

TEJ20 COURSE: COMPUTER TECHNOLOGY

COURSE OUTLINE – COMPUTER TECHNOLOGY, GRADE 10, OPEN (TEJ20)

SCHOOL :	R. H. KING ACADEMY	
DEPARTMENT:	TECHNOLOGICAL STUDIES	
CURRICULUM LEADER:	Dimos Raptou	
TEACHER:	J. RYU (OFFICE - RM. A31)	
COURSE TITLE:	Computer Technology	
COURSE TYPE:	Open	
GRADE :	10	PREREQUISITE: None
COURSE CODE:	TEJ20	CREDIT VALUE: One
COURSE FEE:	NONE	

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COURSE DEVELOPED: September 2011

RESOURCES:

1. **Curriculum Web**
site: <http://www.edu.gov.on.ca/eng/curriculum/secondary/teched910curr09.pdf>
2. **Textbook:** Beth Brown, Bruce Presley. *An Introduction to Programming Using Microsoft Visual Basic.Net*, Lawrenceville Press, 2003. ISBN 1-58003-038-6.
3. **Computer Lab A22: Visual Studio. VB.Net Programming Environment**
4. **Student Binder** (15 dividers plus cover page) containing all handouts and assignments.
5. **Course Folder in the TDSB File Server.**

A. COURSE OUTLINE

This course examines computer hardware and the control of external components from an engineering perspective. The course introduces students to computer systems, networking, and interfacing, as well as electronics and robotics. Students will assemble, repair, and configure computers with various types of operating systems and application software. Students will build small electronic circuits and write computer programs to control simple peripheral devices or robots. Students will also develop an awareness of related environmental and societal issues, and will learn about secondary and postsecondary pathways and career opportunities in computer technology. This course is designated as open and can be taken by all students who wish to learn about Computer Technology. Students who wish to continue study in this area can take the Workplace or University/College courses in Grades 11 and 12 that lead to post-secondary courses or entry into

the workplace. For this course also each student has to have a binder with dividers for each module. The binder has to contain all the lessons, notes, handouts, assignments, tests and quizzes, and it will be marked twice: midterm and at the end of the course. Some modules in this profile involve hands-on work with live electronic devices. Therefore, a focus on safe technical practices is required in this course. Safe operating procedures should be reviewed on a continuous basis.

Overall Expectations

By the end of this course, students will:

- identify and describe the functions of, as well as important advances related to, electronic and computer components;
- demonstrate a basic understanding of computer networks and their components;
- demonstrate a basic understanding of binary numbers and digital logic.
- install and configure the hardware and operating system of a workstation, and use file-management techniques effectively;
- construct and test simple interfaces and other electronic circuits;
- assemble and configure a simple computer network;
- install and use a variety of software;
- apply fundamental programming concepts to develop a variety of simple programs, including a program to control an external device.
- identify harmful effects of the widespread use of computers and associated technologies on the environment, as well as agencies that reduce these effects;
- identify effects of the widespread use of computers and associated technologies on society;
- follow appropriate health and safety procedures when assembling, using, and maintaining computer systems;
- demonstrate an understanding of ethical and security issues related to the use of computers;
- identify various careers related to computer technology, and describe the education and/or training required for them.

Topics to be covered

Ergonomics. Health and Safety. Ethics and Security

Data Representation and Digital Logic. Binary Numbers. Digital Logic circuits. Logic Gates and Truth Tables

PC Hardware and Interfaces

Operating Systems and Applications Software

Networking Concepts. Networking Set Up and Management

Computer Programming with VB.Net

Programming Concepts: Variable and Constants, Decision Structures, Repetition Structure

Electronics, Robotics and Computer Interfaces

Computer Technology, Environment and Society: Social Impact and Consequences

Computer Career Opportunities

Module Titles (Sequence and Time)

MODULE	UNITS/LESSONS DESCRIPTION	HOURS
ERGONOMICS. HEALTH AND SAFETY. ETHICS AND SECURITY	Students explore ergonomics, health and safety problems associated with computer use. Safe practices in the handling of computer hardware and electronic components. Use appropriate equipment, procedures, and techniques (<i>e.g., use a wrist support, ensure power is off before opening the case of a computer, use proper lifting techniques when moving heavy equipment</i>) to protect health and ensure safety when working with computers (<i>e.g., to avoid musculoskeletal injuries, eye strain, repetitive strain injuries</i>); identify issues related to Internet safety and personal identity security (<i>e.g., protection of information stored on computers or transmitted over a network, identity theft, cyber stalking, cyber bullying, privacy policies</i>); ethical use of computer (<i>e.g., the social cost of hacking, lost and corrupt data, and plagiarism</i>);	4 hours
COMPUTER TECHNOLOGY: SOCIAL AND ENVIRONMENTAL IMPACT AND CONSEQUENCES	Students will identify: 1. harmful effects of computer use on the environment (<i>e.g., resources used and wastes created during production; disposal of old computers in landfill</i>); 2. government agencies and community partners that provide resources and guidance for environmentally sound production, use, and recycling of computer equipment; 3. the social and ethical implications of computers; 4. the effects of the development of computer technology on society (<i>e.g., cheaper and faster communication in a “global village”; almost instant access to information; changes in the nature of work; telecommuting; easily accessible means of recording and maintaining knowledge and traditions of minority cultures</i>). 5. Students will describe how computers are used in various occupations (<i>e.g., engineering calculations, architectural drawings, customer tracking and business data collection, navigation of airplanes and ships</i>), and what work in these occupations would be like without computers.	6 hours
BINARY NUMBERS	The focus of this module is on how the internal workings of a computer represent data such as characters and numbers. Students learn standard codes for internal numbering and character representation (<i>e.g., binary counting, binary codes, ASCII code, UNICODE</i>). 1. How information is represented in computers; 2. Base Number Systems. Binary Number System. Binary place values; 3. Converting Binary to Base 10 and Base 16; 4. Converting Numbers from the Decimal System to Another Base Number System; 5. Adding Binary Numbers; 6. Adding Base Number Systems other than 10.	5 hours
LOGIC GATES AND TRUTH TABLES DIGITAL LOGIC CIRCUITS	In this module students learn to design and test fundamental logic gates (i.e., AND, OR, NOR, NAND, NOT, XOR, XNOR). They also learn about and construct simple electronic circuits, apply Boolean algebra, and devise truth tables to test and describe their functionality. Students develop an understanding of gates, semi-conductors (e.g., transistors, diodes, etc.), and integrated circuits by designing and building simple logic gates. 1. Parallel and Series Circuits; 2. Truth Tables; 3. Fundamental Logic Gates: AND, NAND, OR, NOR, XOR, XNOR, and NOT; 4. Boolean Equations for Fundamental Logic Gates (<i>e.g., for AND, the output is $Y = A \cdot B$; for OR, $Y = A + B$</i>); 5. Design Logic Gates and Integrated Circuits with E-Work Bench.	5 hours
PC HARDWARE AND	In this module, students will: 1. identify basic electronic components and describe their functions (<i>e.g., resistors limit current; capacitors store charge, pass high frequencies, and block DC; diodes restrict current</i>	20 hours

<p>INTERFACES. WORKSTATION SETUP</p>	<p><i>in one direction; LEDs indicate current flow; transistors act as amplifiers or switches</i>); 2. use precise terminology to identify various types and features of computer hardware and interfaces (<i>e.g., device name, capacity, speed, bandwidth, connector types</i>); 3. identify the basic components and peripheral devices of a computer system (<i>e.g., mainboard, CPU, power supply, hard drive, monitor, mouse, sound card, printer, scanner</i>), and describe their functions; 4. describe important advances in electronic components (<i>e.g., development of semiconductor technology</i>) and computer components (<i>e.g., clock rates, fabrication techniques, bus types</i>). Emphasis is placed on safety as students handle a variety of tools, equipment, and internal and external components. 1. Computer Architecture. 2. PC Components. 3. Input Devices. 4. Output Devices. 5. Communication Devices. 6. Motherboard, Slots and PC Cards. 7. CPU. 8. Primary Storage. RAM and ROM. 9. Secondary Storage Devices. How Disk Storage Works. How a USB Drive and Hard Disk Drive Work. 10. Storage Devices and RAID. 11. Ports and Connectors. How Computer Ports Work. 12. POST (Power-On-Self-Test). 13. BIOS and CMOS. 14. Multimedia. How CD-ROM Works. 15. Bus Architecture. How a Bus Works. Also students will learn how to: connect and configure the hardware for a personal computer system, and install an operating system; describe the hardware requirements of operating systems (<i>e.g., processor speed and bus width, available storage space, memory size and speed</i>); use file-management techniques to organize and back up files efficiently (<i>e.g., move and rename files, store files on a network drive, use file-management and backup software</i>).</p>	
<p>PC SOFTWARE. OPERATING SYSTEMS AND APPLICATIONS SOFTWARE</p>	<p>Students will: 1. describe the differences between operating systems and applications software; 2. install and configure software on a workstation (<i>e.g., word-processing suite, driver for new hardware</i>); 3. use software support systems to find technical information independently (<i>e.g., help menu, online help, manuals</i>); 4. use utility software to perform basic maintenance functions (<i>e.g., defragment a disk drive, undelete a file, determine available space on a storage device, restore a file from a backup</i>). Operating system components, interface and structure; how an Operating System controls hardware.</p>	<p>3 hours</p>
<p>NETWORKING CONCEPTS. NETWORK SETUP AND MANAGEMENT</p>	<p>Students will: 1. describe the basic components of a network (<i>e.g., workstations, server, network interface cards, routers, switches, hubs</i>); 2. compare various types of networks (<i>e.g., local area network [LAN] versus wide area network [WAN], peer-to-peer versus client-server</i>); 3. compare the various types of data transmission media for networks (<i>e.g., fibre-optic cable, copper cable, wireless</i>); 4. describe how individual workstations are identified on a network (<i>e.g., logical and physical addressing, verification utilities</i>). 5. install and configure a peer-to-peer (P2P) network, using appropriate software and connection devices; 6. enable network services (<i>e.g., file sharing, print services</i>). 7. Network Topologies: Mesh, Bus Star, Ring. 8. OSI Reference Model. 9. Networking Protocols. 10. IP Addresses and their Format. 9. TCP/IP Protocol.</p>	<p>6 hours</p>
<p>COMPUTER CAREERS</p>	<p>Students research and identify computer technology related careers. Students identify employability skills and explore careers in the computer industry. 1. Computer and IT related jobs. 2. Job Description. Nature of the work. 3. Skills set. 4. Training path. Qualification requirements. 5. Main Industries of Employment. 6. Related occupations. 7. Transferable Skills. 8. Trends and Outlooks. 9. Annual Average Income. 10. Resources.</p>	<p>8 hours of work 10 hours for presentations</p>
<p>COMPUTER</p>	<p>This module introduces Visual Basic Programming language</p>	<p>6 hours</p>

PROGRAMMING. PROGRAMMING CONCEPTS: VISUAL BASIC IDE	and Integrated Development Environment (IDE) 1. Visual Basic Programming Language. 2. A Visual Basic Application. 3. The Visual Basic IDE. 4. Adding Objects to a Form. 5. Object Property Values. 6. Resizing and Moving an Object. 7. Saving a Project. 8. Running a Visual Basic Application. 9. Objects and their Event Procedures. 10. Using Assignment to Change Property Values. 11. The Form_Load Event Procedure. 12. Commenting Code. 13. Operators and Expressions. 14. Creating an Executable File.	
PROGRAMMING CONCEPTS: VARIABLES AND CONSTANTS	This module focuses on basic programming concepts: programming structures, variable declarations, assignment statements, input/output. 1. Using Variable . 2. Variable Assignment. 3. Using Name Constants. 4. Choosing Identifiers. 5. Built-In Data Types. 6. Variable Declarations. 7. Syntax Errors. 8. Debugging Techniques. 9. Obtaining a Value from the User. 10. Automatic Type Conversion. 11. Special Division Operators. 12. Option Buttons. 13. Visual Basic Programming Guidelines.	7 hours
PROGRAMMING CONCEPTS: DECISION STRUCTURES	This module introduces If statements as decision/selection structure. Each structure builds upon and is incorporated into subsequent structures. 1. The If... Then Statement. 2. Roundoff Error. 3. The If...Then...Else Statement. 4. Nested If...Then...Else Statements. 5. Generating Random Numbers. 6. Scope. 7. Logical Operators. 8. Algorithms. 9. Message Boxes. 10. Creating a Password Application. 11. Using Counters. 12. Check boxes. 13. Printing a form.	7 hours
PROGRAMMING CONCEPTS: LOOPS AND FUNCTIONS	This module focuses on repetition or iteration programming structure. Do...Loop Statement . The programming software that will be introduced in this module allows students to write simple programs which integrates with hardware to control external devices and peripherals. 2. Infinite Loops. 3. Input boxes. 4. Using Accumulators. 5. Character data Storage. 6. Comparing Strings.	7 hours
ELECTRONICS, ROBOTICS AND COMPUTER INTERFACES	Students will use appropriate test equipment to measure electrical quantities (<i>e.g., voltage, resistance</i>). They will design and test electronic circuits (<i>e.g., LED circuit, flasher, timer</i>), using both breadboard and soldering techniques to connect discrete components and/or integrated circuits. Describe and build an interface to connect a computer to a simple peripheral or robotic device (<i>e.g., LED traffic light, DC motor, robotic arm</i>). Trace the operation of a system consisting of a computer, a program, an interface, and external hardware to ensure that the interface circuit functions properly.	6 hours
EXAM REVIEW	Ten to 15 minutes per module.	4 hours plus Home work
FINAL EVALUATION/EXAM	Theoretical (online version available) and practical.	2 hours

Teaching/Learning Strategies

IIA units are activity-based. Socratic lessons, teacher demonstrations, and research activities provide students with the necessary terminology and methodology necessary to complete the various activities. Classroom discussions, brainstorming, and collaborative and/or co-operative learning is used to assist students in meeting course expectations. Problem-solving exercises are used. Students also research, write reports, and take notes in meeting expectations. Upon completion of this course, students demonstrate the ability to apply skills and knowledge to practical work tasks that involve planning and implementation processes, completion of work assignments, and various problem-solving activities.

B. OVERVIEW OF EVALUATION AND WEIGHTING

Students are provided with opportunities to demonstrate the highest level of their achievement of the expectations in the four achievement categories. Students will be evaluated based on the following four categories of knowledge and skills in technological education (70% of the final mark) and a final exam (30% of final mark).

Students will be graded based on the following categories:

Knowledge/Understanding	20%
Thinking and Inquiry	20%
Application	20%
Communication	10%
Culminating Activity	10%
Final Exam	20%

COURSE EVALUATION PLAN**70% Course Work**

(K/U = Knowledge/Understanding; TI = Thinking and Inquiry; A = Application; C= Communication)

CHAPTER/UNIT	EVALUATION TASK	ACHIEVEMENT CHART FOCUS	WEEK ENDING	DUE DATE
ERGONOMICS. HEALTH AND SAFETY. ETHICS AND SECURITY	Assignment: Design your Ergonomic Office. Quiz	K/U, TI, C, A	WEEK 2	
COMPUTER TECHNOLOGY: SOCIAL AND ENVIRONMENTAL IMPACT AND CONSEQUENCES	Assignment: Essay/Report. Social Impact of IT.	K/U, TI, C	WEEK 3	
BINARY NUMBERS	Test: Binary Numbers	K/U, TI, A	WEEK 4	
DIGITAL LOGIC CIRCUITS. LOGIC GATES AND TRUTH TABLES	Test: Logic Gates and Truth Tables	K/U, TI, A	WEEK 5	
PC HARDWARE AND SOFTWARE. WORKSTATION SETUP	Assignment: Design your Computer Dream. Major Assignment: Computer Components. Test PC Hardware and Software. Practical Assignment: Build your own computer.	K/U, TI, A, C	WEEK 6, 7 and 8	
PC SOFTWARE. OPERATING SYSTEMS AND APPLICATIONS SOFTWARE	Practical assignment.	K/U, A	WEEK 9	

NETWORKING CONCEPTS. NETWORK SETUP AND MANAGEMENT	Class Assignment: Network Topologies. Test: Networking	K/U, TI, A	WEEK 9	
COMPUTER CAREERS	Major Assignment: Computer Careers.	K/U, C	WEEK 10	
FOUNDATION OF PROGRAMMING. PROGRAMMING CONCEPTS: VISUAL BASIC IDE	Chapter 3 Test. Chapter 3 Exercises and Reviews	K/U, TI, A	WEEK 11	
PROGRAMMING CONCEPTS: VARIABLES AND CONSTANTS	Chapter 4 Test. Chapter 4 Exercises and Reviews	K/U, TI, A	WEEK 12	
PROGRAMMING CONCEPTS: DECISION STRUCTURES	Chapter 5 Test. Chapter 5 Exercises and Reviews	K/U, TI, A	WEEK 13	
PROGRAMMING CONCEPTS: LOOPS AND FUNCTIONS	Chapter 6 Test. Chapter 6 Exercises and Reviews	K/U, TI, A	WEEK 14 and 15	
ELECTRONICS, ROBOTICS AND COMPUTER INTERFACES	Assignment: build and test a circuit	TI, A	WEEK 16	
BINDER EVALUATION	Learning Skills	K/U, TI, C, A	WEEK 17	
EXAM REVIEW		K/U, TI, C, A	WEEK 18	
Culminating Exam	Final Exam	K/U, TI, A, C	WEEK 19	
EXAM	Final Exam	K/U, TI, A, C	WEEK 19	

30% Final Evaluations

Task	Achievement Chart Focus	Weighting
Culminating Assignment	All categories: K/U, TI, C, A	10%
Examination	All categories: K/U, TI, C, A	20%

Learning Skills

Student Learning Skills will also be monitored and evaluated throughout the year. The report card provides a record of the learning skills demonstrated by the student in the following five categories: **Works Independently, Teamwork, Organization, Work Habits and Initiative**. These learning skills are evaluated using the following four point scale: (E) Excellent, (G) Good, (S) Satisfactory, (N) Needs Improvement.

	<i>Needs Improvement</i>	<i>Satisfactory</i>	<i>Good</i>	<i>Excellent</i>
Works Independently	<ul style="list-style-type: none"> • Uses limited and inefficient learning strategies. • Rarely meets deadlines and expectations. • Rarely focused and determined 	<ul style="list-style-type: none"> • Uses several acceptable learning strategies. • Sometimes meets deadlines and expectations. • Focused, but often needs reminders to stay on task. 	<ul style="list-style-type: none"> • Uses a variety of efficient learning strategies. • Usually meets deadlines and expectations • Focused, but occasionally needs reminders to stay on task. 	<ul style="list-style-type: none"> • Uses a wide variety of high efficiency learning strategies. • Always or almost always meets deadlines and expectations. • Focused, and rarely needs reminders to stay on task.
Teamwork	<ul style="list-style-type: none"> • Shows reluctance to take on an alternate role in a group. • Rarely shares ideas and views. • Rarely listens passively or actively. 	<ul style="list-style-type: none"> • Generally works in the same role in a group; occasionally tries an alternate role. • Sometimes shares ideas and views. • Listens passively and actively some of the time. 	<ul style="list-style-type: none"> • Frequently tries alternate roles in a group. • Usually shares ideas and views. • Listens passively and actively most of the time. 	<ul style="list-style-type: none"> • Takes on a variety of roles in a group. • Always or almost always shares ideas and views. • Listens passively and actively almost all of the time.
Organization	<ul style="list-style-type: none"> • Rarely brings required materials to class. No binder or missing handouts • Limited organization. • Rarely uses resources. 	<ul style="list-style-type: none"> • Generally brings required materials to class. Binder disorganized • Partial organization. • Sometimes uses resources. 	<ul style="list-style-type: none"> • Usually brings required materials to class. Binder with dividers and handouts. • Considerable organization. • Usually uses resources. 	<ul style="list-style-type: none"> • Always or almost always brings required material to class. . Binder well organized including all materials. • Effective organization. • Always or almost always uses resources.
Work Habits	<ul style="list-style-type: none"> • Completes little, if any, homework. • Rarely submits work on time. • Rarely makes up missed work. <p>Low consistency in overall learning</p>	<ul style="list-style-type: none"> • Completes more than half of homework. • Generally submits work on time. • Sometimes makes up missed work. <p>Satisfactory consistency in overall learning</p>	<ul style="list-style-type: none"> • Completes most homework. • Usually submits work on time. • Usually makes up missed work. <p>Good consistency in overall learning</p>	<ul style="list-style-type: none"> • Completes all homework. • Always or almost always submits work on time. • Always or almost always makes up missed work. <p>High consistency in overall learning</p>
Initiative	<ul style="list-style-type: none"> • Rarely acts to solve problems. • Rarely recognizes what needs to be done and rarely takes appropriate steps. 	<ul style="list-style-type: none"> • Sometimes acts to solve problems. • Sometimes recognizes what needs to be done and does it. 	<ul style="list-style-type: none"> • Usually acts to solve problems. • Usually recognizes what needs to be done and does it. 	<ul style="list-style-type: none"> • Always or almost always acts to solve problems. • Always or almost always recognizes what needs to be done and does it.

Diagnostic evaluation - at the beginning of a term, a unit of study, or whenever information about prior learning is useful: unit pre-tests, skill inventory.

Formative evaluation - during learning, ongoing feedback to students of their strengths, weaknesses, and achievement of the expectations: course binder, course folder structure and updates, e-portfolio, self-assessment rubrics, checklists for programming problems, student/teacher conferencing, observation, peer assessment rubrics, check lists, anecdotal comments with suggestions for improvement, quizzes, self-assessment, journals, learning logs, reflection – important tools to encourage students to be more involved in their own learning process.

Summative evaluation - at the end of a learning process: classroom presentations, paper and pencil quizzes, tests, unit tests, final exam, assignments and projects evaluated using rubrics, culminating challenges, on line tests, quizzes and exam, rubrics, skills demonstration – hardware and networking skill demonstration, computer programs – focusing on both process and the final product, research projects. Student achievement is based on how well Ministry Expectations are met.

Tests/Quizzes

Tests will fall under the knowledge/understanding and thinking/inquiry achievement categories. Tests may be either theoretical or practical (performed on the computer) or a combination of both. Students will be informed well in advance of any test. Tests/Quizzes will be given on a regular basis. Students will be notified about quizzes at least one day in advance. At the end of each unit a test will be given. Students will be notified about unit tests a week in advance. Performance on tests and quizzes will be used to assess the achievement of knowledge and skills. If a test is missed due to illness a doctor's note must be presented. **Students who are going to miss a test because of a school trip or team activity must notify their teacher two days prior to the test date, so that an earlier test date may be assigned for those students.** These are the only valid reasons for a rewrite. **Failure to write a test will result in a NOT COMPLETE.** A student may only make up one test during the semester. Any other missed test will result in a **NOT COMPLETE**.

Missed Tests/Quizzes

If a student knows they will be absent on the day of a test, they must notify the teacher in advance. Arrangements will be made for the student to write the test at an alternate time if an acceptable reason is given.

Illness	A doctor's note must be produced
Excursion	Excursion form signed by student's teachers
Other	Appropriate documents

Assignments

Assignments will be given for each unit. Performance on assignments will be used to assess the achievement of knowledge and skills.

Late Assignments

Assignments are due at the beginning of the class on the due date, all assignments handed in past the ultimate due date (the last date the assignment will be accepted) will no longer be accepted. The students must give an acceptable reason to the teacher for handing in an assignment late prior to the due date. If an assignment is handed in later than course expectations deadline, the assignment will be marked as **Not Complete**.

If the teacher hands back an assignment to students, after being marked, late assignments will no longer be accepted after unit expectations deadline expired. In this case, the assignment will be marked as **Not Complete**.

Independent Study

There will be at least one independent study assigned. The independent study will be based on any of the units outlined for this course. Students are responsible for any material covered by independent study. Thus, tests may cover some of the material from the independent study.

All independent studies must be handed in on time otherwise a NOT COMPLETE will be given.

Remember: You always have CLINIC TIME to work on any computer assignments if you fall behind.

Midterm Mark

There will be no midterm examination. The midterm mark is based on the student's cumulative mark at the midterm mark date.

Binder Mark

Each student has to keep all lessons, notes, handouts, assignments, etc. well organized in a separate binder with dividers for units and modules. the binder will be marked at least twice: mid term mark and final mark. The mark will be based on how well organized is the binder, completeness of content and assignments.

Participation mark

At the end of semester each student will get a participation mark based on the number of absences and lates, class participation, course and class discipline, general attitude towards the course values, equipment and teaching and learning process.

The Final Summative Evaluation/Exam

The content of the final summative evaluation/exam will be based on the material covered throughout the full semester. For further information on final summative evaluation/exam protocol refer to the student agenda book.

C. ACCOMMODATIONS

The following teaching and learning strategies are used in the module and units: hardware devices (e.g., large screen monitors, larger fonts, special keyboards); appropriate environmental accommodations for students with physical disabilities; conferencing with Special Education staff and students to discuss modification and accommodation and to ensure physical aspects of the environment meet the needs of students and the program; word lists, glossaries, definition of terms, and visuals if available; grouping weaker students with stronger students to assist in instructional remediation and to provide further challenge; allowing more time to organize and complete assignments; providing a choice of assignment formats where possible; selecting problems that involve programming topics familiar to students to ensure better understanding of requirements; providing additional materials to reinforce or extend learning; providing opportunities for students requiring enhancement of program; using visual and audio-visual and web aids: digital projector, course web site; adjusting expectations for written work and number of assignments required.

Assessment Accommodations: providing additional review for students having difficulty integrating all the structures; allowing for non-timed evaluations; ensuring students understand; assessment/evaluation tools; providing the option for oral testing and demonstrations of skills.

Instructional Accommodations: peer tutoring, flexible timelines, small group learning, encouraging student-to-student discussion and teacher-to-student discussion to encourage confidence and motivation; written materials for students having difficulty processing auditory information, handouts to reinforce demonstrations, supplementary print and/or audiovisual aids to support activities.

D. R. H. KING ACADEMY STUDENT EXPECTATIONS

1. Students must adhere to the computer use policy as outlined in the Code of Conduct
2. Students must bring all class materials including any disks they need to every class.
3. When students work in pairs they must still maintain their own copy and back up of all assignments. Submitted assignments will have both student names. One may only work with a partner if approved by the course teacher. Under no other circumstances will assignments be identical.
4. Every student is responsible for missed work due to absence. It is suggested the student have the phone numbers of, at least, two fellow classmates.
5. Attendance is obligatory in order to fulfill course requirements.

E. RESOURCE BOOKS

Smyth, Graham. *Computer Engineering: An Activity-Base Approach*. Holt software Associates Inc. Toronto, 2000. ISBN 0-921598-36-X

Norton, Peter. *Essential Concepts*. McGraw-Hill Ryerson Limited, 1999. ISBN 0-02-804394-4

Rood, H.J. *Logic and Structured Design for Computer Programmers*, Second Edition. Boston: PWS-KENT Publishing Company, 1992. (Chpt. 1.2, 2) ISBN 0-534-92966-4

Tapscott, Don. *Growing up Digital*. McGraw Hill Ryerson Limited, 1998. ISBN 0-07-063361-4

White, Ron. *How Computers Work*. Quebec, Canada: 1997. ISBN 01-56-276546-9

<http://openbookproject.net/electricCircuits/>