

# Information Technology (BIT)

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## Information Technology (BIT) Courses

### **BIT 1000 [0.5 credit]**

#### **Mathematics I for NET**

Tailored for students in the Network Technology program, this course covers basic concepts in functions (polynomials, exponential, logarithmic) and introduces concepts of limits, derivatives and rules of differentiation, applications of differentiation (max-min problems, curve sketching) and integration.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1100, BIT 1200, ECON 1401, ECON 1402, MATH 1002, MATH 1004, MATH 1007, MATH 1009, MATH 1052, MATH 1401, MATH 1402.

Prerequisite(s): restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial/laboratory one hour a week.

### **BIT 1001 [0.5 credit]**

#### **Mathematics II for NET**

Tailored for students in the Network Technology program, this course covers systems of linear equations, vector space of n-tuples, subspaces and bases, matrix transformations, kernel, range, matrix algebra and determinants, inner products and orthogonality, eigenvalues, diagonalization and applications.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1101, BIT 1201, ECON 1401, ECON 1402, MATH 1104, MATH 1107, MATH 1119, MATH 1152, MATH 1401, MATH 1402.

Prerequisite(s): BIT 1000.

Lectures three hours a week, tutorial and laboratory one hour a week.

### **BIT 1002 [0.5 credit]**

#### **Physics for Information Technology I**

An introductory course on energy, thermodynamics, sound and electromagnetic waves, optics, and modern physics. Practical skills are learned in the laboratory, which is a required part of the course.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1203, PHYS 1001, PHYS 1003, PHYS 1007.

Prerequisite(s): BIT 1100.

Lectures three hours a week, tutorial three hours/laboratory three hours alternate weeks.

### **BIT 1006 [0.5 credit]**

#### **Achieving Success in Changing Environments**

Students explore the possibilities ahead, assess their own aptitudes and strengths, and apply critical thinking and decision-making tools to help resolve some of the important issues in our complex society with its competing interests.

Prerequisite(s): Restricted to students in the B.I.T. degree program.

Lectures three hours a week.

### **BIT 1007 [0.5 credit]**

#### **Physics for NET**

An introductory course on energy, electrical networks (AC and DC circuits, resistance, impedance, capacitance), electrostatics (electric fields, static electricity), electromagnetism, electromagnetic waves, optics, and other topics in modern physics. Practical skills are learned in the laboratory, which is a required part of the course.

Precludes additional credit for BIT 1003 (no longer offered), BIT 1204, PHYS 1002, PHYS 1004, PHYS 1008. Prerequisite(s): BIT 1000, Restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial three hours/laboratory three hours alternate weeks

### **BIT 1100 [0.5 credit]**

#### **Mathematics I for IMD**

Tailored for students in the Interactive Multimedia Design program, this course covers basic concepts in functions (polynomials, exponential, logarithmic) and introduces concepts of limits, derivatives and rules of differentiation, applications of differentiation (max-min problems, curve sketching) and integration.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1000, BIT 1200, ECON 1401, ECON 1402, MATH 1002, MATH 1004, MATH 1007, MATH 1009, MATH 1052, MATH 1401, MATH 1402.

Prerequisite(s): restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial/laboratory one hour a week.

### **BIT 1101 [0.5 credit]**

#### **Mathematics II for IMD**

Tailored for students in the Interactive MultiMedia Design program, this course covers systems of linear equations, vector space of n-tuples, subspaces and bases, matrix transformations, kernel, range, matrix algebra and determinants, inner products and orthogonality, eigenvalues, diagonalization and applications.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1001, BIT 1201, ECON 1401, ECON 1402, MATH 1104, MATH 1107, MATH 1119, MATH 1152, MATH 1401, MATH 1402.

Prerequisite(s): BIT 1100.

Lectures three hours a week, tutorial and laboratory one hour a week.

**BIT 1200 [0.5 credit]****Calculus**

Limits. Differentiation of the elementary functions, including trigonometric functions. Rules of differentiation. Applications of differentiation: max-min problems, curve sketching, approximations. Introduction to integration: definite and indefinite integrals, areas under curves, fundamental theorem of calculus.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1000, BIT 1100, MATH 1002, MATH 1004, MATH 1007, MATH 1009, MATH 1052, MATH 1401/ECON 1401, MATH 1402/ECON 1402.

Prerequisite(s): Ontario Grade 12 Mathematics: Advanced Functions; or MATH 0005 and MATH 0006; or equivalent.

Restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial/laboratory one hour a week.

**BIT 1201 [0.5 credit]****Linear Algebra**

Systems of linear equations; vector space of n-tuples, subspaces and bases; matrix transformations, kernel, range; matrix algebra and determinants. Dot product.

Complex numbers (including de Moivre's Theorem, and n-th roots). Eigenvalues, diagonalization and applications.

Note: MATH 1119 is not an acceptable substitute for BIT 1201.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1001, BIT 1101, MATH 1102, MATH 1104, MATH 1107, MATH 1119, MATH 1152, MATH 1401/ECON 1401, MATH 1402/ECON 1402.

Prerequisite(s): Ontario Grade 12 Mathematics: Advanced Functions, or MATH 0005, or equivalent, or permission of the School. restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial and laboratory one hour a week.

**BIT 1203 [0.5 credit]****Newtonian Physics**

Mechanics, properties of matter, thermodynamics.

Applications chosen in part from the life sciences.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1002, PHYS 1001, PHYS 1003, PHYS 1007.

Prerequisite(s): (i) Grade 12 Mathematics: Advanced Functions or equivalent; or (ii) Grade 12 Mathematics: Calculus and Vectors or equivalent, or MATH 1007 or BIT 1200 (may be taken concurrently); or (iii) permission of the Department. Restricted to students in the B.I.T. degree program.

Lectures three hours a week, laboratory or tutorial three hours a week.

**BIT 1204 [0.5 credit]****Electromagnetism & Modern Physics**

Electricity and magnetism, DC and AC circuits, wave motion and light. Elements of modern physics.

Applications chosen in part from the life sciences.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 1003 (no longer offered), BIT 1007, PHYS 1002, PHYS 1004, PHYS 1008.

Prerequisite(s): BIT 1203 or PHYS 1001 or PHYS 1003 or PHYS 1007 or permission of the Department. Restricted to students in the B.I.T. degree program.

Lectures three hours a week, laboratory or tutorial three hours a week.

**BIT 1400 [0.5 credit]****Introduction to Programming and Problem Solving**

Introduction to basic concepts of procedural programming and algorithm design in C. Topics include: basic variables, functions, operators, program control with iteration and conditionals, I/O operations, text and file processing, structures, arrays, pointers, debugging, algorithmic thinking and pseudocode, computer architecture, operating systems, and libraries.

Includes: Experiential Learning Activity

Precludes additional credit for COMP 1005, COMP 1405, ITEC 1400, ITEC 1401.

Prerequisite(s): Restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial/laboratory three hours a week.

**BIT 2000 [0.5 credit]****Introduction to Statistics**

This course covers data analysis, introduction to probability theory, some standard discrete and continuous distributions and their application to interval estimation and significance testing, computational aspects of statistics.

Includes: Experiential Learning Activity

Precludes additional credit for BIT 2009, BIT 2100 (no longer offered), BIT 2300 (no longer offered), ECON 2201 (no longer offered), ECON 2210, ENST 2006, GEOG 2006, STAT 2507, STAT 2606, and STAT 3502.

Prerequisite(s): restricted to students in the BIT degree program.

Lectures three hours a week, tutorial/laboratory one hour a week.

**BIT 2001 [0.5 credit]****Introduction to Business**

An overview of the most fundamental business functions.

The management of people, human resources, marketing, accounting and finances, business law and operations.

Includes: Experiential Learning Activity

Prerequisite(s): restricted to students in the B.I.T. degree program.

Lectures: three hours a week.

**BIT 2002 [0.5 credit]****Marketing in the IT sector**

Basic problems and practices in marketing. Marketing strategies, planning, packaging, branding and promotion at the level of the individual firm; distribution channels.

Includes: Experiential Learning Activity

Precludes additional credit for BUSI 2204.

Prerequisite(s): restricted to students in the B.I.T. degree program.

Lectures three hours a week.

**BIT 2006 [0.5 credit]****Elective**

Students must choose from among a list of approved Electives at Algonquin College.

Precludes additional credit for BIT 3003 (no longer offered).

Prerequisite(s): restricted to students in the B.I.T. degree program.

Lectures three hours a week, or as arranged.

**BIT 2008 [0.5 credit]****Multimedia Data Management**

Concepts and fundamentals of database systems.

Design of relational databases, normalisation, referential integrity, structured query language (SQL), server-side scripting, organisation of multimedia content, dynamic page loading, storage and compression of media, media network considerations, digital watermarking and rights management.

Includes: Experiential Learning Activity

Precludes additional credit for ITEC 2000, IMD 2000 (no longer offered), IRM 2000 (no longer offered).

Prerequisite(s): BIT 1400 and IMD 1005 or IRM 1005.

Lecture three hours a week, tutorial/laboratory two hours a week.

**BIT 2009 [0.5 credit]****Statistics for Technology**

This course covers statistical data analysis with an emphasis on hypothesis testing including parametric tests (e.g., t-tests, ANOVA) and non-parametric tests (e.g., Kruskal-Wallis, Friedman, chi-square), correlation and linear regression. Provides an introduction to probability theory and distributions (e.g. binomial, normal).

Includes: Experiential Learning Activity

Precludes additional credit for BIT 2000, BIT 2100 (no longer offered), BIT 2300 (no longer offered), ECON 2201 (no longer offered), ECON 2210, ENST 2006, GEOG 2006, STAT 2507, STAT 2606, and STAT 3502.

Prerequisite(s): Restricted to students in the BIT degree program.

Lectures three hours a week, tutorial/laboratory one hour a week.

**BIT 2010 [0.5 credit]****Differential Equations & Multivariate Calculus**

Curves and surfaces. Polar, cylindrical and spherical coordinates. Partial derivatives, gradients, extrema and Lagrange multipliers. Exact differentials. Multiple integrals over rectangular and general regions. Integrals over surfaces. Line integrals. Vector differential operators. Green's Theorem, Stokes' theorem, Divergence Theorem. Applications.

Prerequisite(s): BIT 1200.

Lectures three hours a week, tutorial one hour a week.

**BIT 2400 [0.5 credit]****Intermediate Programming**

Introduction to object-oriented programming and algorithm design in C++. Topics include code and data encapsulation using classes and objects, inheritance, polymorphism, object-oriented design, data and code abstraction, program efficiency, user interface objects, event-driven systems, and an introduction to linked-lists and searching.

Includes: Experiential Learning Activity

Precludes additional credit for COMP 1006, COMP 1406, ITEC 2400, ITEC 2401.

Prerequisite(s): BIT 1400. Restricted to students in the B.I.T. degree program.

Lectures three hours a week, tutorial/laboratory three hours a week.

**BIT 3999 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity

**BIT 4000 [0.5 credit]****Directed Studies**

Independent study under the supervision of a member of the School of Information Technology, open only to students in the B.I.T. program. Students are required to obtain their supervisor's written approval prior to registration and are limited to one such course in their program.

Includes: Experiential Learning Activity

Prerequisite(s): permission of the School of Information Technology.

**BIT 4001 [0.5 credit]****Selected Topics in Information Technology**

Topics not ordinarily treated in the regular course program due to their contemporary subject matter. The choice of topics varies from year to year.

Prerequisite(s): third-year standing in the BIT Program or permission of the department.

Lecture three hours a week.