

**12:30 -2:50 pm Tues. & Thurs. room 1401 + other days online, item0725, Section Y1 –hybrid 5 credits**

**Prof.:** Robert Shields; **Email:** rshields at shoreline dot edu; **Tel:** (206) 546-4773

**Office** 1420 - **Hours:** see my web site (<http://shoreline.edu/rshields> ) or by appointment

**Course goals:** Understand, design and use structures to manage larger amounts of data efficiently, to create larger computer solutions. Transition from computer programming to computer science. Using techniques learned in CS& 141--control issues, such as loops, conditionals, methods, and parameter passing--CS 143 focuses on data issues. Topics include: ADTs (abstract data types), **stacks, queues, linked lists, binary trees, recursion**, interfaces, inheritance and encapsulation. The course also introduces the notion of **complexity** and performance tradeoffs in examining classic algorithms such as sorting and searching and classic data structures such as lists, sets and maps. The course will include a mixture of data structure implementation as well as using off-the-shelf components from the Java Collections Framework. The UW Equivalency Guide shows that CS143 transfers as CSE 143

**Required Text:** Building Java Programs, 2<sup>nd</sup> ed. Stuart Reges & Marty Stepp, Pearson Education/Addison Wesley, 2011, **ISBN 0-321-38283-8**. Including a valid online access key that you can use to get to the online materials.

(Used books may not have a valid access key.) Plan to read assigned chapters **at least 3 times**.

**Required supplies:** (a) USB drive (b) a 2nd USB drive for backups (c) #2Pencil (d) <4 Scantron forms.

**Optional:** You may want a different book for reference, perhaps a recent ed. by Deitel & Deitel.

**Prerequisites:** CS& 141 - Java I or instructor's permission.

**Software:** (1) The **Java Software Development Kit**, version **5 (1.5)** or later. (2) **asimple text editor like jGrasp**.

Both are in the 1300, 1400, 4102 Student Labs. <http://www.shoreline.edu/help/> lists WiFi locations

Get your **SCC ID-card**. It provides library, lab, & printing access – put \$1.00 “on the card” to print on campus.

**Computer:** Any PC with **printer, email and Internet access**. The SCC lab computers meet these requirements.

**Start here:** Check [shoreline.edu/rshields](http://shoreline.edu/rshields) for revisions to our schedule of work, due dates and style requirements.

**Read** about important matters such as grades and participation in the **separate document of** additional syllabus details; they are included by this reference. Start reading the assigned material early (perhaps today).

To master the material in this class, study all assigned readings and complete all assignments and exercises. Solo activities require you to demonstrate your mastery of material and must be done individually. Work assigned to a team must be completed and turned with full names for all team members to receive full credit. Part of the value of team activities comes from working together, at the same time and place.

**Late Work:** late work will not be accepted or graded; instead, your lowest solo project/homework score will be dropped. You cannot re-do or resubmit any work for re-grading

**Grades** No Late work will be accepted or graded. Your lowest SP score will be dropped.

Activity	Expect	Style	Weight of total points
Solo Exams	2 or 3	Objective and hands-on parts. See the schedule for dates	~50%
Solo/Programming Projects (SP)	9-12	Complete solutions: design documentation, code & listing. Solo Projects must be done alone. You may not communicate about them with anyone but the instructor.	~35%
Team (paired) exercises (TE)	weekly	To earn credit, all team exercises must be done by both members of the pair working together on each exercise.	~15%

**Be sure to add the course number (143) in the Subject line** of any email message for this class or it may be delayed. Use your Shoreline college email account for this class and for other communications with me (sign up at <http://www.shoreline.edu/StudentAccounts.aspx>). These accounts are free to you. Use clear business-style English (not text-messaging). Avoid graphics unless requested.

**Late Work:** late work will not be accepted or graded; instead, your lowest solo project/homework score will be dropped. You cannot re-do or resubmit any work for re-grading.

**Grades:** Your overall earned percentage of available points grade will be converted to the 4.0 scale in the following way. For earning the percentage listed, you will get at least the corresponding grade shown here.

90%: at least 3.5, 85%: at least 3.0, 80%: at least 2.5, 75%: at least 2.0, 70%: at least 1.5, 60%: at least 0.7

**Grades** of H, I, N, NC, P, V and Z will be assigned in accordance with SCC Policy (see the college web site for details). The P (Pass) grade cannot be assigned for averages below 2.0 (75%).

The instructor may use or grade questions/exercises that statistically partially sample the material covered and may use or grade different portions for different students. We may use web based tools such as Blackboard. Check the web site or ask me for any clarification or details on team/solo requirements for each assignment.

1. **Collaborative learning:** You will be accountable for learning, helping others to learn and presenting what you have learned in both group and individual activities. You will also be accountable for evaluating what you hear from others in your class.
  - a. Before doing any collaboration, contact me if you are unclear if collaboration is allowed or required.
  - b. Study groups are helpful when learning. Respect the ideas, time and property of others.
2. Unless my instructions specify otherwise **assume solo work**. You must do **all solo work** such as assignments, quizzes, tests, etc., **on your own. If any assignments look too similar to me, they will receive 0 credit.** See SCC Policy 5030 for details on Academic Honesty.
3. **Accommodation:** If you are a student with a special need or condition that might affect your performance or participation in this class, please let me know during the first week of class so that we can work together for your success. Students with disabilities who have accommodation needs are required to meet with a Services for Students with Disabilities program staff to establish their eligibility for accommodation. All such information is kept private. Examples of accommodations include using sign language interpreters or recording class sessions. (Visit the college website for more information.)
4. **To succeed:** You will need
  - a. Time and determination to work. You must commit about as much time as you would for a calculus class (ask previous students of this class.) Plan to spend an average of 1 to 5 hours out of class for every credit; this means 5-25 hrs/week per 5 credit course.
  - b. Willingness to experiment and ask questions.
  - c. Strategies to organize files, handouts, tests, homework, and notes to avoid lost papers or files (BACKUP your work !)
  - d. **To excel:** You must Get to class, on time. Listen, Contribute, Take notes. Complete assigned reading before class starts, do the assignments on time. Ask questions: they are free; your grade is based entirely on your earned assignment and test scores.
5. **Get help:** Don't wait. Ask questions. Come to office hours; ask for an appointment; my hours are usually flexible.
  - a. If you can't keep up with the class, see me early. There is assistance for "learning blocks" and other situations.
  - b. If you have special needs (such as, a reading problem), inform me so we can be sure you are getting the best help.
  - c. **Attendance:** -- I expect you to attend every class. You are responsible for all information given in your class, including any change of schedule or assignments. I do not take notes on questions or topics raised in class. You should exchange email addresses with other students in case you miss a class. If you suffer a disruption during the quarter, notify your instructors immediately. You can ask the Advising/Counseling Center to contact us for you. The sooner we know, the more likely we can help you to work around the problem and minimize your cost (financial, academic & emotional).
6. **Tests and assignments:** Plan ahead and ensure that the computer prints your name on all hardcopy.
  - a. **Assignments** Save all returned work. I may need it to record your grade.
  - b. Use 8-1/2 x 11 inch paper (with no "fringe") for all work handed in. Do NOT use cover sheets or binders for assignments or projects; just staple the required pages together, in order, clearly identified. Points may be deducted for submitting other pages.
7. **In-class test(s)** are due at the official end of class on the published day. See the late work policy.
8. **Quizzes** may be given anytime. **Quizzes** are due at the time announced. Late or make-up quizzes will not be accepted.
9. **Class Rules:** Do not use cell phones or pagers during class or exams, and turn off audible signals!
  - a. Only use computers for purposes appropriate to the current class topics—NOT email, surfing, chatting, instant messaging, etc.
  - b. Do not print during any class or test session without permission from the instructor.
10. **Prohibited in the computer labs** by law, school, department or instructor policy:
  - i. Smoking, drinking, or eating. Children and pets, no matter how cute, Duplication of material protected by the US Copyright Law, Playing or down loading games, Viewing or downloading pornographic or sexually offensive material
11. To protect individuals with **chemical sensitivities**, you must not wear any fragrance or perfume in (class) rooms.
12. **Weather:** Check the college web-site (<http://www.shoreline.edu/>) or phone message (206-546-4101) or KIRO, KING or KOMO radio and television stations. If Shoreline Community College is not mentioned, assume it is open. Shoreline Community College is not the same as Shoreline Public School District. Follow our schedule to prepare for class even if the campus is closed.
13. **Escape clause:** I will need to change classroom procedures and requirements if needed to reach the course goals. If I can answer questions in class I will. For questions beyond our scope or on past topics you may need to wait for time out of class.
14. **Misc:** You may be able to use an outside computer to produce work. You must be familiar with the hardware/software in class for quizzes/tests. If use of outside equipment causes minor variations in output, explain in a note on each item. You must get prior permission to use different software for assignments. It may present enhanced learning or may cause problems.
15. All storage devices must be labeled with your name and contact identification and include a plain text file named "ownerInfo.TXT" in the root directory containing your name and email, phone or other contact information.

**Before class:** Read the syllabus and additional syllabus details they apply to this class; get the required text book. Get [java](#), [jgrasp](#), visit the textbook [web site](#) to get slides & source files; Read [Javadoc](#) comments on the Sun web site.

**Do NOT send .class or .ar files** for any programs, only submit properly named .java and .txt data files as needed.

Check on my web site (<http://www.shoreline.edu/rshields/>) daily for changes to this syllabus/schedule.

All reading **before** the time class starts.

**Ch.** = chapter in the text book. Read assigned material **before class**.

**Apx.** = Appendix in the text book. **p.** = page number(s) in the text book. ) **EX** = Exercises

**SC** = Self-Check Problems – prepare for a quiz on SC from the day they are listed and after.

**TE** = Team (pair) Exercises. **To earn credit** these must include both full names and the date and exercise numbers.

You must submit all complete correct and properly labeled **TE work attached to the next week's SP listing**.

**SP**= Solo Project. **To earn credit**, I must receive all work by the due time/date listed in the current syllabus-11PM Sat.

**Paper listings** must be submitted **by the first 5 minutes of next class**. **Late Work** will not be accepted or graded.

In CS143 You must provide **separate code to thoroughly** unit test each non-private method in every SP class.

**web** = research **before class on day listed**. For each topic, you must email a 1-sentence summary and 2 non-Wikipedia

URL references. You may consult Wikipedia; but, must find and submit at least 2 other (non- Wikipedia) sources.

Week Mon.	Tues.	Wed	Thurs	Fri (no classroom)	Sat (no classroom)
1 3/28	1 <sup>st</sup> class day: Introductions: me, you, this course. By 11PM, <b>email Syllabus Quiz answers</b> . by next class: <b>read Apx C &amp; CH. 5.5</b> - Assertions <b>web1:</b> List 3 benefits of paired programming <b>web1:</b> review <a href="#">Javadoc</a> at Sun <b>web2:</b> unit testing <b>web3:</b> automated test (JUnit) <b>web4:</b> complexity class & big-Oh notation (abbreviation definitions above)	<b>TE:</b> revise the Template.java you must use perfect <a href="#">Javadoc</a> style comments with both your names. test in new folder. <b>review Ch.</b> 1-8, <b>read Apx:</b> B&D (do not use break, continue, protected or default fields)	<b>SP1</b> questions p.553#1 <b>RationalNumber</b> Do <b>not</b> store in reduced form. You must include these 3 methods: getReduced , multiply and divide You must A. meet style requirements & B. provide code to fully unit test each non-private method	ch8 <b>SC</b> 4; 7, 10, 13, 16, 23, 24; 14, 15, 18;26;27 <b>TE</b> p. 54 <b>EX</b> 1-4 Point, 9-11-Line, 13-17-Rectngle  Most test questions will be drawn from <b>SC and TE</b> <b>No late work accepted or graded</b>	Email SP code by 11PM Sat. Bring paper SP & TE to next class
2 4/4	<b>Due SP1</b> listing +TE <b>Ch. 9</b> Inheritance, Polymorphism, super interaction, Interfaces 9.1 <b>SC</b> 1-3; 9.2 <b>SC</b> 4,5, 8, 9, 11, 13 9.4 <b>SC</b> 15-18 9.5 <b>SC</b> 19, 21,23 9.6 <b>SC</b> 24	<b>web1:</b> hashing <b>web2:</b> collections <b>web3:</b> java.util generic classes & map	<b>SP2</b> questions <b>manhattan distance</b> Fix the Point class on p. 530 to meet Style Requirements. Add ex1, p. 550. Document & test Assertions for all pre & post conditions.	<b>TE</b> p. 623 <b>EX</b> 4-7 tkts 13-equals, 14-octagon, 16-increment	Email SP code by 11PM Sat.
3 4/11	<b>Due SP2</b> listing +TE <b>Ch. 10</b> Arraylists, wrappers, comparable, efficiency <b>Ch.10SC</b> 1,2-6,7,12,13,15,16,17,18	<b>web1:</b> java.util Stack + Queue <b>web2:</b> binary search	<b>SP3</b> questions <b>BankAccount</b> p. 624 #8; Design & build BankAccount class; add method MinMaxAccount. Document and test Assert pre, post cond	<b>TE:</b> p.675 <b>EX</b> 1-aveVowels 2-swapPair 5-scalebyK 9-rangeToZeros 12-markLen4(list) & markLen(count,list) 13-reverse3 17-Orderpoint	Email SP code by 11PM Sat.

Week Mon.	Tues.	Wed	Thurs	Fri (no classroom)	Sat (no classroom)
4 4/18	<b>Due SP3</b> listing +TE <b>Ch. 11</b> Collections, Lists, Sets, Maps (Did you find the typo in the case code?) 11.1SC 1-5, 9-13,16,18,19,21	<b>web1:</b> prefix, infix, postfix <b>web2:</b> recursion	<b>SP4</b> questions <b>ReverseLines</b> p.678 Document and test Assertions for all pre, post conditions	<b>TE:EX:</b> 2-alternate 4-partition, 7-countcom 8-maxlen 10-removeEven 15-maxOccurrences 17-subMap	Email SP code by 11PM Sat.
5 4/25	<b>Due SP4</b> listing +TE <b>Ch. 12</b> Recursion, mechanics, functions & data, pre, in, postfix 12.1SC 1-4, 6,7,8,10,11,13-15	<b>web1:</b> build automation (make, Ant) <b>web2:</b> BNF grammar	<b>SP5</b> questions #1 <b>OptimizedSieve</b> and #20 <b>Vocab</b> w/sets <b>Study for Mid-term Exam</b>	<b>TE:EX:</b> 1-starStrng 3-writeSequence 5-writeBinary 6-writeSquares 9-sumTo 11-isReverse 14-permute	Email SP code by 11PM Sat.
6 5/2	<b>Due SP5</b> listing +TE <b>Exam 1:Ch.1-12.</b> <b>1 page of notes</b> (no books)	<b>Ch. 13</b> search & sort libraries, implementation, complexity SC: 1-5, 9,11,12,14	<b>SP6</b> questions <b>HtmIValidator</b> see web for details, esp. split syntax \\  and \\.	<b>TE:EX:</b> 1,2,4,5,8,9 (optional 11)	Email SP code by 11PM Sat.
7 5/9	<b>Due SP6</b> listing +TE <b>Ch. 13 &amp; 15</b> Arraylist implementation, generic 15SC 1-3, 5-7, 9, 10, 13-15, 17, 20, 21, 23	<b>web1:</b> <a href="#">dbILL1</a> , <a href="#">dbILL2</a> , <a href="#">dbILL3</a> <b>web2:</b> revision control (Git)	<b>SP7</b> questions <b>BnfGrammar</b> see web for details (use recursion based on p.773)	<b>TE:EX:</b> 2, 3, 6, 9, 12, 14, 15	Email SP code by 11PM Sat..
8 5/16	<b>Due SP7</b> listing +TE <b>Ch. 16</b> Linked lists, implement, nodes, generic 16SC 1-3, 5, 6, 10, 12, 14, 16, 19-27, 29, 31-33	<b>web1:</b> trees <b>web2:</b> heaps <b>web3:</b> Huffman coding	<b>SP8</b> questions <b>AssassinManager</b> (if you prefer,change it to <b>HugManager</b> ) see web for details	<b>TE:EX:</b> 5, 6, 8, 9, 11, 12, 14, 18 (optional 20)	Email SP code by 11PM Sat.
9 5/23	<b>Due: SP8</b> listing +TE <b>Ch. 17</b> Binary trees, nodes, implement, traversal, sum, count, search, complexity 17SC 1-5, 7-17, 21-25, 27	<b>web1:</b> mergesort <b>web2:</b> quicksort <b>web3:</b> heap sort	<b>SP9</b> questions <b>20Questions</b> see web for details	<b>TE:EX:</b> 2, 4, 6-10, (optional 16, 18)	Email SP code by 11PM Sat.
10 5/30 Hol Mem Day	<b>Due:SP9</b> listing +TE review <b>Ch. 8-17</b>	<b>web1:</b> B-tree	<b>SP10</b> questions <b>HuffmanCoding</b> see web for details		Email SP code by 11PM Sat.
11 6/6	<b>Due: SP10</b>	<b>Prep. day</b>	<b>Final Ch.9-17 date tbd</b>	<b>1 page of notes</b>	