

EASTERN SCHOOL DISTRICT

Course Descriptor Summary

(Interim September 2005)

SUBJECT AREA: Technology Education

COURSE: Communications Technology 2104

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1. GENERAL OVERVIEW

This course is a 60-hour/1-credit (typically one semester) course. Students are expected to develop an understanding of the basic communications principles and of the communication s model of message sender, channel, receiver. They will develop technical skill and apply technological problem solving strategies to communications projects in audio, graphics, animation, basic electronics and computer networks. The course consists of seven (7) units, including 17 learner outcomes, and activities are designed for each outcome.

Core Units	Weight	Hours
Unit 1. Introduction	6%	4
Unit 2. Electronics	18%	11
Unit 3. Networks	15%	9
Unit 4. Audio	15%	9
Unit 5. Basic Graphics	15%	9
Unit 6. Animation	15%	9
Unit 7. Marine Communications	15%	9
TOTALS	100%	60

Units 1 and 2 are to be taught to the whole class in a classroom setting. The remaining Units are designed as multi-activity modules, in groups of 2 to 3 students, in a facility which ideally includes a computer laboratory with an adjacent workshop.

2. PARTICIPANTS - RECOMMENDED:

This course is designed to provide a broad perspective of the use of Information and Communications Technologies (ICT) . Although Technology Education courses are no longer required curriculum in NL high schools, knowledge of this area is a highly desirable asset for students graduating into the work force or post-secondary education and training. Familiarity with then use and capabilities of technology is now widely considered as the third essential asset for every student, along with literacy and mathematics. Furthermore students flock to these courses as they are interesting, challenging, hands-on, activity-based and offer outlets for creativity and teamwork.

3. COURSE OBJECTIVES:

The objectives of this course are that the student will:

- develop an understanding of the technological and scientific principles, applies in current and emerging communications methods;
- have the opportunity for practical application through 'hands-on' activities with current and emerging communications methods, devices and systems;
- understand career opportunities and work requirements related to communications technologies to enable them to bridge the gap between school and workplace;
- develop safe, efficient and well planned work procedures in the practical use of equipment and materials;
- develop effective strategies for team-based technological problem solving;
- comprehend the historical development and impact of modern technological systems on our individual and collective lives;
- develop an understanding of basics electronics principles in communications technologies;
- make informed decisions when selecting electronics communications equipment;
- have the opportunity to explore interact and become confident with current communications technologies for networking, audio, graphics, and computer-based animation;
- develop knowledge and problem solving ability with respect to the design of elementary communications systems;
- comprehend modern marine communication systems as an example of industrial communications processes.

4. COURSE CONTENT - CORE UNITS:

UNIT 1. Introduction to ICT

Unit 1 includes an appreciation of the historical development of communications technologies, identifying and explaining the applications and importance of ICT in today's world; and apply their knowledge of the communications module in a simple problem-solving project.

UNIT 2. Electronics of Communications Systems

Unit 2 includes an introduction to basic electrical and electronics concepts such as circuits; current; resistance; voltage; AC/CD circuit components; basic electronics components. The

applied phase of this unit involves identification of the values and specifications of various electronic components; performing tests on these components and assembling / testing a simple electronics communications project.

UNIT 3. Communications Networks

This unit investigates various network systems, including LANs, WANs, OS, Network applications and services, IP, ICP-IP, network topologies and equipment. Higher order performance involves the design of a small office computer network. The applied phase of this unit requires students to use network applications and higher order performance requires configuring and operating a Bulletin Board System (BBS).

UNIT 4. Audio Systems Technology

Sound encoding/decoding in analog and digital formats are covered. The principles of radio wave transmission and receiving are discussed. Students will apply these principles in assembling an audio device such as a crystal radio or upgrading the quality of an audio device by amplification. Students will also use audio systems for recording, editing and playing audio materials in an instructional product focuses on an audio device or other technology device.

UNIT 5. Basic Graphic Communication

Unit 5 includes the use of pictures and text in publications and posters, advertising, brochures, etc. Three major tools are used in this communication form: word processors, imaging scanning, editing, or production mechanisms and software, and full-fledged desktop publishing tools which include dedicated computers and software for graphic and print production. Students will develop a knowledge of basic graphic design and communications system components, software and output devices. Students will compare the impact of various graphic communications media or project the future of this medium. Students will also apply basic graphics production techniques in modifying or creating a one-page and a multi-page document, such as a brochure, newsletter or menu.

UNIT 6. Animation:

Animation holds immense potential for entertainment as well as instruction and education. It is not a new technology as evidenced by older Disney films, however, computer graphics have dramatically enhanced the efficiency and reality of animated graphics. Students will explore cel animation, morphing and colour cycling techniques. Students will follow the production process for animation through storyline, storyboard, and animation using simple software.

UNIT 7. Marine Communications Technology

The breadth of Marine Communications technology is vast and includes navigation, vessel traffic management (VTM), surveillance, data sampling and reporting, and communications. The student will demonstrate a familiarity with these technologies through lectures , research

and reporting on them in one of the media used in the course. Higher order performance will involve producing a research project report on the use and implications of remote sensing technologies in monitoring ice floes, icebergs, waves, currents, water temperature or ships. The students will also identify a marine issue or problem and it's solution using communications technologies.

5. EVALUATION:

This course has curriculum outcomes within which are three levels of difficulty. Student performance can be evaluated through the level to which the specific curriculum outcomes are achieved.

Three levels of performance are specified for each of these 17 specific curriculum outcomes:

- the higher level is required in three (3) 20% of the curriculum outcomes;
- the medium level for at least ten (10) 60% of these curriculum outcome
- the lower level of performance is permissible in the remainder of the outcomes.

The criteria for evaluation of student achievement in activity-based technology courses include:

- initiative (independent work and engagement)
- engagement (time on task – the amount of supervision required to maintain this)
- teamwork skills (cooperative work with others in a group activity)
- product (solution of the problem or stages in the progression of the problem)

Evidence of student achievement can be measured by a range of tasks, from such sources as:

- observations
- check lists or rating scales
- interviews
- self evaluation or peer evaluation in the group
- projects
- presentations
- work samples
- portfolios
- journals
- written tests
- research
- peer evaluation

Performance evaluation in the course should reflect the following relative weights.

Categories	Weighting
Knowledge of content / concepts	20%
Problem-solving skills	25%
Research Skills	20%
Production (product)	25%
Knowledge about careers	10%

6. INSTRUCTIONAL STRATEGIES

This course should focus on the development of higher learning skills. Students should develop the ability to reason, to make realistic judgments and develop creative solutions to problems. Students should use decision-making strategies to achieve these solutions and employ the design process for technical problem solving

Recommended teaching / learning strategies include:

- adapting the course to the pace of learning of which the student is capable;
- cooperative learning in small groups in which group success translates into individual success;
- consideration of different learning styles;
- lectures, discussions and group / individual coaching.

7. CLASSROOM ENVIRONMENT

The basic logistic requirements for teaching this course include:

- Desks or tables with adequate space to place manuals or interface equipment (3-4 linear feet/workstation)
- Computers on the basis of 1 / student pair at a minimum, or ideally 1 per student.
- Full access to Stem-Net via the
- The computers should have 16mB RAM, 500 mB hard drives, with fast clock as required for the graphics-based activities.
- Ideally, two of these units should have 17" monitors or larger and used for graphics and animation units.
- Other desirable peripherals include a plotter, a scanner and a colour inkjet printer.

Comprehensive curriculum guide and instructional materials available on the Department of Education's website: <http://www.ed.gov.nl.ca/edu/sp/techedu.htm>