

ACE

ACADEMIC + CAREER ENTRANCE

BACKGROUND | POLICY | RESOURCES | INFORMATION



REFERENCE GUIDE

2018

CSC
COLLEGE SECTOR COMMITTEE
FOR ADULT UPGRADING + ACE

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In recent years, the need to re-issue the original Academic and Career Entrance (ACE) program documentation to colleges and to revisit province-wide policies and processes for ACE delivery has become apparent, based on ongoing inquiries submitted to the College Sector Committee for Adult Upgrading (CSC) and also via issues and questions raised at provincial Academic Upgrading/ACE managers meetings.

In addition, requests for information from the Ministry of Advanced Education and Skills Development (MAESD) have also pointed to the need to consolidate historical and current ACE documentation and information.

The terms and content of the original (2004) ACE program approval remain in place, though at some colleges the documentation and organizational history regarding ACE have been displaced within the institution.

This guide offers an updated compilation of ACE background, policies, and resources and provides information that supports consistent delivery of the ACE program across Ontario's 24 public colleges and promotes student mobility and transfer credit.

The intended audience is academic managers within the colleges who are involved with preparatory programming and the delivery of ACE.

It may also be useful for Registrar/Admissions personnel, especially with respect to issues of ACE transfer credit. There has also been interest from some Vice Presidents, Academic in learning more about the background and current status of ACE program delivery.

The Academic and Career Entrance (ACE) program is an Ontario college grade 12 equivalent program for adult students who wish to upgrade their skills and knowledge to meet admission requirements for Ontario college postsecondary programs or for registration as an apprentice in Ontario. Some adult students also use ACE to upgrade for direct entry into employment.

The program approval (curriculum, graduation requirements, tuition structure, etc.) for ACE resides in the Postsecondary Education Division of MAESD, while the main source of funding for the activity, the Literacy and Basic Skills (LBS) program, resides in the Employment and Training Division of MAESD.

Many colleges deliver ACE, along with "Pre-ACE" courses, under the broader umbrella of "Academic Upgrading," "Academic and Career Preparation," or "College and Career Preparation."

Since 2004, ACE has been delivered by all 24 public colleges (English and French) in Ontario at almost 80 sites across the province. The ACE program is also delivered online (via the ACE Distance / Online program) by the College Sector Committee for Adult Upgrading (CSC). In addition, the CSC acts on behalf of all 24 colleges to support and coordinate ACE program delivery and to liaise with MAESD and other stakeholders.

Since 1995, the annual *Prepared for Success* report has been compiled and issued by the CSC to document program choice, GPA, and retention data in semester one for adult students who move from academic upgrading programs (including ACE) into college postsecondary programs. In 2016-17, more than 3,750 former AU/ACE students entered a variety of college postsecondary programs across the province, achieving an average semester one GPA of 3.15 [*Prepared for Success 2016-17*]. [SEE APPENDIX 1 — 2016-17 FACT SHEET.](#)

An environmental scan was conducted in summer 2017 to gather information about the current status of ACE program delivery across Ontario's colleges. Twenty-two colleges responded to the e-scan questionnaire, which consisted of 23 questions divided into five sections:

- Instructions and Contact Information;
- ACE Course Outlines;
- ACE Outcomes and Grading;
- ACE Documentation and Recognition; and
- ACE - Broader Issues and Strengths.

This guide addresses a number of the key issues identified and discussed in the e-scan report, including:

- Funding for the ACE program delivery;
- ACE program curriculum;
- Mastery learning and grading in ACE courses;
- ACE course codes across colleges;
- Responsibility for retaining ACE documentation;
- Value of the ACE program within colleges;
- Perceived competition between ACE and postsecondary General Arts and Sciences "Pre-" programs; and
- Emerging trends and factors affecting ACE delivery in college ACE programs.

Although the ACE program in its current form was approved for delivery in 2004, the previous iteration of ACE, Basic Training for Skills Development Level 4 (BTSD Level 4) dates back to the emergence of the community college system in the late 1960's. In those early years, BTSD was one of the first system-wide programs approved for delivery, and it still exists in the college system today. Originally, BTSD consisted of four separate programs:

- BTSD Level 1: equivalent to grades 1 to 4;
- BTSD Level 2: equivalent to grades 5 to 8 ;
- BTSD Level 3: equivalent to grade 9 - 10; and
- BTSD Level 4: equivalent to grade 11 – 12 (now ACE).

All four levels included mathematics and communications courses, while BTSD Level 3 and Level 4 also included sciences. Colleges issued completion certificates for each level, specifying the courses that the student had completed. From the 1980 BTSD program description:

Purpose: *to meet individual needs and develop competencies in the skills of communications, mathematics and science required to access other training programs and/or the job market. The development of personal, social or life skills is general for all subjects and is particularly included as part of the communications subject area. The program has been designed to provide a natural training progression from skills required by or common to all occupations to higher-level skills required by more sophisticated occupations.*

Entrance Requirements: *Pre-tests will determine the trainee's functional level to assist the institution to place the trainee at the appropriate learning level. It also enables the trainee to bypass certain section(s) if he/she can already meet the performance criteria. Individual trainees will be required to meet specified objectives and their program time will be negotiated taking into consideration the average time required, the time available, prior experiences and learning style.*

Career Clusters: *The career cluster courses will provide entry into the corresponding skills or apprenticeship programs. They also provide the basic communications, mathematics, science and other job-related skills to allow the graduate to begin to work in some occupations. The general BTSD cluster provides entry into those occupations requiring grade equivalency.*

Average Duration: *Duration will vary depending on student aptitude and point of entry. Maximum duration of government sponsored students in BTSD training is 52 weeks. Maximum permissible time for each level is as follows: L1 – 24 weeks; L2 – 36 weeks; L3 – 32 weeks; and L4 – 32 weeks.*

It is interesting to note that many features of the BTSD Levels 1-4 program listed above were implemented in provincially-funded adult upgrading programs which emerged in the 1980's and 90's including the Technical Upgrading Program, the Ontario Basic Skills program and the Literacy and Basic Skills program (both the original 1997-98 and the updated 2011-12 LBS programs). [SEE APPENDIX 2 — DETAILS FROM THE 1980 OUTLINE.](#)

In 2002, the CSC undertook a consultative project with the support and participation of all 24 colleges to update and re-name the BTSD Level 4 program. The goals of the project were:

- to review the BTSD Level 4 curriculum being delivered across colleges;
- to review relevant secondary school curricula;
- to develop new courses which better reflect the academic preparation required for adults seeking to enter college postsecondary or apprenticeship;
- to promote consistent program delivery across all colleges;
- to promote course recognition and student mobility across colleges; and
- to validate the curriculum and instructional objectives to ensure grade 12 equivalency and continued access to postsecondary and apprenticeship for adult students in the college system.

In 2003, as a result of extensive consultation with college Academic Upgrading programs, the CSC submitted a program modification proposal to the [then] Program Quality Unit, Colleges Branch, Ministry of Training, Colleges and Universities (MTCU). Briefly, the proposal included additional curriculum and courses (for example, Computer Fundamentals), updated outcomes, an increased funding weight, and a new name: Academic and Career Entrance.

All 24 Vice-Presidents, Academic, provided written agreement to the proposed modifications to BTSD Level 4 and the transition to ACE. (**SEE APPENDIX 3** for an excerpt from the 2003 Program Modification proposal.)

In 2004, MTCU approved the ACE program proposal, including a small increase in the funding weight of the program within the tuition-short category. All college presidents received a letter confirming the approval. **SEE APPENDIX 4 — COPY OF THE LETTER.** The CSC provided the approved course outlines and updated graduation requirements to all colleges, and they were implemented shortly thereafter. The 2004 ACE approval includes 10 courses, available in both English and French: Communications; Core Mathematics; Business Mathematics; Apprenticeship Mathematics; Technical Mathematics; Biology; Chemistry; Physics; Self-Management/Self-Direction; and Computer Fundamentals.

To earn an ACE Certificate, students must complete four ACE courses: communications, one math course, and two electives. The credential earned is a locally-approved college certificate. (It should be noted that colleges no longer issue BTSD Level 1, 2 or 3 certificates.) In practice, the majority of ACE students take only the course(s) required for admission to their chosen college postsecondary program. However, the ACE Certificate is required for those wishing to register for an apprenticeship and for those needing a grade 12 equivalent credential to present to an employer.

In 2007, MTCU funded the CSC to undertake a pilot project to deliver ACE courses online, using LBS funding as part of the “e-Channel” distance learning initiative within the Employment and Training Division. By 2009, ACE Distance became an ongoing program available in both French and English. **SEE THE “ACE DISTANCE / ONLINE” SECTION OF THIS GUIDE FOR MORE DETAILS.**

Also in 2007-08, at the request of the Ministry of Education, the ACE curriculum was submitted to Curriculum Services Canada to assess the comparability of ACE courses to corresponding secondary school courses. The results of that evaluation are shown here in **TABLE 1**. Curriculum Services Canada also provided a detailed explanation of the features of the course comparability that led to the ACE/secondary school course equivalencies.

TABLE 1: ACE AND ONTARIO SECONDARY SCHOOL COURSE EQUIVALENCIES

ACADEMIC AND CAREER ENTRANCE PROGRAM (ACE)	ONTARIO SECONDARY SCHOOLS
ENGLISH	
ACE Communications	English, Grade 12, College Preparation ENG4
MATH	
ACE Apprenticeship Mathematics	Foundations for College Mathematics, Grade 12, College Preparation MAP4C
ACE Business Mathematics	Foundations for College Mathematics, Grade 12, College Preparation MAP4C
ACE Technical Mathematics	Mathematics for College Technology, Grade 12, College Preparation MCT4C
ACE Core Mathematics	Mathematics for Work and Everyday Life, Grade 12, Workplace Preparation MEL4E
SCIENCE	
ACE Biology	Biology, Grade 11, College Preparation SBI3C
ACE Physics	Physics, Grade 11, University Preparation SPH3U
ACE Physics	Physics, Grade 12, College Preparation SPH4C
ACE Chemistry	Chemistry, Grade 12, College Preparation SCH4C

ACE-OSS Equivalencies, Curriculum Services Canada, 2008

BTSD Levels 1-4, subsequently BTSD Levels 1-3 and ACE, are the only remaining programs that fall under the tuition short category, as listed in MTCU's 2017-18 Enrolment and Audit Guidelines.

As noted in a 2012 MTCU memo to colleges, "Tuition-short funding originated as a category for vocational/prevocational programs of less than 52 weeks' duration with separate payment arrangements, i.e. through federal/provincial training agreements that were grand-parented into Ministry funding and reporting procedures after the original inter-governmental agreements ended." At one time, colleges delivered many short-term programs under the tuition short category. In addition to BTSD, programs such as English as a Second Language, Basic Job Readiness Training, and a variety of locally-driven, employment-focused training programs for which a grade 12 or equivalent was not required were categorized as tuition-short programs. .../7

Seat purchases were commonly made by the [then] Canada Manpower agency and Workers Compensation Board. Private insurance companies and Indigenous organizations also purchased seats for their clients. Students who were not sponsored could often obtain funding for tuition and materials from the colleges' Ontario Special Bursary Plan (OSBP).

Full time activity in tuition short programs is measured in "trainee days," with one day equal to five trainee hours. One weighted funding unit (WFU) is equal to 180 trainee days. Tuition is charged as a weekly rate. Part-time activity is measured in Student Contact Hours (SCH). The hourly tuition is usually set the same as for continuing education courses. Colleges reporting to the Ministry for tuition-short programs must itemize trainee days and SCHs in order to be eligible for a general purpose operating grant allocation. This model readily allows students to enter and exit on a weekly basis, attend full or part-time, and results in students (or sponsoring agencies) only being charged for the number of weeks or hours that the student participates in the program. This was (and still is) key in the self-directed, flexibly-paced programming offered in BTSD Levels 1-3 and ACE.

In 2013, MTCU discontinued the tuition short category for all programs except BTSD Levels 1-3 and ACE. Other programs that had been under the tuition short category were either converted to postsecondary certificate or diploma programs, or discontinued. At that time the CSC, along with a number of colleges, advocated with MTCU to ensure that the tuition short program category remained available for BTSD Levels 1-3 and ACE so that the model of continuous intake, flexibly-paced delivery could continue.

Currently, only a very small number of colleges still offer BTSD 1-3 and ACE programming for fee-payers. Those who do continue to report on that tuition short activity via trainee days and SCHs as outlined above. However, the tuition that each college charges to WSIB for BTSD and ACE courses (under the terms of the provincial WSIB service agreement with all colleges) are based on the tuition short model.

There are two significant contributors to the decline of fee-payer BTSD and ACE students across the colleges. One is the 2012-13 transition from the Ontario Special Bursary Plan to the Institution-Funded Special Bursary, which has resulted in fewer adult students being able to access bursary funds for fee-payer BTSD and ACE programming.

The second contributor is the increasing challenge associated with meeting the targets for the number of "Learners Served" under the MAESD-funded Literacy and Basic Skills (LBS) Service Agreements. As a result, colleges have increasingly moved potential BTSD and ACE students into seats funded through their LBS Service Agreement to help achieve the "Learners Served" target. Because MAESD's LBS guidelines do not support nor mandate any specific curriculum, colleges can use LBS funding to provide "free" seats for BTSD Levels 1-3 and ACE courses.

A significant drawback of colleges having to rely on LBS funding to deliver pre-ACE and ACE is that they must adhere to the mandated LBS performance management framework which does not lend itself to academic, course-based, credentialed programming such as ACE. Also, it has become increasingly difficult to meet contractual LBS obligations with limited provincial funding and increased administrative and reporting demands within the LBS agreements.

When the ACE program approval was granted by MTCU in 2004, the resulting course outlines were created in a format which differs from the current course outline format that is now considered acceptable across colleges.

For example, the original ACE outlines included a mixture of content, outcomes, expectations, and examples of instructional activities. In other words, those original outlines contained curriculum elements as well as objectives and/or outcomes.

Over the years, most colleges have transferred the original ACE outlines into their own course outline template and added information on Essential Employability Skills, internal college processes, etc., while at the same time removing some of the more specific curriculum information which is no longer included in a typical college course outline.

In this guide, the original 2004 ACE course outlines have been reformatted into a more streamlined template. No changes to the course content or outcomes have been made. **THE ORIGINAL OUTLINES, IN THE UPDATED TEMPLATE, CAN BE FOUND IN APPENDIX 5 OF THIS GUIDE.**

Although much of the original ACE curriculum still provides sound background for adults preparing for college postsecondary studies or apprenticeship, all ACE courses should be reviewed and updated in the near future.

The CSC would be pleased to lead a consultative process with all 24 colleges to undertake this curriculum review and renewal. For that purpose, the CSC is liaising with MAESD to identify the process for submitting ACE program revisions and subsequently gaining system-wide approval for those revisions.

Since the original ACE curriculum was evaluated by Curriculum Services Canada and deemed comparable to corresponding Ontario grade 12 college-destination secondary school courses (**SEE TABLE 1**), it would be prudent to undertake a new evaluation for comparability to grade 12 courses when revisions are made to the ACE curriculum.

As mentioned in the “ACE Program Development” section of this guide, the ACE graduation requirements include four courses: communications, one mathematics course, and two electives from the approved ACE course list. Students who complete those requirements are then eligible to receive a locally-approved ACE Certificate from their college. (**See Appendix 6 for a sample certificate.**) Most ACE students take only the course(s) required for admission to their chosen college postsecondary program, but each year a number complete the overall ACE Certificate.

The ACE Certificate is also an acceptable grade 12 equivalent credential for registration as an apprentice in Ontario. Appendix 7 contains MAESD’s most recent (2013) Apprenticeship Policy on Academic Requirements for registration, as well as the “List of Acceptable Documents,” both of which confirm the acceptance of the ACE Certificate as grade 12 equivalent for apprenticeship registration.

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A number of employers also accept the ACE Certificate as grade 12 equivalent for hiring purposes. Colleges often liaise directly with employers if an ACE graduate is applying for employment and the employer requires information about the ACE program and the certificate.

A coordinated provincial campaign to market ACE to employers would be welcomed by all college ACE programs to increase employer awareness and recognition of the ACE credential. To date, funding has not been available for such a marketing initiative, though colleges continue to discuss the need and importance of pursuing this.

All colleges provide some form of recognition for ACE graduates. Some include ACE Certificate recipients in their convocation ceremonies. Others have smaller recognition and celebration events within the Academic Upgrading/ACE department and often invite college executive team members and local dignitaries.

At various points in recent years, the suggestion has been made that all colleges use the same course codes for ACE courses, to promote student mobility and transfer credit.

Since each college has its own format for assigning course codes, it is not possible to have the same codes across all colleges. Some years ago, in order to assist with ACE student mobility, the CSC collected ACE course codes from all colleges for in-class and online delivery options (as these can be different), and compiled them in a single reference document.

The resulting “ACE Course Codes” document has been updated a number of times over the years and was updated again in 2017 as part of the development of this guide. [SEE UPDATED ACE COURSE CODES ON THE CSC WEBSITE.](#)

The ACE Course Codes compilation is provided to all colleges for use by academic managers and admissions personnel. In terms of student mobility, the ACE Course Codes document is particularly useful when a student completes ACE courses at one college but applies to a postsecondary program at another college. It is also useful when a student takes ACE courses at more than one college and completes the graduation requirements for the overall ACE Certificate, in which case transfer credits would be assessed by the college issuing the certificate.

Although ACE course codes cannot be uniform across colleges, it may be feasible for colleges to return to using the original (or updated) ACE course titles. This is an area to be explored further. Having consistent course titles across colleges would further contribute to transparency and enhance student mobility and transfer credit.

The ACE program delivery models in place across the 24 colleges have many similarities and are derived from the 1980 BTSD program guidelines (see [Appendix 2](#)). ACE is a flexible, student-centred program where adult students can:

- be assessed to determine prior learning and starting points in the continuum of the curriculum;
- take advantage of continuous intake throughout the year, i.e. weekly, biweekly, monthly;
- take only the courses needed for their chosen goal;
- learn in a self-directed environment;
- be part of a college community of adult learners;
- have options for flexible scheduling, e.g. full-time, part-time, days, evenings;
- complete course work at an accelerated (or decelerated) pace as appropriate;
- “stop out” if life circumstances warrant but readily return to the program;
- obtain admission requirements for college programs or apprenticeship, or upgrade for employment; and
- complete ACE Certificate requirements if they wish.

These remain as delivery features across colleges. Some colleges also offer traditional, semester-based intake with a teacher-led format for specific courses; but the majority offer continuous intake with a self-directed learning model.

All colleges also deliver “pre-ACE” (BTSD Level 2 and 3) courses. The majority of students start with one or more pre-ACE courses to prepare them for the academic content and rigour of the ACE course(s) required for their postsecondary or apprenticeship goal.

The initial assessment process for students noted above determines placement in the continuum of the pre-ACE through ACE curriculum. Therefore, access to ACE coursework may either be through promotion from pre-ACE courses or by direct entry if a student demonstrates the academic readiness.

As mentioned earlier in this guide, many colleges describe and market their pre-ACE and ACE courses under a broader title or department such as “Academic Upgrading,” “Academic and Career Preparation” or “College and Career Preparation.” This has become more common as colleges have had to rely increasingly (and now almost exclusively) on LBS funding to deliver programming.

Because MTCU’s LBS guidelines do not support any specific curriculum, it has become simpler for many colleges to embed pre-ACE and ACE in the broader “Academic Upgrading” program entity. This is an unfortunate situation for ACE programming across the province because it significantly diminishes awareness and marketing of ACE, both within and outside of the college.

Arguably, the most enduring feature of pre-ACE and ACE program delivery is the opportunity for adult students to “prepare for college at college.” Students can take advantage of college services and resources just as postsecondary students do.

The ACE Distance program provides asynchronous, online delivery for all ten approved ACE courses, in both English and French, with 24/7/365 technical support. The CSC holds the agreement with MTCU to deliver ACE Distance as part of the LBS “e-Channel” distance learning initiative within the Employment and Training Division. A fee-payer stream also exists.

Intakes are monthly, with a minimum of six “free” intakes per year. Applicants must meet similar eligibility requirements as those in classroom-based ACE courses, including completion of the “Learn to Learn” readiness module.

Remedial (pre-ACE) courses are also available in communications and mathematics. In addition, ACE Distance offers university preparation courses in Biology and Chemistry through the fee-paying stream. ACE Distance courses are part of the OntarioLearn consortium (a shared collection of online college courses across all 24 public colleges). In 2018, ACE Distance will be undertaking a refresh and updating of the instructional design and presentation of several courses within the program.

In the LBS-funded (free) stream, students are registered in ACE Distance via the CSC and also with the Part-time Studies department at their local college. Registration at a college provides access to college services and ensures that students receive final grades which become part of their permanent student record and appear on an official transcript. This is essential since students use ACE Distance courses as prerequisites to apply for postsecondary programs, just as classroom-based students do. Fee-paying ACE students also register through their local college but do not have to meet the same eligibility requirements as LBS-funded students do.

Students can be registered concurrently in a classroom-based ACE program and in ACE Distance (free or fee-paying), e.g. a student may take ACE Biology and Chemistry in a classroom setting while also being registered in ACE Communications through ACE Distance. To achieve the requirements for the ACE Certificate, ACE Distance courses can be combined with classroom-based ACE courses. Some students complete all required courses online to qualify for the ACE Certificate, in which case the registering college issues the certificate.

ACE
DISTANCE / ONLINE

www.acedistancedelivery.ca

When the ACE program was initially approved system-wide, all colleges agreed that a 70% passing grade was appropriate for all courses. (The passing grade for most BTSD courses had been 80%.) The majority of colleges surveyed in the 2017 ACE Environmental Scan continue to use a 70% passing grade.

Although it may seem high, it must be noted that ACE programs are in the business of preparing students to succeed in postsecondary programs and/or apprenticeship training, so achieving less than 70% does not bode well for success in further education. In addition, it is important for colleges to distinguish themselves from various non-college adult upgrading programs where the 50% standard is acceptable.

While the official passing grade for ACE course completion may be less than 70% at a small number of colleges, the individualized, mastery learning model still used in most ACE programs requires students to achieve at least 70% (and sometimes more) on assignments, tests, etc. within the course before moving on to new material. As a result, many students achieve 70% or better, irrespective of the stated passing grade.

The majority of ACE students realize that in order to be considered for admission to postsecondary programs they require higher grades than 50% and therefore strive to achieve those grades. This is especially true for students applying to oversubscribed programs where the minimum grades required for consideration is often well over 80%.

The issue of grading standards for ACE courses warrants further discussion among colleges in the context of consistency, student mobility and preparedness for postsecondary studies.

One of the cornerstones of the ACE program is the consistent delivery of ACE course outcomes across all 24 colleges, based on the approved 2004 curriculum. In the 2017 ACE environmental scan, all 22 colleges that responded indicated that they are delivering ACE courses which closely align to the original 2004 ACE course outcomes. The provincial consistency of ACE course delivery is important for a number of reasons:

- to ensure ACE course acceptance for postsecondary admission across colleges;
- to promote a consistent level of knowledge and skills for ACE students as they prepare for further education; and
- to provide seamless transfer credit for ACE students taking courses at more than one college, especially with respect to achieving the requirements for the ACE Certificate.

Although most ACE students take all of their courses at one college, some do complete courses at more than one college and subsequently need to obtain transfer credit if they have met the graduation requirements and wish to receive the ACE Certificate.

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Although most ACE students take all of their courses at one college, some do complete courses at more than one college and subsequently need to obtain transfer credit if they have met the graduation requirements and wish to receive the ACE Certificate.

Several colleges have granted transfer credit for the purpose of issuing the ACE Certificate, and those that have not could do so via their college's existing transfer credit process. The "ACE Course Codes" document is particularly important in assessing transfer credit as well as assessing admission requirements across colleges.

Based on the 2017 ACE environmental scan data, the majority of colleges agree that substitutions or transfer credit of non-ACE courses should not be considered when determining eligibility for the ACE Certificate. The main reason cited for this approach is to maintain the integrity of the ACE program as a college preparatory and upgrading program where adult students "prepare for college at college" using curriculum, instructional approaches, and evaluation criteria designed for that purpose.

A small number of colleges feel that ACE should be subject to the same residency and transfer credit processes as those for postsecondary programs, which could allow transfer credit of non-ACE courses to be used toward the granting of the ACE Certificate. Additional consultation is needed among colleges to fully address this topic and work toward consensus.

The Ontario colleges' Academic and Career Entrance program is a key component of adult education in the province. ACE programs have a long and successful history of producing well-prepared adult students who are highly successful when they transition to postsecondary studies, apprenticeship, and employment.

Although the ACE program is well-established in all 24 public colleges, it would be useful to review and update the curriculum and revisit consensus program policies. It is also important that the CSC proceeds with the engagement of MAESD to discuss options for the funding of ACE program delivery. The CSC hopes that this ACE Reference Guide will be a practical resource to promote understanding of the ACE program and consistency of program delivery and student mobility within this important adult education pathway in Ontario.



- 1 PREPARED FOR SUCCESS FACT SHEET, 2016-17
- 2 BTSD PROGRAM DESCRIPTION, 1980
- 3 BTSD LEVEL 4 PROGRAM MODIFICATION PROPOSAL, 2003
- 4 ACE PROGRAM APPROVAL LETTER, 2004
- 5 ACE COURSE OUTLINES, 2003
- 6 SAMPLE ACE CERTIFICATE
- 7 APPRENTICESHIP POLICY ON ACADEMIC REQUIREMENTS,
MTCU, 2013

FACTSHEET

PREPARED for SUCCESS

College upgrading programs continue to prepare graduates for success in postsecondary programs

What is PREPARED for SUCCESS?

PREPARED for SUCCESS (PFS) is an annual study conducted by the College Sector Committee for Adult Upgrading (CSC). It examines the postsecondary outcomes of students who have moved from upgrading programs to full-time postsecondary programs at their colleges.

How long has this study been conducted?

The PFS study has been conducted annually since 2001, or 18 years.

What is the purpose of PFS?

The purpose of this study is to document the positive impact that academic upgrading has on the success of students who enter postsecondary programs.

What has this study shown?

Every year, PFS has shown that individuals who have received prior training in college academic upgrading programs:

- achieve **high marks** in postsecondary programs;
- have the necessary **commitment** to complete their education; and
- make the **right program choices** (low rate of program change).

Academic upgrading programs continue to provide **thousands of dedicated, well-**

prepared, successful students to Ontario's public colleges.

Who provides the data for this study?

All 24 Ontario public colleges are asked to participate each year. In 2016-2017, 22 colleges provided data.

What are the highlights of the 2016-2017 study?

- A total of 3,750 upgrading graduates enrolled in postsecondary programs — an **increase of 386 students** over the previous year (with two colleges not reporting data).
- These students represent **at least \$9 million in tuition revenue** — plus operating grant funding — for Ontario public colleges in 2016-2017.*

*Calculated at \$2400 tuition per student. Source: ontariocolleges.ca/colleges/paying-for-college

Conclusions

Academic upgrading graduates are **high-achieving, low-attrition** contributors to the Ontario public college system (71% re-enrollment in a second semester, 5% program change, average GPA of 3.15).

Well-prepared, high-performance and career-focused, these students are poised to become highly-skilled workers, contributing significantly to the provincial economy.



This Employment Ontario service is funded in part by the Government of Canada and the Government of Ontario through the Canada-Ontario Job Fund Agreement.



Ministry
of
Education

Ministry of
Colleges and
Universities

Senior and
Continuing
Education
Branch

PROGRAM DESCRIPTION

PROGRAM:

BASIC TRAINING FOR SKILL DEVELOPMENT

Code Number: 9600-000-00

Average Duration: See page 2

PURPOSE:

To meet individual needs and develop competencies in the skills of communications, mathematics and science required to access other training programs and/or the job market. The development of personal, social or life skills is general for all subjects and is particularly included as part of the communications subject area.

The program has been designed to provide a natural training progression from skills required by or common to all occupations to higher level skills required by more sophisticated occupations. The program is divided into four competency levels.

Level	Occupational Goals		
	Technical/ Mechanical	Business and Commerce/ Health Sciences	General Grade-Equivalency
4	Communications Mathematics Science *	Communications Mathematics Science *	Communications Mathematics Science *
3	Communications Mathematics Science *	Communications Mathematics Science *	Communications Mathematics Science *
2	Communications, Mathematics		*
1	Communications, Mathematics		*

* A maximum of 20% instructional time per week may be devoted to related occupational goal instruction.

Levels I and II (Core Programs)

The core program provides training in those basic communications and mathematics skills required by or common to all occupations. It is divided into two levels: Level I accommodates the functionally literate. Corresponds to Grades 0-4; Level II provides remedial skills from approximately Grades 5-8.

Levels III and IV (Career Clusters)

The career cluster programs are designed to provide students with the fundamentals in communications, mathematics and science to enable them to perform the variety of tasks required by the different occupations falling within each career cluster area.

Program Title BASIC TRAINING FOR SKILL DEVELOPMENT
 Code Number 9500 - 000 - 00
 Date January, 1980 (E.M.)

**PROGRAM
DESCRIPTION**
(CONTINUED)

PURPOSE:

Levels III and IV (Career Clusters) (Continued)

Career clusters are grouped according to the following broad occupational families:

- technical/mechanical
- business and commerce/health sciences
- general (for occupations requiring grade equivalency)

Level III corresponds approximately to Grades 9-10. Level IV, the highest level, corresponds approximately to Grades 11-12. The latter provides preparatory skills for some specific occupations. The approved Ministry skill programs requiring Level IV is published annually.

Caution should be observed in equating school grade levels and BTSD levels since grade levels are oriented towards proof of learning ability rather than identification of skills actually needed for work performance.

ENTRANCE REQUIREMENTS:

Pre-tests will determine the trainee's functional level to assist the institution to place the trainee at the appropriate learning level. It also enables the trainee to bypass certain section(s) if he/she can already meet the performance criteria.

Individual trainees will be required to meet specified objectives and their program time will be negotiated taking into consideration the average time required, the time available, prior experiences and learning style.

OCCUPATIONAL OPPORTUNITIES

The career cluster courses will provide entry into the corresponding skill or apprenticeship programs. They also provide the basic communications, mathematics, science and other job-related skills to allow the graduate to begin work in some occupations.

The general BTSD cluster provides entry into those occupations requiring grade equivalency.

AVERAGE DURATION

Duration will vary depending on student aptitude and point of entry.

Maximum duration of government sponsored students on BTSD training is 52 weeks. Maximum permissible time for each level is as follows: LI - 24 weeks; LII - 36 weeks; LIII - 32 weeks; LIV - 32 weeks.

Program Title BASIC TRAINING FOR SKILL DEVELOPMENT
Code Number 9600 - 000 - 00
Date January, 1980

**PROGRAM
DESCRIPTION**
(CONTINUED)

AVERAGE DURATION (Continued)

Duration is open for fee-payers.

The program allows for the individual rate of progress of each student.

The program design facilitates continuous intake and exit of students.

CERTIFICATION

Upon successful completion, the graduate will receive a certificate and a record of his/her performance.

In case of unsuccessful completion or early termination, the trainee will receive a letter of standing indicating work successfully completed.



Ministry
of Training, Colleges
and Universities

Proposal to Modify an MTCU-Funded Program

For assistance in completing this form, refer to the
Policy and Procedure Manual, Programs Section.

1. College

College Sector Committee for Adult Upgrading (CSC)
The CSC is a subcommittee of ACAATO

2. Current program title and APS Number (Provide the MTCU approved title)

Basic Training for Skills Development
CCDO Code 9605-000-00 (sample APS 00066 at Canadore College; each of the 24 colleges has a distinct APS code)

3. Modification(s) proposed (Describe the proposed modification of title, duration, program content, quota or campus of program delivery)

Program name: From Basic Training for Skills Development (BTSD) to Academic and Career Entrance Program (ACE)

Duration: The current approval indicates 32 weeks for BTSD IV. Duration in this modification proposal is provided in terms of contact hours per course.

Program Content: Current BTSD IV approval is very broad: Communications, Mathematics and Science. Proposed modification is more specific and includes Communications, Mathematics (Core, Apprenticeship, Business, Technology), Science (Biology, Chemistry, Physics) and adds Computers and Self Management/Self Direction.

Quota: NA

4. Rationale for the proposed modification(s)

Program Name: The name Basic Training for Skills Development (BTSD) reflected the primary purpose of the program when it was approved in 1967, but there have been significant changes in the educational and employment environment since then. The change to **Academic and Career Entrance** was identified by the Advisory Committee as more accurately reflecting the dual purposes of providing adult students with the necessary academic and personal management skills required to qualify for admission to post secondary programs and/or to secure employment opportunities or improvements. Although BTSD has remained as the name for funding purposes, in reality it has ceased to be used by colleges when advertising or describing the program for potential students. (The use of the term "Basic" has definite negative connotations based on its application in the secondary school system.) It is also the feeling of the advisory committee that the new name and particularly the acronym, ACE, has significant marketing potential for the College system.

Duration: The original approval was for a program funded almost exclusively by the Federal Government on a per diem basis. The guidelines indicate that most students should be able to complete BTSD Levels 1, 2, 3, and 4 in a 52 week period. **The proposed modification is for BTSD IV only.** Hours for each of the 10 courses have been identified as follows: Communications: 150 hours, Self Management/Self Direction: 55 hours, Computers: 110 hours, Biology: 120 hours, Chemistry: 120 hours, Physics: 140 hours, Core Mathematics: 120 hours, Apprenticeship Mathematics: 100 hours, Business Mathematics: 120 hours, and Technology Mathematics: 120 hours

The use of contact hours instead of weeks also reflects changes to delivery since 1967. In 1967, block intakes with minimal individual replacement of drop outs were the norm. Now, the dominant practice is continuous intake and individualized delivery. Students are scheduled for a minimum of 6 hours per week to a maximum of 25 hours. The student, in consultation with the college, determines scheduling. Individual student needs, availability and non-school commitments (family, employment) are taken into consideration.

Graduation requirements: In order to graduate from the program i.e. receive an ACE Certificate, students must complete ACE Communications, one ACE Mathematics course, and any two other ACE courses. The hours required for graduation range from a minimum of 435 hours to a maximum of 530 hours. Hours depend on the ACE courses selected by individual students based on their academic, training, and/or employment goals.

Program Content: Subjects identified in the existing BTSD approval are Communications (Levels 1 – 4), Mathematics Levels 1 – 4) and Science (Levels 3 & 4). These broad descriptions met the training needs of participants in 1967, but since then the postsecondary learning environment and consequently entrance requirements have changed significantly. The program content for the Academic and Career Entrance program reflects the reality that different postsecondary programs require different upgrading courses and academic skills to ensure success in postsecondary. Updated course outlines are attached for the following: Communications, Computers, Self Management/Self Direction, Core Mathematics, Apprenticeship Mathematics, Business Mathematics, Technology Mathematics, Biology, Chemistry and Physics. In 1967, Self Management/Self Direction and Computers were not available or recognized as critical to academic and employment success. The proposed 10 courses reflect the need to individualize training for specific employment and academic goals.

Quota: NA

5. Proposed date of implementation of the modificationApril 1, 2003

6. College contact responsible for this proposal

Name Lynne Wallace
Title Executive Director, College Sector Committee for Adult Upgrading (CSC)
Phone 705-675-2124 or 705 969-2963

7. Required appendices. Refer to the Policy and Procedure Manual, for explanations of information to be included in appendices.For a **title change**, provide **APPENDIX IV** program advisory committee support.For **content changes**, provide **APPENDIX I**, program competencies, courses, and course competencies, and indicate where the changes have been made. Also, provide **APPENDIX IV** program advisory committee support and if appropriate, **APPENDIX II**, evidence of need for the program.For **duration change**, provide **APPENDIX I** program competencies, courses and course competencies, and indicate where changes in either have been made. Also, provide **APPENDIX IV**, program advisory committee support.For **quota change**, provide **APPENDIX II**, evidence of need for the program and **APPENDIX IV**, program advisory committee support. If practical experience facilities are required, identify the facilities to be used and arrangements made for their use and attach as an appendix.

8. Date of board of governors' meeting at which the proposed program modification was approved

9. President's SignatureDate

13-2000 (Rev. 0/00)

Please send five copies of the proposal to: Manager, Program Quality Unit, Colleges Branch, Ministry of Training, Colleges and Universities, 9th Floor, Mowat Block, 900 Bay Street, Toronto, Ontario M7A 1L2

Ministry of Training,
Colleges and Universities
Postsecondary Education
Division

Colleges Branch
Program Quality Unit
9th Floor, Mowat Block
900 Bay St
Toronto ON M7A 1L2
Tel (416) 325-2874
Fax (416) 327-1853
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@edu.gov.on.ca

Ministère de la Formation et des
Collèges et Universités
Division de l'éducation
postsecondaire

Direction des collèges
Unité de la qualité des programmes
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June 29, 2004

Dr. John W. Tibbits
President
Conestoga College Institute of Technology
and Advanced Learning
299 Doon Valley Drive
Kitchener, Ontario
N2G 4M4

Dear Dr. Tibbits:

RE: **PROGRAM MODIFICATION**

Program	-	Academic and Career Entrance ←
CCDO Code	-	9605-000
APS Number	-	00072
Duration	-	415 - 530 Hours
Tuition Short Program Weight	-	1.0
* → Tuition Short Allowance	-	0.1
Effective Date	-	June 29, 2004

The Ministry of Training, Colleges and Universities has reviewed the system-wide proposal, dated June 18, 2003, to modify the Basic Training for Skill Development - Level 4 (BTSD) program by changing the title to Academic and Career Entrance / Accès carrières études (ACE) and changing the delivery from weeks to courses/hours.

Please accept this as approval to offer the modification as proposed.

The approved title, and other information to be included on the approved programs list are also shown above.

Yours sincerely,

Jane Kirkwood
Manager
Program Quality Unit

W. Wilson
CSC

ACE Communications Course Outline 2003 Course Description

Successful learners must be effective communicators in academic, personal and work settings. Effective communicators are able to express themselves well when presenting and defending ideas and opinions by using oral, visual and written forms of communications. Learners who achieve the learning outcomes will have well-developed communication skills that will prepare them for success in a variety of college postsecondary programs. Suggested Length: 150 hours with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes

Throughout this course, learners will:

- Read with Understanding for Various Purposes • Write Clearly to Express Ideas • Speak and Listen Effectively
- Interpret the Media Effectively

Expectations

The Communications course emphasizes consolidation of reading, writing and speaking and listening skills. Learners will be asked to demonstrate their ability to do the following:

- evaluate information, ideas, issues and styles of a variety of informational texts, media works and literary pieces;
- use different sources for gathering information; • select appropriate forms of writing; • choose from a range of organizational structures in producing unified and effective written work; • process and use oral communications effectively; and
- analyze a variety of media works.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation English curriculum in the secondary school. Areas of study include but are not limited to the following:

- Vocabulary development • Technical reading • Analysis of literacy works • Analysis of media forms • Researching information • Note-taking • Summarizing • Technical/business writing (letters, resumes, etc.) • Report and essay writing
- Library/resource use • Oral presentations • Group discussions

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Communications Course Outline 2003 (cont'd)**Units and Specific Outcomes****1.0 Read with Understanding for Various Purposes**

Learners who have successfully completed this unit will have demonstrated their ability to evaluate information, ideas, issues and styles of a variety of informational texts and literary pieces.

1.1 Comprehension

- Select and uses a wide variety of effective reading strategies.
- Apply a variety of strategies to extend vocabulary while reading with an emphasis discerning nuances and judging precision.
- Select and uses specific and significance evidence from texts to support judgments and arguments.

1.2 Interpretation

- Analyze and assess ideas, issues, explicit and implicit information in texts and media works.
- Identify bias in written media works.
- Compares ideas, values and perspectives in texts.
- Analyzes the influence of various factors (social, cultural and/or economic) on the themes and interpretations of texts.

1.3 Forms and Conventions

- Analyze how elements in fictional and non-fictional works are used to enhance or influence meaning.
- Analyze how language is used in expository writing to communicate information and ideas.
- Analyze how authors use a variety of means such as literary devices to enhance meaning in texts.
- Analyze the effect of the author's in a choice of language, syntax and literacy devices on self and others.
- Explain how writers use elements of design to organize information and present ideas.

2.0 Write Clearly to Express Ideas

Learners who have successfully completed this unit will have demonstrated their ability to produce unified and effective written work by using different sources for gathering information, selecting appropriate forms of writing and choosing from a range of organizational structures.

2.1 Research

- Investigate topics for written work by posing questions, and identifying information needs and purposes for writing.
- Develop research plans to acquire information and ideas.
- Gather information from a variety of sources.
- Understand issues surrounding plagiarism.

ACE Communications Course Outline 2003**(cont'd) Units and Specific Outcomes****2.2 Purpose and Form**

- Assess information and ideas from research to determine whether they are sufficient, reliable, credible, and suitable to the form and purpose of the writing.
- Select and use appropriate forms to produce written work (book reports, re-search reports, summaries, short essays, video scripts) for specific audiences and purposes.
- Select and use voice appropriate to purpose and audience.
- Select and use language such as specialized vocabulary and figurative language as appropriate to purpose and audience.

2.3 Organization

- Use appropriate structures and organizational patterns to present information in reports, essays, and expressive writing.
- Revise drafts using editing and proofreading skills to strengthen content and improve organization, precision, expression and effective style.
- Cite research information acceptable research methodology.

2.4 Mechanics

- Use a variety of elements of grammar correctly and effectively.
- Use grammar in unconventional ways for a particular effect.
- Use punctuation correctly to achieve clarity.
- Spell technical and literary terms correctly.
- Confirm spelling of unfamiliar words by using word knowledge and a variety of resources.

ACE Communications Course Outline 2003 (con'd)

Units and Specific Outcomes

1.0 Read with Understanding for Various Purposes	
Learners who have successfully completed this unit will have demonstrated their ability to evaluate information, ideas, issues and styles of a variety of informational texts and literary pieces.	
1.1 Comprehension	<ul style="list-style-type: none"> • Select and uses a wide variety of effective reading strategies. • Apply a variety of strategies to extend vocabulary while reading with an emphasis discerning nuances and judging precision. • Select and uses specific and significance evidence from texts to support judgments and arguments.
1.2 Interpretation	<ul style="list-style-type: none"> • Analyze and assess ideas, issues, explicit and implicit information in texts and media works. • Identify bias in written media works. • Compares ideas, values and perspectives in texts. • Analyzes the influence of various factors (social, cultural and/or economic) on the themes and interpretations of texts.
1.3 Forms and Conventions	<ul style="list-style-type: none"> • Analyze how elements in fictional and non-fictional works are used to enhance or influence meaning. • Analyze how language is used in expository writing to communicate information and ideas. • Analyze how authors use a variety of means such as literary devices to enhance meaning in texts. • Analyze the effect of the author's in a choice of language, syntax and literacy devices on self and others. • Explain how writers use elements of design to organize information and present ideas.
2.0 Write Clearly to Express Ideas	
Learners who have successfully completed this unit will have demonstrated their ability to produce unified and effective written work by using different sources for gathering information, selecting appropriate forms of writing and choosing from a range of organizational structures.	
2.1 Research	<ul style="list-style-type: none"> • Investigate topics for written work by posing questions, and identifying information needs and purposes for writing. • Develop research plans to acquire information and ideas. • Gather information from a variety of sources. • Understand issues surrounding plagiarism.
2.2 Purpose and Form	<ul style="list-style-type: none"> • Assess information and ideas from research to determine whether they are sufficient, reliable, credible, and suitable to the form and purpose of the writing. • Select and use appropriate forms to produce written work (book reports, research reports, summaries, short essays, video scripts) for specific audiences and purposes. • Select and use voice appropriate to purpose and audience. • Select and use language such as specialized vocabulary and figurative language as appropriate to purpose and audience.
2.3 Organization	<ul style="list-style-type: none"> • Use appropriate structures and organizational patterns to present information in reports, essays, and expressive writing. • Revise drafts using editing and proofreading skills to strengthen content and improve organization, precision, expression and effective style. • Cite research information acceptable research methodology.
2.4 Mechanics	<ul style="list-style-type: none"> • Use a variety of elements of grammar correctly and effectively. • Use grammar in unconventional ways for a particular effect. • Use punctuation correctly to achieve clarity. • Spell technical and literary terms correctly. • Confirm spelling of unfamiliar words by using word knowledge and a variety of resources.

ACE Communications Course Outline 2003 (con'd)

Units and Specific Outcomes (continued)

3.0 Speak and Listen Effectively	
Learners who have successfully completed this unit will have demonstrated their ability to process and use oral communications effectively.	
3.1 Presenting	<ul style="list-style-type: none"> • Use an expanded vocabulary appropriate to the topic. • Make effective use of specialized business and technical language. • Use the language structures of standard Canadian English. • Use techniques for making effective oral presentations with a focus on previewing reviewing, summarizing, using parallel structure and sustaining an appropriate tone. • Use props, handouts, charts and technology effectively.
3.2 Interacting	<ul style="list-style-type: none"> • Contribute to and lead discussions • Suggest directions and solve problems with a group. • Connect ideas and arguments to other knowledge. • Make inferences. • Summarize important ideas.
3.3 Listening	<ul style="list-style-type: none"> • Record key information. • Detect assumptions, omissions and perspectives in discussions and oral presentations. • Assess the validity of arguments, evidence and conclusions. • Formulate questions to extend understanding.
4.0 Interpret the Media Effectively	
Learners who have successfully completed this unit will have demonstrated their ability to assess a variety of media works and to create one type of media work.	
4.1 Analysis	<ul style="list-style-type: none"> • Distinguish between explicit and implicit messages in media works • Explain how key elements in media forms are used to influence people. • Explain how different audiences react to different media works • Explore connections between media works/practices with industry codes/government regulations.
4.2 Development	<ul style="list-style-type: none"> • Design or collaborate on the creation of a media work based on knowledge of media works. • Document choices about design and production made during the creation of the media works.

ACE Core Mathematics Course Outline 2003**Course Description**

Successful learners in this program will be able to perform numeric and algebraic operations with and without the use of technology, estimate measurements, collect, display, and analyze data and effectively defend and communicate their solutions.

The general learning outcomes plus the appropriate goal-specific outcomes of this course are prerequisite for students whose goal is grade 12 equivalency in Apprenticeship, Technical, or Business Mathematics. Students seeking the grade 12 equivalency in Mathematics for Everyday Life/Workplace preparation must complete the general learning outcomes and the goal-specific outcomes for Everyday Financing.

Suggested Length: 60 - 90 hours for the general learning outcomes with the understanding that some learners may require additional time to complete the course.
20 – 30 hours for the goal specific outcomes with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes (Units 1, 2, and 3)

Throughout this course, learners will:

- Use mathematical operations and simple algebra.
- Identify relationships among values.
- Apply rules of statistics and probability.

Goal Specific Outcomes (Units 4, 5, 6, and 7)

- Apprenticeship and Technical Math: solve problems involving measurement, geometry, and analytic geometry. (Units 4 and 5)
- Business Math: solve problems involving simple and compound interest (Unit 6)
- Workplace Math: solve problems involving everyday finance applications (Unit 7)

Apprenticeship and Technical Mathematics Goal Specific Expectations (Units 4 and 5)

- Investigate transformational geometry.
- Understand geometric relationships.
- Write equations of relations and identify shapes of their graph.
- Investigate properties of slope.
- Graph and write linear equations.

Business Mathematics Goal Specific Expectations (Unit 6)

- Calculate simple interest.
- Calculate compound interest.
- Compare simple and compound interest applications

Mathematics for Everyday Life (Workplace) Goal Specific Expectations (Unit 7)

- Identify various ways of earning money.
- Understand national and provincial forms of taxation understand purchasing.
- Understand saving and investing understand borrowing.
- Understand costs of owning and operating a vehicle understand travel costs.
- Compare costs of various modes of travel determine costs of renting and buying a house design budgets.

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Core Mathematics Course Outline 2003 (con'd)

Units and Specific Outcomes

Note: Units 1 to 6 are compulsory; units 7 and 8 are elective units, one of which must be completed as determined by the student's goal and in consultation with the professor.

1.0 Number Sense and Algebra	<ul style="list-style-type: none"> • Consolidate and apply numerical skills. • Understand and apply laws of exponents. • Apply scientific notation. • Manipulate polynomial expressions. • Solve first-degree equations including formulas and Pythagorean Theorem. • Use algebraic models (first-degree equations to solve problems). • Communicate solutions and justify reasoning applied.
2.0 Relationships	<ul style="list-style-type: none"> • Pose problems associated with numerical relationships. • Collect data using principles of sampling and surveying. • Organize, display and analyze data appropriately. • Use linear relational graphs to interpolate and extrapolate values. • Describe, in written form, situations that match the events illustrated in various graphs. • Determine whether a relation is linear or non-linear. • Describe conditions that affect the shape of a graph.
3.0 Statistics and Probability	<ul style="list-style-type: none"> • Construct and interpret graphs • Collect and organize data. • Apply principles of probability. • Interpret statements about statistics and probability.
4.0 Measurement and Geometry	<ul style="list-style-type: none"> • Sketch various 2-D and 3-D figures on the 2-D plane. • Investigate maxima and minima for area and volume. • Describe applications of maxima and minima. • Understand and apply the SI (metric) system. • Measure accurately in metric units. • Estimate distances and capacities using metric units. • Solve problems involving area, perimeter, and volume of composite 2-D and 3-D figures. • Judge reasonableness of solutions. • Estimate with reasonable accuracy the perimeter and area of large regions. • Apply transformational geometry. • Investigate geometric relationships.
5.0 Analytic Geometry	<ul style="list-style-type: none"> • Investigate the relationship between the equation of a relation and the shape of its graph. • Investigate the properties of slope.
6.0 Simple and Compound Interest	<ul style="list-style-type: none"> • Calculate simple and compound interest. • Solve applied problems using simple and compound interest.
7.0 Everyday Financing	<ul style="list-style-type: none"> • Identify various ways of earning money. • Explain national and provincial forms of taxation. • Describe purchasing. • Describe saving and investing. • Describe the process of borrowing • Calculate costs of owning and operating a vehicle. • Compare costs of various modes of travel • Determine costs of renting and buying a house. • Design budgets

ACE Apprenticeship Mathematics Course Outline 2003

Course Description

Learners who complete this course successfully will have consolidated their basic mathematical skills, improved their problem-solving techniques, and learned the basics of functions, analytic geometry, and trigonometry. Depending on their longer-term goals, they will also choose two or three of: operating with functions, statistics and probability, personal finance, workplace finance, exponential growth, and applications of sequences and series. These skills will prepare them for various college apprenticeship programs, and/or for the workplace.

Suggested Length: 100 hours with the understanding that some learners may require additional time to complete the course.

Prerequisite: Core Mathematics (general learning outcomes and Apprenticeship and Technical goal-specific outcomes)

General Learning Outcomes

Throughout this course, learners will:

- Solve mathematical problems using a variety of appropriate strategies.
- Use basic number concepts to solve practical problems and as a foundation for advanced concepts.
- Use algebraic notation, axioms, and modelling in solving problems and as a foundation for advanced concepts
- Manage and interpret statistical data.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation chemistry curriculum in the secondary school. Areas of study include but are not limited to the following:

Core Course Content (compulsory units of study)

- Number Sense and Algebra
- Measurement and Geometry
- Proportional Reasoning
- Analytic Geometry
- Relations and Functions
- Trigonometric Functions

Elective Course Content (1 out of 2 units of study)

- Statistics and Probability
- Personal and Workplace Finance

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Apprenticeship Mathematics Course Outline 2003 (con'd)

Units and Specific Outcomes

Note: Units 1 to 6 are compulsory; units 7 and 8 are elective units, one of which must be completed as determined by the student's goal and in consultation with the professor.

1.0 Number Sense and Algebra	<ul style="list-style-type: none"> • Perform operations on polynomials. • Expand and simplify polynomial expressions involving several variables. • Solve first degree equations, including equations with fractional coefficients, using an algebraic method • Manipulate scientific formulae. • Substitute into formulae and solve for one variable, with and without the help of technology. • Use algebraic modelling to solve problems in various topics, e.g. relations, measurement, direct, partial and joint variation. • Communicate solutions to problems in appropriate mathematical forms, e.g. written explanation, formulae, charts, tables, graphs. • Justify the reasoning used in solving problems.
2.0 Measurement and Geometry	<ul style="list-style-type: none"> • Estimate, with reasonable accuracy, distances and capacities in metric and Imperial units • Estimate, with reasonable accuracy, large numbers. • Judge the reasonableness of answers produced by a calculator, a computer, or manual calculation, using mental mathematics and estimation. • Solve problems involving the properties of the interior and exterior angles of triangles and quadrilaterals, and of angles related to parallel lines. • Communicate the solutions, using appropriate language and mathematical forms, e.g. written explanations diagrams, formulae, tables.
3.0 Proportional Reasoning	<ul style="list-style-type: none"> • Solve problems involving percent, ratio, rate. • Solve problems involving direct, inverse and joint proportions. • Solve problems with similar triangles in realistic applications.
4.0 Analytic Geometry	<ul style="list-style-type: none"> • Determine the characteristics that distinguish the equation of a straight line from the equations of non-linear relations. • Use graphing software to obtain graphs. • Classify relations according to the shapes of their graphs. • Identify $y = mx + b$ and $ax + by + c = 0$ as standard forms of linear equations, including the special cases $x = a$, $y = b$. • Identify $y = ax^2 + b$ as a standard form of a quadratic equation.
5.0 Relations and Functions	<ul style="list-style-type: none"> • Expand and simplify polynomials involving multiplication and squaring of binomials. • Factor polynomials including difference of squares, incomplete square, and sum and difference of cube. • Solve quadratic equations by factoring, using the remainder theorem and factor theorem. • Use systems of linear equations to solve workplace-related problems. • Construct graphs of quadratic functions whose equations are given the form $y = a(x - h)^2 + k$, or $y = ax^2 + bx + c$. • Obtain graphs of quadratic functions whose equations are given the form $y = a(x - h)^2 + k$, or $y = ax^2 + bx + c$ using graphing software. • Determine the maxima and minima of quadratic functions using a calculator or graphing software. • Identify the effect of simple transformations on the graph and the equation of $y = x^2$.
6.0 Trigonometric Functions	<ul style="list-style-type: none"> • Define the primary and secondary trigonometric ratios of angles, using the sides in right triangles • Demonstrate an understanding of the signs of these ratios for obtuse angles. • Solve problems involving the sides and angles in right triangles using primary trig ratios. • Solve problems involving the side and angles of oblique triangles, using the sine law and the cosine law.
7.0 Statistics and Probability	<ul style="list-style-type: none"> • Collect and organize data. • Identify and apply measures of central tendency. • Display data using appropriate graphical representations. • Interpret data from a variety of sources. • Apply principles of probability in a variety of applications
8.0 Personal and Workplace Finance	<ul style="list-style-type: none"> • Solve problems involving various ways of earning money, e.g. salary, hourly rate, overtime, commission, using calculator or appropriate software. • Solve problems involving the estimation and calculation of various taxes. • Estimate and calculate discounts, sale prices, and after-tax costs. • Identify, calculate, and compare the interest costs involved in making purchases under various plans, e.g. installment, layaway, credit card, credit line. • Explain the overhead and fixed costs involved in operating a small business.

ACE Business Mathematics Course Outline 2003**Course Description**

This course provides students with the mathematical skills needed to perform business operations. It builds a strong foundation for students moving on to further study and training in specialized Business Studies. It will also provide practical skills for those who wish to move directly into the world of business.

Suggested Length: 100 hours with the understanding that some learners may require additional time to complete the course.

Prerequisite: Core Mathematics (general learning outcomes and Business goal-specific outcomes)

General Learning Outcomes

Throughout this course, learners will:

- Apply algebraic skills, manipulate algebraic formulas, and improve problem-solving skills.
- Use estimation in a variety of applications, solve problems involving measurement, and judge solutions for reasonableness and accuracy.
- Manipulate ratios and proportions, and apply them in the solution of various problems.
- Determine the relationship between the form of an equation and the shape of its graph (linear or quadratic).
- Graph linear and non-linear relations, and describe the connections between various representations of relations.
- Manipulate trigonometric ratios of any angle, and solve problems involving these ratios.
- Collect, organize, display, analyze and interpret data; apply probability to a variety of situations.
- Solve problems involving various forms of remuneration and taxation; investigate saving and investments, borrowing, and purchasing of items.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation mathematics curriculum in the secondary school. Areas of study include but are not limited to the following:

Exponential Growth:

- Broaden understanding of exponential growth as it applies to personal finance
- Investigate properties of exponential functions
- Manipulate exponential expressions
-

Solve problems and investigate financial applications involving:

- Simple Interest
- Compound Interest
- Annuities
- Retail-buying, selling, and commission

Apply Mathematics in making informed decisions about

- Transportation
- Accommodation

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Business Mathematics Course Outline 2003 (con'd)

Units and Specific Outcomes

1.0 Exponential Growth	<ul style="list-style-type: none"> • Describe the significance of exponential growth or decay. • Identify exponential growth or decay using tables of values, graphs or equations. • Sketch graphs of exponential functions. • Use graphing software or graphing calculator to investigate the properties of exponential functions including range, domain, increasing or decreasing through domain, asymptotes. • Manipulate exponential expressions.
2.0 Arithmetic and Geometric Sequences and Series	<ul style="list-style-type: none"> • Determines terms that follow three or more given terms in a sequence. • Distinguish whether a sequence is arithmetic, geometric or neither. • Solves problems using formulas for the nth term and sum of n terms of Arithmetic & Geometric sequences and series.
3.0 Simple and Compound Interest	<ul style="list-style-type: none"> • Calculates Simple & Compound Interest • Solve questions for any variable of equation $I=Prt$ using a scientific calculator. • Calculate A or P in formula $A = P(1+It)^n$ using a scientific calculator • Calculate I or n in formula $A = P(1+It)^n$ using a spreadsheet. • Identify relationship between simple interest, arithmetic sequences, and linear growth. • Solve problems related to the relationship between compound interest, geometric sequences and exponential growth.
4.0 Retail Sales	<ul style="list-style-type: none"> • Apply formulas to solve complex word problems involving discounts, markups, markdowns, profit and loss.
5.0 Annuities	<ul style="list-style-type: none"> • Calculate present value and periodic payment of a regular annuity using a scientific calculator. • Generate an amortization table using a spreadsheet or other software.
6.0 Organizing and Analyzing Data	<ul style="list-style-type: none"> • Generate questions that have a finite number of responses for own investigation. • Collect data on relevant information related to the alternatives to be considered in making a decision. • Compare alternatives by rating and ranking information and by applying mathematical calculations and analysis. • Summarize and present data in various formats (tables, charts, graphs, calculations, explanatory notes). • Make inferences and convincing arguments based on data analysis.

ACE Technical Mathematics Course Outline 2003

Course Description

The Technical Mathematics course builds on and expands the fundamental algebraic skills mastered in Core Mathematics. Calculators and/or appropriate software are an integral part of the course. The objective of the course is to prepare students to have the necessary mathematical skills to prepare for mathematics-focused college postsecondary programs. Students who have successfully achieved the learning outcomes will be able to apply their skills to solve applied problems involving trigonometry, polynomial/rational/exponential expressions, polynomial/exponential/logarithmic functions, and the principles of geometry and measurement.

Suggested Length: 120 hours with the understanding that some learners may require additional time to complete the course.

Prerequisite: Core Mathematics (general learning outcomes and Apprenticeship and Technical goal specific outcomes)

General Learning Outcomes

In this course, learners will:

- Use computation and algebraic manipulation.
- Use measurement for various purposes and solve geometry problems.
- Solve problems involving trigonometry.
- Analyze models of a variety of functions.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation mathematics curriculum in the secondary school. Areas of study include but are not limited to the following:

- Polynomials and Factoring
- Linear Equations
- Systems of Equations
- Rational Expressions
- Radicals/Complex Numbers
- Quadratics
- Logarithms
- Trigonometry

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Technical Mathematics Course Outline 2003 (con'd)

Units and Specific Outcomes

1.0 Monomials, Polynomials, and Factoring	<ul style="list-style-type: none"> • Simplify algebraic expressions • Factor polynomials
2.0 Equations in One Variable and Formulas	<ul style="list-style-type: none"> • Create and solve algebraic equations in one variable. • Manipulate formulas.
3.0 Systems of Equations	<ul style="list-style-type: none"> • Determine the point of intersection of linear equations. • Solve problems of linear equations in two variables. • Solve equations in three variables. • Solve applied problems.
4.0 Fractional Expressions and Equations	<ul style="list-style-type: none"> • Simplify rational expressions. • Solve rational equations. • Solve problems involving fractional equations
5.0 Radicals and Complex Numbers	<ul style="list-style-type: none"> • Apply the laws of exponents to simplify expressions. • Manipulate algebraic expressions.
6.0 Quadratics	<ul style="list-style-type: none"> • Demonstrate a working knowledge of quadratic equations • Determine the relationship between the equations and the graph of quadratic functions. • Solve problems involving quadratic equations.
7.0 Logarithms and Functions	<ul style="list-style-type: none"> • Apply logarithmic functions • Demonstrate an understanding of exponential growth and decay. • Demonstrate facility in the use of function notation. • Demonstrate the manipulation of algebraic expressions • Demonstrate an understanding of proportionality.
8.0 Trigonometry	<ul style="list-style-type: none"> • Demonstrate the use of radian measure in solving equations and graphing. • Solve problems involving trigonometry with triangles. • Determine the relationships between the graphs and the equations of sinusoidal functions.
9.0 Measurement and Geometry	<ul style="list-style-type: none"> • Demonstrate an understanding of the relationship between three-dimensional objects and their two-dimensional representations. • Use measurement in a variety of ways. • Solve geometry problems.

ACE Biology Course Outline 2003

Course Description

This biology course provides learners with a strong knowledge of biology as it applies to health, social and environmental issues. Emphasis is given to analyzing problems, performing laboratory exercises and communicating scientific information effectively. The content of the course reflects the needs of many adult learners entering postsecondary college programs in health and environmental sciences. As such, it allows learners to complete five out of a possible six units of study.

Suggested Length: 120 hours with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes

Throughout this course, learners will:

- Employ, individually and in groups, a disciplined approach to the processes of biology including scientific inquiry, problem solving and design.
- Apply biology concepts and principles in such areas as the study of cells, microbiology, human anatomy and physiology, plant structure and physiology and environmental science.
- Apply knowledge of the content to health, workplace, societal, and environmental biology issues.
- Select and use appropriate numeric, symbolic, graphical and linguistic modes to represent and communicate scientific concepts and experimental results.
- Assess career choices in science and technology
- Perform various laboratory activities (real-time or virtual) in accordance with laboratory, college and legislated safety procedures.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation biology curriculum in the secondary school. Areas of study include but are not limited to the following:

- Cell biology - cell theory, structure/function of organelles, cellular processes, transport mechanisms
- Microbiology - anatomy, physiology, reproduction and genetic composition of representative organisms from the monera, protists, fungi and bacteria; viruses; genetic manipulation; symbiotic relationships involving micro-organisms
- Human anatomy and physiology - human systems such as nervous, skeleto-muscular, digestive, cardiovascular, reproductive, endocrine, etc.; pathophysiology of those systems; homeostasis
- Plant structure and physiology - classification of plants, life cycle, growth and differentiation, role of tropisms
- Environmental science - principles of taxonomy, energy pyramids, symbiotic relationships, biogeochemical cycles, ecosystems, population growth biomes

Related laboratory activities (virtual or real-time) may be included pertaining to the above topics.

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Biology Course Outline 2003 (con'd)

Units and Specific Outcomes

Note: any five of six units are required for course completion as determined by the learner's goal.

1.0 Cellular Biology	<ul style="list-style-type: none"> • List the main points of the cell theory. • Explain the functions of organelles. • Identify and describe the 4 major biochemical compounds. • Describe the role of enzymes in biochemical reactions. • Define various transport processes across cell membranes. • List the features of each stage of mitosis. • Compare respiration and photosynthesis. • Apply knowledge of cellular processes to a personal or medical issue.
2.0 Microbiology	<ul style="list-style-type: none"> • Compare representative bacteria, protists, viruses and fungi in terms of shape, motility, role and connection to human disease. • Describe different modes of reproduction in micro-organisms. • Compare the genetic material of viruses and bacteria with those of eukaryotic cells. • Identify the symbiotic roles of micro-organisms. • Illustrate some uses of viruses and bacteria in biotechnology and genetic engineering. • Evaluate the implications of viral, bacterial and fungal infections on a human host.
3.0 Human Anatomy and Physiology I	<ul style="list-style-type: none"> • Define the levels of organization from cells through to systems • Describe the anatomy and physiology of the following systems: musculo-skeletal, circulatory, nervous, endocrine, reproductive. • Explain the causes, symptoms and treatments of major disorders of the above systems. • Define homeostasis. • Explain the role of the endocrine system and central nervous system in maintaining homeostasis. • List the features of each stage of meiosis. • Apply principles of genetics to solve simple patterns of inheritance.
4.0 Human Anatomy and Physiology II	<ul style="list-style-type: none"> • Describe the anatomy and physiology of the following systems: respiratory, digestive, excretory, and lymphatic. • Explain the causes, symptoms and treatments of major disorders of the above systems. • Describe the composition of blood. • Identify ABO blood types based on antigen/antibody presence. • Explain the roles of various types of white blood cells with respect to the immune response.
5.0 Plant Structure and Physiology	<ul style="list-style-type: none"> • Illustrate how plants are classified by identifying characteristics. • Describe the structure and physiology of plant tissues. • Explain the steps in the life cycle of a plant. • Differentiates between major divisions of plants. • Describe the processes of growth and differentiation in plants. • Explain the role of tropisms in plants. • Identify the importance of plant diversity in maintaining ecosystems. • Outline the use of plants in various industries (food, textile, etc.). • Explain the role of aquatic plants in the purification of waste or run-off water.
6.0 Environmental Science	<ul style="list-style-type: none"> • Demonstrate an understanding of taxonomy by classifying organisms from a local ecosystem • Use energy pyramids to explain the mechanisms and interactions of a food chain. • Explain the ecological role of representative organisms from each of the kingdoms of life. • Describe the flow of matter through the biogeochemical cycles (carbon, nitrogen, phosphorus and water cycles). • Define population growth and the factors influencing it. • Analyze a local environmental issue.

ACE Biology Course Outline 2003 (con'd)

Laboratory Component

NOTE: Program managers were surveyed in July 2002 regarding feasibility of real-time lab offerings for OBS IV/BTSD 4 sciences. Since the availability of such a lab component varies among the colleges, the use of virtual lab activities may be an option for some colleges. A preliminary list of virtual resources is included following this chart. Those resources have not yet been reviewed but are meant as a starting point to assist identifying appropriate virtual resources.

General Outcomes for Laboratory Component	<ul style="list-style-type: none"> • Complete laboratory activities in an organized and safe manner. • Recognize and identify common laboratory equipment and apparatus. • Record complete, objective observations. • Use a variety of measuring devices. • Performs accurate measurements utilizing the correct number of significant digits. • Create tables and graphs from data collected. • Use experimental results to lead to conclusions and interpretations of data. • Identify the importance of controlled conditions during experimentation.
1.0 Cellular Biology	<ul style="list-style-type: none"> • Determine factors affecting rates of diffusion across various membranes. • Prepare a wet mount of a stained specimen. • Investigate the effect of environment on enzyme action. • Conduct tests to identify macromolecules.
2.0 Microbiology	<ul style="list-style-type: none"> • Identify various specimens using prepared slides. • Prepare a culture of micro-organisms on agar using aseptic techniques. • Design and conduct an experiment to determine the effect of an antibacterial agent on a bacterial culture.
3.0 Human Anatomy and Physiology I	<ul style="list-style-type: none"> • Use various instruments to collect data on human conditions such as heart rate, blood pressure, pulse. • Design and conduct an experiment related to human physiology, i.e. the effect of breathing patterns during exercise on heart rate. • Perform a dissection of a vertebrate to identify organs and the relationship between structures and their functions.
4.0 Human Anatomy and Physiology II	<ul style="list-style-type: none"> • Survey and analyze the eating habits of a sample group in terms of potential health issues. • Design and conduct an experiment related to human physiology, i.e. the effect of breathing patterns during exercise on heart rate. • Perform a dissection of a vertebrate to identify organs and the relationship between structures and their functions.
5.0 Plant Structure and Physiology	<ul style="list-style-type: none"> • Investigate tropisms by growing plants from seed. • Distinguish between monocot and dicot plants, using appropriate instruments and sources.
6.0 Environmental Science	<ul style="list-style-type: none"> • Investigate and explain how a change in one population can affect the entire food web. • Investigate the effect that human population growth has on the environment and the quality of life of the affected ecosystem.

ACE Chemistry Course Outline 2003

Course Description

This Chemistry course provides learners with a strong knowledge of chemistry as it applies to industry and environmental issues. Emphasis is given to analyzing problems, performing laboratory exercises and communicating scientific information effectively. The content of the course reflects the needs of many adult learners entering postsecondary college programs in health and environmental sciences. As such, it allows learners to complete three core units and two elective units of study.

Suggested Length: 120 hours with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes

Throughout this course, learners will:

- Employ, individually and in groups, a disciplined approach to the processes of biology including scientific inquiry, problem solving and design.
- Apply biology concepts and principles in such areas as the study of cells, microbiology, human anatomy and physiology, plant structure and physiology and environmental science.
- Apply knowledge of the content to health, workplace, societal, and environmental biology issues.
- Select and use appropriate numeric, symbolic, graphical and linguistic modes to represent and communicate scientific concepts and experimental results.
- Assess career choices in science and technology
- Perform various laboratory activities (real-time or virtual) in accordance with laboratory, college and legislated safety procedures.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation chemistry curriculum in the secondary school. Areas of study include but are not limited to the following:

Core Course Content (compulsory units of study)

- Nature of matter - atomic theory, sub-atomic particles, periodic table, Lewis structures, ions, elements, compounds
- Qualitative analysis - observations and inferences, processes, Bohr model, bonding, spectroscopy
- Chemical calculations - mole concept, chemical equations, experimental error, percentage composition, stoichiometry, percentage yield, industry and everyday applications

Elective Course Content (2 out of 3 units of study)

- Electrochemistry - galvanic and electrolytic cells, redox reactions, corrosion, conductance, displacement reactions, electrochemical cells, industry and everyday applications
- Organic chemistry - characteristics of carbon, properties of molecules, functional groups, organic reactions, distillation, industry applications
- Chemistry in the environment - properties of gases, acids and bases, acid rain, air quality, societal and economic implications

Related laboratory activities (virtual or real-time) may be included pertaining to the above topics.

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Chemistry Course Outline 2003 (con'd)

Units and Specific Outcomes

Note: Units 1, 2, and 3 are compulsory; units 4, 5, and 6 are elective units, two of which must be complete as determined by learner's goal.

1.0 Nature of Matter	<ul style="list-style-type: none"> Define and classify matter. Distinguish between physical and chemical properties. Identify the key points of Dalton's atomic theory. Name the three basic sub-atomic particles and lists their properties. Draw Lewis structures. Distinguish between elements, compounds and ions. Describe the periodic classification of the elements. Recognize trends within the periodic table.
2.0 Qualitative Analysis	<ul style="list-style-type: none"> Explain the difference between observation and inference. Describe the basic processes in qualitative analysis (flame tests, precipitation reactions, and absorption spectra). Use Lewis structures to illustrate covalent and ionic bonding. Relate the charge on an ion to electron loss or gain. Use a solubility table to predict precipitate formation. Write double displacement and net ionic equations. Name inorganic compounds using the rules of nomenclature. Write chemical formulas for molecules and compounds.
3.0 Chemical Calculations	<ul style="list-style-type: none"> Identify types of chemical reactions. Write balanced equations. Define the mole concept. Calculate formula and molecular masses. Explain how the following variables are related: coefficients in balanced chemical equations, molar quantities, mass and number of particles. Solve problems involving moles, molar mass and Avogadro's number. Solve problems involving mole, mass, and volume calculations in chemical equations. Calculate percentage yield. Identify sources of experimental error.
4.0 Electrochemistry	<ul style="list-style-type: none"> Name the components of galvanic and electrolytic cells. Describe the role of galvanic and electrolytic cells in terms of oxidation and reduction. Explain the chemical reactions involved in corrosion. Relate the chemistry of corrosion to the chemical reactions in an electrochemical cell. Describe various techniques used to prevent corrosion of metals.
5.0 Organic Chemistry	<ul style="list-style-type: none"> Describe the characteristics of the carbon atom in terms of bonding and the formation of long chain molecules. Explain the general properties of molecules containing oxygen or nitrogen. Identify the structures of the functional groups that define their common families i.e. alkanes, alkenes, alcohols, etc. Draw Lewis structures to represent covalent bonding in organic compounds. Describe, with the use of structural formulas, organic reactions such as addition, combustion, polymerization.
6.0 Chemistry in the Environment	<ul style="list-style-type: none"> List the characteristics of gases. States the effect of temperature and pressure on a fixed quantity of gas. Explain the Arrhenius definition of acids and bases. Differentiate between strong and weak acids with respect to dissociation. Write balanced chemical equations for neutralization reactions. Identify the gases responsible for acid rain and their sources. Apply the definitions of concentrated and dilute to acids. Identify substances in environmental water whose concentration must be controlled to ensure the water is fit for human consumption and use.

ACE Chemistry Course Outline 2003 (con'd)

Laboratory Component

NOTE: Program managers were surveyed in July 2002 regarding feasibility of real-time lab offerings for OBS IV/BTSD 4 sciences. Since the availability of such a lab component varies among the colleges, the use of virtual lab activities may be an option for some colleges. A preliminary list of virtual resources is included following this chart. Those resources have not yet been reviewed but are meant as a starting point to assist identifying appropriate virtual resources.

General Outcomes for Laboratory Component	<ul style="list-style-type: none"> • Complete laboratory activities in an organized and safe manner. • Recognize and identify common laboratory equipment and apparatus. • Record complete, objective observations. • Use a variety of measuring devices. • Perform accurate measurements utilizing the correct number of significant digits. • Create tables and graphs from data collected. • Use experimental results to lead to conclusions and interpretations of data. • Identify the importance of controlled conditions during experimentation.
1.0 Nature of Matter	<ul style="list-style-type: none"> • Construct molecular models using a kit. • Investigate the chemical properties of representative families of elements (e.g., combustibility, reaction with water of Mg, Ca or C, Si). • Investigate the properties of changes in substances, and classify them as physical or chemical based on experiments (e.g., solubility, combustibility, change of state, changes in colour).
2.0 Qualitative Analysis	<ul style="list-style-type: none"> • Determine the presence of ions in an unknown sample i.e. a household chemical, using flame tests and precipitate reactions. • Conduct qualitative analysis using such equipment as gas discharge tubes, centrifuge and spectroscope. • Identify an unknown gas sample by comparing its observed absorption spectra with known spectra of known gases.
3.0 Chemical Calculations	<ul style="list-style-type: none"> • Prepare aqueous solutions, using appropriate concentration units. • Dilute a stock solution to a specified concentration.
4.0 Electrochemistry	<ul style="list-style-type: none"> • Construct a galvanic cell and assess its advantages and disadvantages in terms of portability, rechargability, chemical spillage, etc. • Design and carry out procedure to determine the factors that affect the rate of corrosion i.e. stress, two-metal contacts, nature of electrolyte, etc.
5.0 Organic Chemistry	<ul style="list-style-type: none"> • Determine the physical and chemical properties of some common organic compounds i.e. solubility, conductivity, odour. • Identify trends based on those properties. • Synthesize a condensation product i.e. aspirin or an ester, a common organic compound (soap).
6.0 Chemistry in the Environment	<ul style="list-style-type: none"> • Determine acidity of common household substances using an indicator. • Conduct an acid-base titration to determine concentration of an acid or a base. • Determine the concentration of dissolved ions i.e. calcium ions in a water sample using gravimetric and colourimetric analysis.

ACE Physics Course Outline 2003

Course Description

This physics course will enable the learners to develop the basic concepts of physics. Learners will study and explore concepts related to dynamics, forces, energy, mechanics, electricity and fluids. They will apply these concepts and principles to solve applied problems while communicating the scientific and technical information and evaluating the impact of physics on society and the environment. The content of the course reflects the needs of many adult learners entering postsecondary college programs in technology and related fields. As such, it allows learners to complete three core units and two elective units of study.

Suggested Length: 140 hours with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes

Throughout this course, learners will:

- Apply physics concepts and principles to solve problems.
- Communicate scientific and technical information effectively and perform laboratory activities.
- Evaluate the implication of physics and its application to personal, workplace, societal, and global issues.

Content

The content of the course is shaped both by the demands at the postsecondary college level and the college preparation physics curriculum in the secondary school. Areas of study include but are not limited to the following:

Core Course Content (compulsory units of study)

- Forces and Motion
- Work, Energy, Power and Machines
- Light and Optics

Elective Course Content (2 out of 3 units of study)

- Electricity and Magnetism
- Waves and Sound
- Hydraulic and Pneumatic Systems

Related laboratory activities (virtual or real-time) may be included pertaining to the above topics.

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Physics Course Outline 2003 (con'd)

Units and Specific Outcomes

1.0 Forces and Motion	<ul style="list-style-type: none"> • Differentiate between scalar and vector quantities. • Use vector diagrams to analyze uniform motion in two dimensions. • Combine vector quantities graphically to solve motion and force problems. • Analyze the gravitational force acting on an object near, and at a distance from, the surface of the earth. • Analyze the forces acting on an object and determine the acceleration of the object. • Apply Newton's three laws of motion to explain straight line motion. • Analyze the relationship among the net force acting on an object, its mass, and its acceleration to discover Newton's laws. • Explain the difference between uniform and non-uniform motion • Define and specify units for displacement, velocity, uniform acceleration, average and instantaneous acceleration. • Solve problems of uniform motion involving displacement, velocity, acceleration, and time.
2.0 Work, Energy, Power, and Machines	<ul style="list-style-type: none"> • Define and specify units and solve problems involving force, displacement, and work. • Define and specify units and solve problems involving power, work, and time. • Define and specify units and solve problems involving potential energy and kinetic energy. • Apply the law of Conservation of Energy to relate work, kinetic energy, and potential energy. • Analyze the relationships among percent efficiency, input energy, and output energy. • Define and specify the units for force, coefficients of frictions, torque, mechanical advantage, and work. • Identify and give practical examples of simple machines (inclined plane, wedge, screw, pulley, wheel and axle). • State the law of the lever and apply it to solve related problems. • Name the three classes of levers and give practical examples of each.
3.0 Light and Optics	<ul style="list-style-type: none"> • Define and specify the units related to the concepts of light • Use Snell's Law to indicate how the velocity and wavelength of light depend on the index of refraction. • Use ray diagrams to explain total internal reflection. • Use ray diagrams to illustrate the characteristics and positions of images formed by lenses. • Solve problems for distance, size of image, or size of object using the lens equation.
4.0 Waves and Sound	<ul style="list-style-type: none"> • Define and specify the units of mechanical wave concepts. • Define periodic motion and describe energy transfer by wave motion. • Describe with the aid of diagrams sound waves in air, sound characteristics, and velocity/wavelength/frequency relationships. • Compare the speed of sound in different media, and describe the effect of temperature on the speed of sound. • Describe what happens to speed and wave motion as a wave passes from one medium to another. • Apply the knowledge of mechanical resonance to sound. • Explain interference and diffraction of sound waves.
5.0 Electricity and Magnetism	<ul style="list-style-type: none"> • Define and specify the units of electric charge, electric current, electric potential, electric flow, magnetic field, electromagnetic induction. • Apply the right hand rule to determine the magnetic field produced when electric current flows through a long straight conductor and a solenoid. • Explain the factors that affect the force on a current-carrying conductor in a magnetic field. • Apply Lenz's law to applicable problems. • Compare DC and AC and electrical systems. • Solve problems involving voltage, current, power, time. • Describe the function of basic circuit components. • Analyze circuit problems involving potential difference, current and resistance. • Distinguish between analog and digital circuits.
6.0 Hydraulic and Pneumatic Systems	<ul style="list-style-type: none"> • Use the concepts and units related to fluids to solve applicable problems. • State Bernoulli's principle and describe practical applications. • State Pascal's principle and explain how it applies to brakes, lifts, etc. • Describe common components used in hydraulic and pneumatic systems. • Solve applied problems using the relationships among force, area, pressure, volume and time in hydraulic and pneumatic systems.

ACE Computer Skills Course Outline 2003

Course Description

This course prepares learners to perform basic computer skills needed to succeed in further studies as well as providing practical skills for those who wish to move directly to the world of work. It enables students to create documents, navigate the Internet to conduct research and communicate in educational, workplace and personal settings.

Suggested Length: 110 hours with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes

- Students who have successfully completed this course will have demonstrated their ability to use success strategies that promote lifelong learning and that can be applied in their personal, employment and academic lives.

Expectations

- Learn and use appropriate computer terminology.
- Recognize and perform basic tasks required to operate a computer.
- Develop basic keyboard mastery, speed and accuracy using an electronic keyboard.
- Use appropriate functions of one or more operating systems and apply them to application programs.
- Use word processing software to produce documents for academic, vocational and personal use.
- Produce and manipulate spreadsheets in order to perform basic financial analysis and calculations.
- Use an operating system to manage files.

Content

The content of the course is shaped by the demands and expectations at the postsecondary level and in the workplace. Areas include but are not limited to the following:

- Software applications
- Creation of documents
- Electronic file management
- Electronic research
- Electronic communication

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Computer Skills Course Outline 2003 (con'd)

Units and Specific Outcomes

1.0 Software Applications	<ul style="list-style-type: none"> • Demonstrate the use of software. • Demonstrate the use of software features that facilitate the joint production of documents.
2.0 Creation of Documents	<ul style="list-style-type: none"> • Produce correctly formatted documents from printed, handwritten and revised copies.
3.0 Electronic File Management	<ul style="list-style-type: none"> • Demonstrate an understanding of the different processes for managing electronic data.
4.0 Electronic Communication	<ul style="list-style-type: none"> • Communicate with others using electronic tools.
5.0 Electronic Research	<ul style="list-style-type: none"> • Use electronic media to gather information for a particular purpose. • Use electronic tools to collect information required to solve a specific problem.
6.0 Ethical Issues related to Information Technology	<ul style="list-style-type: none"> • Demonstrate an understanding of ethical business practices related to the use of information technology.

ACE Self-Management/Self-Direction Course Outline 2003

Course Description

The Self-Management/Self-Direction course provides students with an opportunity to learn and use success strategies that can be applied to their academic, employment and personal life. The strategies will equip them with the knowledge, skills and behaviours to become effective, confident and flexible learners. The course will focus on areas such as self-reflection, critical thinking, goal setting, study skills, organizational skills, group dynamics and career/employment exploration.

Suggested Length: 55 hours with the understanding that some learners may require additional time to complete the course.

General Learning Outcomes

- Students who have successfully completed this course will have demonstrated their ability to use success strategies that promote lifelong learning and that can be applied in their personal, employment and academic lives.

Expectations

- Demonstrate a variety of self-assessment and self-reflection techniques.
- Use systematic methods to solve problems and make decisions
- Demonstrate responsibility in their role as a learner.
- Formulate achievable educational, employment and personal goal.
- Use efficient learning strategies to facilitate the learning process.
- Use organizational techniques and approaches to meet deadlines.
- Work effectively with other students on an individual basis and in a group setting.
- Demonstrate knowledge and use of college structure, supports and resources.
- Demonstrate knowledge of community resources, structures and supports.
- Embrace the belief that learning continues for life.

Content

The content of the course is shaped by the demands and expectations at the postsecondary level and in the workplace. Areas include but are not limited to the following:

- Study skills (develop learning strategies, analyze learning styles, note taking, reading text books techniques for writing exams)
- Development of a training plan (setting long and short term goals)
- Career preparation (achieving -long term goal success)
- Time-management strategies
- Stress-management approaches
- Interaction with others in groups or teams in ways that contribute to effective working relationships and goals
- Use of the library
- Development and implementation of an innovative job search strategy
- Conflict resolution techniques
- Participation in college and community events.
- Networking

Evaluation for the Course

The methods and weightings of assessments and evaluation are determined by individual colleges.

ACE Self-Management/Self-Direction Course Outline 2003 (con'd)

Units and Specific Outcomes

1.0 Self-awareness	<ul style="list-style-type: none"> • Demonstrates a variety of self-reflection and self-assessment techniques.
2.0 Critical Thinking	<ul style="list-style-type: none"> • Uses systematic methods to analyze information, solve problems, and make decisions.
3.0 Responsibility for Self	<ul style="list-style-type: none"> • Demonstrates responsibility in role of learner.
4.0 Goal Setting	<ul style="list-style-type: none"> • Formulates achievable educational, employment, and personal goals.
5.0 Developing Strategies for Learning and Employment	<ul style="list-style-type: none"> • Uses efficient strategies to facilitate the learning process and to find suitable employment.
6.0 Organizational Skills	<ul style="list-style-type: none"> • Uses organizational techniques and approaches to meet deadlines.
7.0 Working with Others	<ul style="list-style-type: none"> • Works effectively with other students on an individual basis and in a group setting.
8.0 Maximizing the College Experience	<ul style="list-style-type: none"> • Demonstrates knowledge and use of college structure, supports and resources
9.0 Community Involvement	<ul style="list-style-type: none"> • Demonstrates knowledge of community resources, structures and supports.
10.0 Lifelong Learning	<ul style="list-style-type: none"> • Embraces the belief that learning continues for life.



Algonquin College of Applied Arts and Technology

by virtue of authority vested in its Board of Governors by the Province of Ontario, Canada
has conferred this certificate to

who has successfully completed the following
program

Academic and Career Entrance

C. Pearson
President



[Signature]
Registrar

Signed and sealed at Ottawa, Ontario this 9th day of January 2018

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	Version: 1.0
	Page: 1 of 4
OOB Procedure Reference:	

http://cscportal.edu.gov.on.ca/sites/ORUportal/Pages/apprenticeship/OOR/oor_apprentices.aspx?source=thanks.aspx

1.0 Revision History

April 08, 2013	1.0	New document
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2.0 Parties Affected

Applicants for an apprenticeship program

3.0 Legislative/Regulatory References

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_09o22_e.htm

Ontario College of Trades and Apprenticeship Act, 2009 (OCTAA)

Section 64 – Functions

Section 65 – Training agreements

Regulations

Board regulation establishing apprenticeship programs (pending)

Policies

Ontario College of Trades policy for setting academic entry requirement (pending)

Forms

012-1661 Application for Apprenticeship Training

4.0 Policy

4.1 The ministry will determine whether applicants for an apprenticeship program established by the Ontario College of Trades meet the academic entry requirements set out by the Registrar of the Ontario College of Trades.

4.1.1 Placeholder for the Ontario College of Trades trade-specific academic entry requirements

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http://cscportal.edu.gov.on.ca/sites/ORUportal/Pages/apprenticeship/OOR/oor_apprentices.aspx?source=thanks.aspx

4.1.2 The ministry will accept apprentices registered in other Canadian jurisdictions without confirming that they meet the Ontario academic requirement for their trade if they provide proof that they have a valid registration in the other jurisdiction at the time they wish to register in Ontario as an apprentice.

4.2 Equivalency to Grade 12 for the Purpose of Apprenticeship Registration

4.2.1 For the purpose of entrance into an apprenticeship program where the academic entry requirement is Grade 12 (OSSD) or its equivalent, the following are considered equivalent to an Ontario Secondary School Diploma:

- (a) A secondary school graduation diploma from any other Canadian province or territory or from issued by a state or territory of the United States. Note: The equivalent to the OSSD in Quebec is the Secondaire V graduation diploma. The diploma from Quebec's high school "trades" program, although a graduation diploma, is not the equivalent of an OSSD.
- (b) A Canadian General Education Development (GED) certificate issued by a Canadian province or territory or issued by a state or territory of the United States.
- (c) A non-Canadian GED certificate determined by the Independent Learning Centre (ILC) to be equivalent to the Ontario GED.
- (d) A transcript, diploma or certificate from another country, assessed at an Ontario OSSD level by a recognized assessment service.
- (e) A Canadian postsecondary diploma or degree.
- (f) A non-Canadian postsecondary diploma or degree that has been assessed as equivalent to a Canadian postsecondary diploma or degree by a recognized assessment service.
- (g) An Academic and Career Entrance/Accès carrières études (ACE) Certificate issued by an Ontario college of applied arts & technology

Ministry of Advanced
Education and Skills
Development

Ministère de l'Enseignement
supérieur et de la Formation
professionnelle

Employment and Training
Division

Division de l'emploi et de la
formation



PROOF OF EDUCATION

Acceptable documentation for proof of education (Please attach photocopy of only one of the following):

- Secondary School diploma
- Academic transcript
- Post-Secondary diploma (diplomas or certificates from private career colleges are **not** acceptable)
- Post-Secondary degree
- General Education Development (GED) certificate
- Transcript, diploma, certificate or degree from another country outside of Canada and the United States, assessed by a recognized assessment service
- Level IV Ontario Basic Skills
- Academic and Career Entrance (ACE) certificate
- Certificate of completion of a Ministry Advanced Education and Skills Development approved trade-specific training program from an Ontario College of Applied Arts and Technology
- Certificate of Apprenticeship or Certificate of Qualification in any trade from Ontario or other Canadian jurisdiction
- Certificate of completion of an academic upgrading program that is accepted by an Ontario College of Applied Arts & Technology for entry into an Ontario postsecondary program

PROOF OF SOCIAL INSURANCE NUMBER

Acceptable documentation for social insurance number (Please attach photocopy of only one of the following):

- SIN card
- Government issued document verifying SIN number

PROOF OF AGE

Acceptable documentation for proof of age (Please attach photocopy of only one of the following):

- Driver's license (including graduated license)
- Passport (valid or expired)
- Birth certificate
- New Ontario ID card
- Nexus card
- Recent photo accompanied by a letter from a notary public or lawyer confirming date of photo
- Baptismal certificate

Acceptable documentation of proof of age if accompanied by a photo:

- Certificate of Canadian citizenship or naturalization
- Certificate of Indian or Métis status issued by the federal government
- Current identity document issued by a government ministry or agency with a vigorous registration and security clearance process (e.g., OPP or RCMP security check)
- Canadian firearms registration licence

Please note: Do not submit original documents. To ensure the security of your personal information, you may wish to send copies of your documents through password protected email, registered mail or in person.