential learning strategies, they tend to retain knowledge for longer periods and develop meaningful skills. Active and experiential learning strategies also enable students to apply their knowledge and skills to real-life issues and situations.

ANTIDISCRIMINATION EDUCATION IN GUIDANCE AND CAREER EDUCATION

Classroom teachers are the key educators of students who have special education needs. They have a responsibility to help all students learn, and they work collaboratively with special education teachers, where appropriate, to achieve this goal. Special Education Transformation: The Report of the Co-Chairs with the Recommendations of the Working Table on Special Education, 2006 endorses a set of beliefs that should guide program planning for students with special education needs in all disciplines. Those beliefs are as follows: All students can succeed. Universal design and differentiated instruction are effective and interconnected means of meeting the learning or productivity needs of any group of students. Successful instructional practices are founded on evidence-based research, tempered by experience.

PROGRAM CONSIDERATIONS FOR ENGLISH LANGUAGE LEARNERS

Ontario schools have some of the most multilingual student populations in the world. The first language of approximately 20 per cent of the students in Ontario’s English language schools is a language other than English. Ontario’s linguistic heritage includes several Aboriginal languages; many African, Asian, and European languages; and some varieties of English, such as Jamaican Creole. Many English language learners were born in Canada and raised in families and communities in which languages other than English were spoken, or in which the variety of English spoken differed significantly from the English of Ontario

classrooms. Other English language learners arrive in Ontario as newcomers from other countries; they may have experience of highly sophisticated educational systems, or they may have come from regions where access to formal schooling was limited. When they start school in Ontario, many of these students are entering a new linguistic and cultural environment.

THE ROLE OF TECHNOLOGY IN THE ENGLISH PROGRAM

Information and communications technologies (ICT) provide a range of tools that can significantly extend and enrich teachers' instructional strategies and support students' language learning. ICT tools include multimedia resources, databases, Internet websites, digital cameras, and word-processing programs. Tools such as these can help students to collect, organize, and sort the data they gather and to write, edit, and present reports on their findings. Information and communications technologies can also be used to connect students to other schools, at home and abroad, and to bring the global community into the local classroom. Whenever appropriate, therefore, students should be encouraged to use ICT to support and communicate their learning.

ACCOMMODATIONS

Accommodations will be based on meeting with parent, teachers, administration and external educational assessment report. The following three types of accommodations may be provided:

- Instructional accommodations:** such as changes in teaching strategies, including styles of presentation, methods of organization, or use of technology and multimedia.
- Environmental accommodations:** such as preferential seating or special lighting.
- Assessment accommodations:** such as allowing additional time to complete tests or assignments or permitting oral responses to test questions.

Other examples of modifications and aids, which may be used in this course, are:

- Provide step-by-step instructions.
- Help students create organizers for planning writing tasks.
- Record key words on the board or overhead when students are expected to make their own notes.
- Allow students to report verbally to a scribe (teacher/ student) who can help in note taking.
- Permit students a range of options for reading and writing tasks.
- Where an activity requires reading, provide it in advance.
- Provide opportunities for enrichment.