

The University of Western Ontario  
London, Ontario, Canada  
Department of Computer Science

COMPSCI 2034B / DIGIHUM 2144B  
DATA ANALYTICS: PRINCIPLES AND TOOLS  
Winter 2023 (0.5 Credit Course)

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<b>Instructor:</b>	Daniel Servos	<b>Time:</b>	Tuesday 2:30PM – 4:30PM
<b>Email:</b>	<a href="mailto:dservos5@uwo.ca">dservos5@uwo.ca</a>	<b>Place:</b>	MC-110
<b>Office:</b>	MC387 (Office hours by appointment)		

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## 1 Course Description

A comprehensive and interdisciplinary introduction to data analytics using modern computing systems, with equal attention to fundamentals and practical aspects. Topics include sources of data, data formats and transformation, usage of spreadsheets and databases, statistical analysis, pattern recognition, data mining, big data, and methods for data presentation and visualization.

## 2 Learning Outcomes

By the end of this course, students will be able to:

- Describe types, sources, and facets of data.
- Use spreadsheets, macros and VBA to analyze data.
- Utilize programming constructs to process data.
- Explain relevant statistical analysis and machine learning techniques.
- Evaluate different visual artifacts for data presentation.
- Choose data analytics tools appropriate for data problems.

## 3 Textbook

There are no required textbooks. However, freely accessible readings will be assigned throughout the term.

## 4 Instructor

Daniel Servos

**E-Mail:** [dservos5@uwo.ca](mailto:dservos5@uwo.ca)

**Website:** <http://danielservos.ca>

**Office:** Middlesex College, Room 387 (MC387)

**Office Hours:**

- Wednesdays from Noon to 3:00PM (by appointment)

Office hour appointments must be requested via <http://danielservos.ca/apt> at least 24 hours before the desired date. The number of appointments available each day is limited and will be scheduled on a first-come first-served basis. No office hours will be held on the week of February 16th (reading week).

## 5 Teaching Assistants

Teaching Assistant (TA) contact information and consulting hour details will be posted on OWL when available.

Teaching assistants will hold an open consulting hour each week. No appointment is required to attend a TA's consulting hour. No consulting hours will be held on the week of February 16th (reading week) or after April 6th.

## 6 Lectures

There will be one lecture held each week in MC-110 at the following time:

- Tuesday 2:30PM - 4:30PM

Students are expected to bring blank paper and writing implements to each lecture. A laptop, tablet, phone or other electronic device capable of connecting to the internet and viewing web pages is also strongly recommended (required for participation in some in-class activities).

## 7 Course Website & E-Mail Communication

This course uses the Online Western's Learning (OWL) system (<https://owl.uwo.ca>).

Announcements, assignments, labs, lecture notes, and other course-related information will be posted on this website. It is the responsibility of the student to ensure their UWO account is operational for both E-Mail and using the OWL course site and routinely check both for updates.

Before sending questions to the course instructor, please first check the course syllabus (this document), the OWL course site and the OWL course forums before sending your inquiry. **General questions that may be helpful to other students (and do not contain personal information) should be posted to the OWL course forums so that others may benefit from the answer.** E-mail messages should be sent from your UWO e-mail account and include "CS2034" in the subject line to avoid any spam filters.

You can normally expect a response with-in 2 business days. E-mails sent on weekends and holidays will be responded to the following working day when possible. Please ensure enough time is available for a response when asking questions regarding assignments that are nearing a deadline.

## 8 Evaluation

Element	Weight
Assignments (3)	20%
Labs (10)	15%
Participation	10%
Midterm	20%
Exam	35%

If an assignment, quiz or lab has to be cancelled for any reason, the remaining assignment/quiz/lab weights will be prorated (scaled) to add up to the total weight for that element.

## 8.1 Assignments

- There will be 3 assignments.
- Tentative assignment schedule (dates subject to change) and weights are as follows:

Assignment #	To Be Posted On	Due On	Weight
1	January 23rd	February 10th	5%
2	February 13th	March 3rd	5%
3	March 20th	April 3rd	10%

- Assignments are due 5 minutes before midnight (11:55PM) of the due date.
- All submissions will be submitted electronically. Details will be given in the assignment descriptions.
- This course uses a late coupon system:
  - Each student starts the course with 5 late coupons.
  - One late coupon can be used to push an assignment due date back by 1 day (up until 11:55PM the next day).
  - At most 3 late coupons can be used per assignment.
  - If you have no late coupons remaining or your assignment is more than 3 days late, a zero grade will be given.
  - Late coupons will be tracked through a gradebook item on OWL. It is the students responsibility to ensure they have enough remaining if they submit late.
  - Late coupons must be used before special circumstances are considered.
  - After all late coupons are used, no extensions will be given for assignments except for in the event of serious medical or compassionate grounds. A student must follow the procedure for Academic Accommodation for Medical Illness as given in this document.
  - No action is required on your part to use a late coupon. They will be automatically applied by the TA if you submit late.
- Assignment descriptions will be posted on the course website by the dates listed above.
- Any changes, updates, and clarifications to assignments will also be posted on the website. It is your responsibility to monitor these pages closely.
- A program that produces the correct output is not necessarily a “working” program; it must also satisfy the specifications given in the assignment description.
- Your assignment solutions are expected to be your own individual work, not the products of group effort. **You may not share your assignment solutions** with another student for any reason nor are you to request solutions from another student or make use of solutions available on-line. Such sharing of solutions is considered a scholastic offence and will be penalized as such.
- It is your responsibility to keep up-to-date off-site backups (e.g. on OneDrive or Dropbox) of assignment files. Retain copies of all material handed in, as well as the graded assignment, to guard against the possibility of lost assignments or errors in recording marks. You should keep these materials until you are satisfied that your final mark for the course has been computed properly.
- Assignments will be marked by the TAs, who follow marking schemes provided by the instructor.
- Every effort will be made to have assignments marked and handed back within 3 weeks after the due date, preferably sooner. When assignment marking has been completed, you will be informed via the course website and/or e-mail.
- You should direct any questions or appeals about marking to your TA. If your discussion with the TA is not satisfactory, you may further discuss the issue with the course instructor.

- A request for an adjustment in an assignment mark must be made within 1 week following the date the assignment is returned. All assignment marks are considered to be final after that date.
- The course instructor reserves the right to completely remark an appealed assignment. This may raise or lower the grade compared to that given by the TA.

## 8.2 Labs

- **Labs start the week of January 17th and run to March 28th.**
- There will be 10 equally weighted two-hour labs, worth approximately 1.5% each.
- See the [Western Timetable](#) for location and time information.
- Labs will be run by TAs and act as practical tutorial sessions that may cover new material or review concepts discussed in lectures. Collaboration on lab problems with other students is allowed and encouraged.
- Lab descriptions will be posted on the OWL course site weekly on Mondays. Any changes, updates, or clarifications to labs will also be posted on the website. It is your responsibility to monitor these pages closely.
- It is expected that you read over lab materials beforehand and come prepared to lab sessions with any required resources or reference material.
- As seating in labs is limited, **you are required to attend the lab section you are registered in.**
- To obtain full marks for a given lab session, you must attend the lab in person and complete the lab to the TA's satisfaction (see the Lab Rubric at the end of this document for details on how lab marks are evaluated).
- TAs may give a zero or reduced lab mark to students that are late to or do not work on lab material during the lab session. It is expected that students abstain from working on assignments during lab time until they have completed and received a mark for the lab.
- **Labs can not be made up for in future lab sessions or submitted via e-mail.**
- Labs missed as part of an approved accommodation (e.g. medical illness) will result in the student's lab mark being re-weighted to not include the missed lab. Please contact the course instructor as soon as possible if you have an accommodated lab absence.

## 8.3 Participation

As Computer Science is a highly collaborative field, it is important to develop the skills and tools you need to work with others on complex programming and technical problems. For this reason, CS2034/DH2144 makes heavy use of active learning and group work during in-class activities. It is expected that you will be an active participant in all course activities and come prepared by reading the required readings before class each week.

Participation will be tracked using "participation points" that are awarded for different activities that demonstrate engagement and participation in the course, aiding other students, completing in-class activities, answer questions in-class, or making meaningful contributions on the course forums.

The following are examples of activities that award participation points (other opportunities may be added at the instructor's discretion):

Activity	Participation Points	Description
<b>Completing in-class activities</b>	10 to 100	In-class lectures may include a group work activity or tutorial section that asks you to work with a group to complete a small poll, quiz, short written response, or other activity. Completing these (even if your answer is incorrect) will award points. These activities must be done in-class during the designated time and recorded through the <a href="http://cs1.ca">http://cs1.ca</a> tool. For full points a proper summary of the activity must be submitted through the tool. Most (but not necessarily all) weeks will have at least two activities worth 150 points in total.
<b>Participation tickets</b>	50	During in-class lectures the instructor may award participation tickets for answering a question out loud in-class or otherwise showing involvement in the lecture. These tickets will award 50 participation points if entered into the <a href="http://cs1.ca">http://cs1.ca</a> tool. Tickets must be entered into the tool within one week of being issued.
<b>Answering questions in-class using the in-class response tool</b>	0 to 20	During in-class lectures the instructor may occasionally ask questions to the class. If you answer these questions via the <a href="http://cs1.ca">http://cs1.ca</a> tool, a small amount of participation points may be awarded based on the quality of your answer and the question being asked. Responses must be made in a reasonable time frame after the question is asked. <b>At most 300 points can be earned from answering question this way.</b>
<b>Asking a meaningful question on the course forums</b>	0 to 50	Asking a meaningful question on the course forums about the course content or assignments that is not clearly answered elsewhere or already asked by another student. To count, the question must be posted in the correct section/subforum and asked in good faith (i.e. not to simply gain points). Most meaningful questions will be given 25 points on average depending on the quality. <b>At most 300 points can be earned from asking/answering questions.</b>
<b>Answer a question on the course forums</b>	0 to 50	Answering an unanswered question posted by another student on the course forums in a meaningful way or significantly adding to an already answered question. To count, the answer must be posted in in good faith. No points will be awarded to students working together to post/answer questions purely for points. Most meaningful answers will be given 25 points on average depending on the quality. <b>At most 300 points can be earned from asking/answering questions.</b>

<p><b>Posting a new resource to the course forums</b></p>	<p>0 to 100</p>	<p>Posting links to free resources that cover topics discussed in the course or go into additional depth about these topics. These resources must be posted to correct forum to count and must have not already been posted elsewhere (either by other students or mentioned by the instructor in the course resources). Most meaningful posts of resources will be given 25 points on average depending on the quality and number of resources posted. <b>At most 300 points can be earned from posting resources.</b></p>
<p><b>Posting a tutorial, you wrote your self</b></p>	<p>0 to 200</p>	<p>Posting a small practical tutorial about how to accomplish some task in the software we are using. The tutorial may be text, image, or video based and not already covered in the course materials or posted by another student. The tutorial must be your own work and not copied from another source. If you use any resources from others, they must be properly cited. Most meaningful and high-quality tutorials will be given 100 points on average depending on the quality, length, effort put into the tutorial. <b>At most 500 points can be earned from posting tutorials.</b></p>

Participation points will be converted into percentage (out of 10%) to calculate your final participation mark using the following table:

Level	Grade (out of 10%)	Minimum Participation Points Required
0	0%	0
1	1%	300
2	2%	600
3	3%	900
4	4%	1000
5	5%	1200
6	6%	1500
7	7%	1800 (it should be possible to accumulate this many points from only in-class activities).
8	8%	1975
9	9%	2150
10	10%	2200 (it should be possible to accumulate this many points by completing all in-class activities, earning 4 participation tokens, and making 4 high quality forum posts. Many other combinations are also possible.).

11	10% + up to 2% bonus to final grade (depending on number of extra points past 2300), Final grade can not be over 100%.	2300
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No fraction of percentages will be granted for participation. You must make it to the next level to increase your participation grade. For example, 1150 points would still be a level 4, worth 4%.

The final subjective decision of what constitutes a “meaningful contribution” or how many points are assigned for a contribution is at the sole discretion of the course instructor. Quantity of posts or contributions is not a substitute for quality and multiple low-quality contributions do not add up to one meaningful contribution.

If for any reasons the course must be moved online for a period of time, the in-class activities may be offered asynchronously online. In such a case, you may be required to have a webcam and microphone.

### 8.3.1 Missed In-Class Activities

Missed in-class activities can be made up for by making additional high-quality contributions on discussion forums, earning participation tickets, or answering questions via the <http://cs1.ca> tool. As such, no accommodation will be given for missed class due to illness or other circumstances as a method to make up these missed activities is already available.

### 8.3.2 Disruptive Behaviour

In the instructor’s sole discretion, participation points may be removed for disruptive in-class or online behaviour including but not limited to talking during inappropriate times, inappropriate comments, or failing to work well with other students during group work activities. Participation points may also be removed for attempting to “cheat” the participation system. For example, submitting in-class group work for students not in attendance or giving a participation ticket to a student that did not earn it. Spamming the discussion forums or the in-class response system with low quality posts purely to inflate your participation mark may also be penalized.

## 8.4 Midterm & Final Exam

- Tentative exam dates are as follows:

#### Midterm Exam

**Date:** Saturday March 11th (tentative)

**Time:** To be determined (2 hours)

**Location:** To be determined

**Format:** Mixed (Multiple Choice, Short Answer & Programs)

#### Final Exam

**Date/Time/Location:** Scheduled by the registrar’s office during the Winter exam period.

**Format:** Mixed (Multiple Choice, Short Answer & Programs)

- Both exams will be comprehensive and may include anything covered in lectures, labs, assignments, and assigned readings up until that point in the course.

- No electronic devices of any kind, including but not limited to calculators, phones, laptops and smart watches, will be allowed during the examinations.
- One page of handwritten notes (cheat sheet) will be allowed for both the midterm and final exam. This page must be one-sided and of standard letter (8.5 x 11 inches) size. Notes must be readable without the use of any special device or magnification. Any notes not conforming to these rules will not be permitted and removed at the start of the exam.
- There will be no make-up midterm exam. Students absent due to an approved accommodation (see Section ??) will have their final exam mark reweighed to include the weight of the midterm exam.

## 9 Scholastic Offences & Academic Dishonesty

To preserve a fair and honest learning environment for all, scholastic offences and any breach of ethical conduct will not be tolerated and punished according to department policy. In addition, to the offences outlined in the department and university policy, the following will be considered academic misconduct:

- Sharing assignment solutions with other students or posting them on-line in a manner that is accessible to other students (e.g. Course Hero, in Facebook groups, via Discord, etc.).
- Using any part of another students assignment solution including but not limited to formatting and templates.
- Sharing your account or using another student's UWO account in any way.
- Submitting a Group Work Code for an activity you did not participate in or were absent for.
- Submitting a participation ticket that you did not earn yourself.
- Sharing or giving a Group Work Code or participation ticket to another student.
- Attempting to circumvent or in any way manipulate the systems in place for monitoring participation or attendance (CS1.ca ASKTool, etc.).
- Altering a midterm or exam in any way after it has been graded.
- Misrepresenting work done during labs with the intent to receive a higher lab grade.
- Taking the place of another student in labs sessions, exams, midterms, etc.
- Any other offences listed in a department or university policy.

Assignment will be subject to metadata analysis to detect sharing of files and solutions. Any offences, misconduct on assignments, quizzes and labs will result in a 0% grade for that assignment/lab/quiz in addition to any penalty deemed appropriate by the department/program. Offence relating to misconduct on any participation component will result in a 0% overall participation grade and any additional penalty deemed appropriate by the department/program.

## 10 Email Contact

We occasionally need to send email messages to the class or to students individually. Such emails are sent to the UWO email address as assigned to you by Information Technology Services (ITS), i.e. your email address @uwo.ca. It is your responsibility to read your email account on a frequent and regular basis, or to have it forwarded to an alternative email address if preferred. See the ITS website for directions on forwarding email.

However, note that the email at ITS (your UWO account) and other email providers may have quotas or limits on the amount of space they dedicate to each account. Unchecked emails may accumulate beyond those limits and you may be unable to retrieve important messages from your instructors. Losing emails is not an acceptable excuse for not knowing about the information that was sent.

Students are encouraged to contact their course instructor via e-mail with brief, e-mail appropriate questions regarding lecture materials or clarification of assignments. However, before sending email to the instructor,



the student should check the course website to see if the requested information is already there and post on the OWL forums if appropriate. Students must send emails from their UWO ITS account and include “CS2034” in the subject line of the email.

## 11 Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor.

In the event of a move to 100% online learning, the final exam will be conducted online using OWL and Proctortrack. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. More information about this remote proctoring service is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service, including a webcam. Information about the technical requirements are available at the following link:

<https://www.proctortrack.com/tech-requirements/>

## 12 Student Absences

### 12.1 Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration by providing valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University’s medical illness policy at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf)

The Student Medical Certificate is available at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences must be submitted to the Academic Counselling office of a student’s Home Faculty.**

### 12.2 Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

**Note:** missed work can only be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

## 13 Accommodation and Accessibility

### 13.1 Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University’s list of recognized religious holidays (updated annually) at:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

### 13.2 Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/AcademicAccommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/AcademicAccommodation_disabilities.pdf)

## 14 Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf),

the centrally administered e-mail account provided to students will be considered the individual’s official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

Assignments may be subject to submission for textual similarity and metadata review to plagiarism detection software for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the TurnItIn service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

## 15 Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/-dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at:

[https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html)

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at:

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.

## CS2034/DH2144 Lab Rubric

Name: \_\_\_\_\_

Total: \_\_\_\_ / 10 marks\*

	<b>Exemplary (10 marks)</b>	<b>Above Average (9 - 8 marks)</b>	<b>Satisfactory (7 - 6 marks)</b>	<b>Needs Improvement (5 - 0 marks<sup>†</sup>)</b>
	<ul style="list-style-type: none"> <li>• All required components of lab completed and correct.</li> <li>• Demonstrates understanding of lab content and correctly answers questions about their work.</li> <li>• Arrives on time and prepared for the lab with all required prelab readings and activities completed.</li> </ul>	<ul style="list-style-type: none"> <li>• Most required components of lab completed.</li> <li>• Few or insignificant errors in work.</li> <li>• Likely that lab could be completed correctly if more time was given.</li> <li>• Demonstrates understanding of completed lab content and correctly answers questions about their work.</li> <li>• Arrives on time and prepared for the lab with all required prelab readings and activities completed.</li> </ul>	<ul style="list-style-type: none"> <li>• At least half of lab content is completed.</li> <li>• Several or significant errors in work.</li> <li>• Likely that errors could be corrected if more time was given.</li> <li>• Likely that most of lab could be completed with more time.</li> <li>• Demonstrates some understanding of completed lab content and able to explain most completed work.</li> <li>• Arrives on time and with most prelab readings and activities completed.</li> </ul>	<ul style="list-style-type: none"> <li>• Majority of lab tasks are incomplete.</li> <li>• Many significant errors in work.</li> <li>• Unlikely that errors could be corrected if more time was given.</li> <li>• Unlikely that most of lab could be completed with more time.</li> <li>• Fails to demonstrate understanding of lab content.</li> <li>• Arrives late, without prelab readings and activities completed.</li> </ul>

\* Some labs may have a bonus/optional part that will allow for a grade over 10. Bonus marks can make up for labs with less than a 10/10 mark but not raise the overall lab grade above 15% of your final grade.

† Lab absences will result in a grade of 0/10 for the missed lab.