Correlation of the textbook *Introduction to Programming in Java* to the Ontario Computer Information and Science Curriculum Policy Document for Grade 12 ICS 4M

Expectation Code	**Learning Expectation**	**Textbook Page Number**
Theory and Foundation		
Overall Expectations		
TFV.01	describe the steps in the software life cycle (problem definition, analysis, design, implementation, testing, and maintenance);	60 - 66
TFV.02	explain data structures and their processing algorithms;	107 - 116
TFV.03	analyse a number of programming paradigms;	66 - 75
TFV.04	explain the importance of program correctness and efficiency;	61 - 63
TFV.05	describe the relationship among hardware, software, and network requirements.	14 – 28
Specific Expectations		
Problem Solving, Logic, and Design		
TF1.01	describe the components of the software life cycle and their importance in project settings;	560, 60-66 Appendix A
TF1.02	explain the importance of designing reusable code for large software projects;	13, 67, 71
TF1.03	identify similarities and differences among data structures, including arrays, records, and arrays of records, and their applicability to solving programming problems;	107 – 116, 346 – 370, 454 – 472
TF1.04	evaluate the efficiency of different algorithms and their applicability to solving the same programming problem;	371 – 374
TF1.05	describe the difference between procedural and object-oriented programming;	68 – 75
TF1.06	explain the levels of program correctness: syntax errors, runtime errors, valid data, invalid data, robustness	65, 128, 169 - 172

Programming Concepts		
TF2.01	describe how procedural and object-oriented programming paradigms can be used to solve different problems;	68 – 75
TF2.02	describe how user-defined types and records provide more flexible and powerful ways of handling data;	454 – 472
TF2.03	explain how recursion can be used to solve specific kinds of computing problems.	223 –225, 494 – 500
Hardware, Interfaces, and Networking Systems		
TF3.01	explain the role of a network in accessing computer software resources;	20 – 28
TF3.02	describe the issues involved in maintaining a software library (e.g., access, backup, version control);	31
TF3.03	relate hardware requirements to user software demands	44
Skills and Processes		
SPV.01	incorporate the software life cycle in project settings;	60-66
SPV.02	effectively use software development and diagnostic tools;	*
SPV.03	implement advanced data structures and algorithms;	453-521
SPV.04	identify on-line and off-line resource materials;	648, 650, 681, 711
SPV.05	use file management techniques in project settings.	
Specific Expectations		
Problem Solving, Logic, and Design		
SP1.01	devise a plan for a large software project (e.g., an accounts receivable or a random walker program), outlining the required activities at each stage of the software life cycle;	60-66, 646
SP1.02	use industry-standard methodology (e.g., flow chart, pseudocode, structure chart) in the design process;	68 – 72, 94, 100, 161, 594

SP1.03	incorporate modularity, software reuse, and maintenance considerations at the design and implementation stages of the project;	13, 67, 71
SP1.04	incorporate appropriate code from shared software libraries into software projects;	13, 67, 71
SP1.05	select appropriate data structures (e.g., arrays, records, arrays of records) for use in projects;	63, 371-374, 375-376, 453-472, 476
SP1.06	design algorithms to incorporate data structures in projects;	377, 453-472, 476
SP1.07	ensure program correctness by developing a complete suite of test data (valid and invalid data) to eliminate syntax, runtime, and logic errors;	65, 156, 173, 215 – 219
SP1.08	use a problem-solving protocol to troubleshoot computer programs.	*
Programming Practices		
SP2.01	use an integrated development environment to create and manage a project;	44 - 58
SP2.02	employ user-defined data types and record data types to improve program efficiency;	473 – 474
SP2.03	use arrays, records, and arrays of records in different project settings;	377 – 378
SP2.04	build and maintain a small software library to facilitate the reuse of code;	13, 67,71
SP2.05	incorporate appropriate maintenance considerations during the implementation of programs;	13, 35, 60, 63, 66, 74, 231, 391
SP2.06	use recursion in a simple program	225, 244, 246, 494
SP2.07	compare the effectiveness of several algorithms for solving the same problem;	491, 502, 503
SP2.08	produce comprehensive documentation (e.g., help files, manuals) for a software project;	65, 120, Appendix A 560
SP2.09	perform peer reviews of internal and external documentation;	60, 65, 74, 92, 97, 120
SP2.10	perform line-by-line walk-throughs of computer programs that include all program structures;	*

SP2.11	use appropriate research and resource materials to independently master new programming skills;	
SP2.12	effectively critique programs written by others;	*
SP2.13	log error messages and appropriate fixes.	51-53, 108, 169
Hardware, Interfaces, and Networking Systems		
SP3.01	implement a backup strategy for program files on different media;	*
SP3.02	develop software libraries in project settings;	13, 67, 71, 175, 215,
SP3.03	use predefined modules from software libraries to improve productivity.	13, 67, 71, 81-84, 99, Appendix C 648, Appendix D 681
Impact and Consequences		
Overall Expectations		
ICV.01	describe issues related to the ethical use of computers;	29 –33
ICV.02	describe the use of information technology and its impact in the community;	29 –33
ICV.03	identify postsecondary educational opportunities leading to careers in information systems and computer science;	++
ICV.04	explain the importance of employability skills and lifelong learning to information technology careers.	++
Specific Expectations		
The Ethical Use of Computers		
IC1.01	explain the importance of the ethical use of computers in areas such as software piracy, privacy, and security;	29 –33, 708
IC1.02	describe the essential elements of a code of computing ethics and why it is important to have and follow such a code;	*

IC1.03	analyse current media information relating to ethical issues in computing.	30, 32-33
Effects of Information Technology		
IC2.01	describe how local industries, businesses, or community groups are affected by the growing use of information technology to facilitate communication;	
IC2.02	describe, using presentation software, how local industries, businesses, or community groups use computers to improve efficiency and productivity to serve their clients;	
IC2.03	evaluate the pros and cons of moving to new hardware and software technologies (e.g., costs, training requirements, compatibility, deployment);	
IC2.04	use appropriate strategies to avoid potential health and safety problems associated with computer use, such as musculo-skeletal disorders and eye strain.	*
Postsecondary Education, Career Opportunities, and Employability Skills		
IC3.01	describe the range of career opportunities in computing and their lifelong learning requirements;	++
IC3.02	produce job descriptions for occupations/professions in computer and information science;	++
IC3.03	demonstrate communication skills (e.g., the ability to provide comprehensive internal documentation and the ability to explain program design and implementation clearly) in a team setting;	60, 65, 74, 92, 97, 120
IC3.04	describe the elements of working effectively in a team environment (e.g., conflict resolution, time management, constructive criticism, task assignment).	*

* indicates planned inclusion for 2nd Edition

++ Indicates coverage in *Careers in Computing* by Milbrandt and Stephenson