

Course Syllabus
CP212 Windows Application Development
Winter 2019
Physics & Computer Science, Faculty of Science
Wilfrid Laurier University

Last update: December 23, 2018 v0.1

Instructor

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Course Website: MyLearningSpace CP212 Section B

Course Information

This course is designed for students who have a basic understanding of spreadsheets, word processors, and databases as well as introductory programming experience. The course introduces methods to automate repetitive tasks and create user-friendly applications in spreadsheets, word processors, and databases using the powerful macro language, Visual Basic for Applications (VBA).

Topics include a review of programming constructs such as data types, conditional logic, looping, and arrays; an introduction to Excel objects and OOP concepts; the design of graphical interfaces with typical Windows software look & feel, such as forms and dialog boxes with controls and event handling that respond to user input; data driven applications; modular design; task automation.

Delivery: 3 lecture hours, 1 lab hour / week (labs begin on the second week)

Credit: 0.50

Prerequisite: CP104 or CP102 plus previous programming experience

Textbook: VBA for Modelers – 5th Edition

Course Overview and Methodology

This course is first and foremost a computer science course aimed at teaching computer programming skills and concepts. It is presented as two lectures per week and one lab per week. During the labs, students will receive a short lesson from the Lab Instructor and then may be given tasks to complete which will make up the Lab portion of their course marks. Material on the midterm and final exam will come primarily from the lecture and textbook material but may contain coding questions based on lab material. This course is taught using Visual Basic for Applications (VBA) which is the language of macros in Microsoft Office and other popular software packages in a number of disciplines. While the textbook focuses on Excel and financial applications, these aspects represent the problem domain for our programming efforts but not the

core topic itself. In other words, this is not an Excel course or a business course: It is a computer programming course. However, using Excel and related common tasks provide a useful backdrop to learn and demonstrate the practicality and utility of VBA as a programming language.

Lecture notes may be posted, **where applicable**, but in many cases, there will be no relevant notes. Frequently, the lectures involve live coding demos and you are encouraged to follow along: You can't become a competent developer by reading notes. This is not a content memorization course: You will need to learn to program through practice and repetition. Lectures are typically based on the textbook material and purchasing your own copy of the textbook is highly recommended. Many students from past terms have remarked on the usefulness of the textbook as a reference. This is especially important if you have a limited programming background. For help on taking notes during lectures, consider visiting the people at [Learning Services](#).

It is recommended that you print this syllabus for reference during the course. Note that the contents might be periodically updated and the latest version will be available on the course website.

Course Goals and Learning Outcomes

This course aims to build on students' existing programming skills through the introduction of VBA as development platform with Excel related tasks as the application domain. You must have taken at least one programming course in high school or university, as programming experience is assumed. An understanding of common Excel usage is also strongly recommended.

By the end of this course you should have accomplished the following goals:

- Have a thorough command of the VBA language, as well as an understanding of general programming concepts and practices that can be migrated to other languages
- Automate various facets of Excel spreadsheet usage
- Develop complete VBA applications, including user friendly graphical interfaces
- Understand and implement error handling and data driven applications
- Understand OOP concepts, modular design, and project architecture

Class Schedule (Tentative and subject to change)

Week	Textbook Chapters / Readings	Lab	Lab Content
1	1, 2, 3		NO LAB
2	4, 5	1	Spreadsheet Applications with No VBA
3	6	2	Programming Basics
4	7	3	Working with Ranges
5	8, 9	4	Logic and Loops
6	Midterm on Wednesday	5	Arrays, 2D Arrays
READING WEEK (Feb. 18-22)			NO CLASSES
7	10, 11	6	GUI Design

8	12, 14	7	Input Validation and Error Handling
9	13, 15	8	Reading from a Database (Access, SQL)
10	16, 17	9	Writing to a Database (Access, SQL)
11	18	10	Modify the Ribbon with Custom UI
12	Review	11	User Defined Types and Classes

Table of Contents from *VBA for Modelers*

Part I: VBA Fundamentals

1. Introduction to VBA Development in Excel
2. The Excel Object Model
3. The Visual Basic Editor
4. Recording Macros
5. Getting Started With VBA
6. Working with Ranges
7. Control Logic and Loops
8. Working with Other Excel Objects
9. Arrays
10. More on Variables and Subroutines
11. User Forms
12. Error Handling
13. Working with Files and Folders
14. Importing Data into Excel from a Database
15. Working with Pivot Tables and Tables
16. Working with Ribbons and Menus → Modifying the Interface: Ribbon X
17. Automating Solver and Other Add-Ins
18. User Defined Types, Enumerations, Collections and Classes

Part II: VBA Management Science Applications

Part two of the textbook consists of Chapters 19 - 35 in which each chapter discusses a complete application used in Management Science such as production planning, stock pricing, work scheduling, and queuing simulations. Some applications are referenced throughout the course, but the focus of the course is not on management science and the applications will be useful to the student to examine but most applications will not be covered in detail in class.

Student Evaluation

Assignments	25%
Midterm	15%
Lab	30%
Final Exam	<u>30%</u>
Total	100%

Assignments

This course requires the completion of four individual and original assignment submissions (i.e. no collaboration, no copying, no downloading, no recycling, etc.). The assignments form 25% of the overall grade but the weighting is not equal, with the last assignment being worth considerably more than the others. The final assignment is intended to allow developers to showcase their full knowledge of the VBA language and is essentially a course project. It is advisable to begin planning for the fourth assignment as early as possible.

Your assignments must be uploaded to [MyLearningSpace](#) before the due date: **Late assignments will not be accepted.** It is better to plan on submitting partially completed work than to hope for an extension or a late penalty, as **these will not be granted** except in the most exceptional cases. Unless otherwise instructed, you must **submit your assignment as a single .xlsm** file: Do not zip your files. Incorrect file extensions or zipped submissions will not be marked and receive a grade of zero. Note, the final assignment might require the submission of multiple files and the instructions for how to submit them will be provided in the assignment specs.

Assignment Due Dates (Tentative and subject to change)

Assignment	Due Date	Weight
A1: Spreadsheet App	Sun Jan. 27, 2019 11:00pm [End of Week 3]	4% of Final Mark
A2: VBA App I	Sun Feb. 17, 2019 11:00pm [End of Week 6]	5% of Final Mark
A3: VBA App II	Sun Mar. 17, 2019 11:00pm [End of Week 9]	6% of Final Mark
A4: Your Custom VBA App	Sun Apr. 07, 2019 11:00pm [End of Week 12]	10% of Final Mark

CP212 Programming Style Guidelines

Your submitted files should always use the following file naming convention:
yourNetworkUsername_assignmentNumber.xlsm (e.g. veyx1234_A1.xlsm).

All modules should begin with these lines of code:

Option Explicit

```
'==== CP212 Windows Application Programming =====
```

```
' Name:
```

```
' Student ID:
```

```
' Date:
```

```
' Program Title:
```

```
' Description:
```

```
'=====
```

Assume that each of your assignments will be examined by someone with moderate programming experience; someone who is not interested in cute or funny comments; someone who doesn't necessarily share your understanding of the problem domain: Your source code must be clearly commented. Specifically, include a general comments block that explains the overall purpose of each module, sub, and function. In addition, you should comment most lines of code except for those that are extremely simple. For example, the line: $i = i + 1$ does not need a comment saying that i is incremented by one. In general, if in doubt, add a comment.

Marks will be deducted from the Appearance/Aesthetics component of the marking scheme or from the total as a whole (but generally never twice for the same problem) for the following:

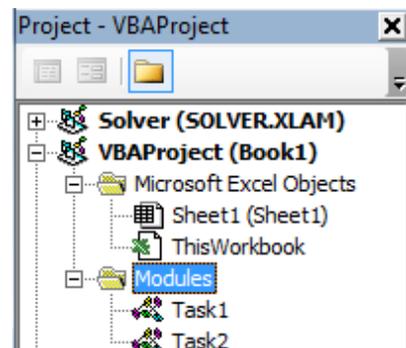
- poor or non-standard programming practice
- poor use of comments (not too few, not too many)
- poor cell formatting (not formatting values as Currency when they clearly are)
- not using modular programming where appropriate
- on userforms, not clearly explaining what type of data is expected from the user if not obvious (for example, entering interest rates as percent or decimal values)
- results in message box is poorly formatted (no spacing, bad punctuation etc.)
- button text is unreadable, missing or inappropriate
- numeric results in a spreadsheet should be in separate cells than the text that describes them

Lab Policy

During lab you will be asked to complete a number of short tasks which usually require a solution to be coded using VBA. Since the labs are only 50 minutes long, you will be asked to work on your tasks until they are completed, test them to make sure they work correctly, and then raise your hand to have your tasks marked by your IA. Note, **tasks will not be remarked**, so make sure they are correct to the best of your abilities before you raise your hand to be marked. After your lab has been graded, **you must submit your work to the corresponding dropbox on [MyLearningSpace](#)** to receive the grade. Remember to use the correct file extension for your submission.

It will be helpful to keep the code for each task in a separate code module to allow marking of the code to be completed quickly. Also, each programming task should have a button placed on the worksheet (if appropriate) to execute the macro/subroutine that solves the problem.

When completing your assignments, make sure you store your code in modules according to code function and clearly name the modules according to the code that is located inside (see figure). For example, you might have modules called "FileCode" or "DataValidation" or some other grouping appropriate for the assignment. If the assignment was just to write code for a car loan application, the module might be called "Car Loan". Modules can be exported and reused in other projects by importing them, so consider writing your code in a modular fashion that makes this easier to accomplish. This will be covered later in the course and takes some experience to get used to.



Course and University Policies

1. **Academic Integrity/Misconduct:** Laurier is committed to a culture of integrity within and beyond the classroom. This culture values trustworthiness (i.e., honesty, integrity, reliability), fairness, caring, respect, responsibility and citizenship. Together, we have a shared responsibility to uphold this culture in our academic and nonacademic behaviour. The University has a defined policy with respect to academic misconduct. You are responsible for familiarizing yourself with this policy and the penalty guidelines, and are cautioned that in addition to failure in a course, a student may be suspended or expelled from the University for academic misconduct and the offence may appear on their transcript. The relevant policy can be found at Laurier's academic integrity website (www.wlu.ca/academicintegrity) along with resources to educate and support you in upholding a culture of integrity. Ignorance of Laurier's academic misconduct policy is not a defense.
2. **Special Needs:** Students with disabilities or special needs are advised to contact Laurier's Accessible Learning Centre (see: <https://wlu.ca/accessibility/index.html>) for information regarding its services and resources. Students are encouraged to review the Calendar (see: <http://www.wlu.ca/calendars/index.php?cal=1&y=69>) for information regarding all services available on campus.
3. **Midterm Exam: Students must write the midterm exam.** In exceptional cases of fully documented injury, illness, or other exceptional circumstances where a student is prevented from writing the scheduled exam, that student's final exam will be reweighted to equal the sum of the midterm and final exams. No makeup exam will be provided.
4. **Final Exam: Students must pass the final exam to pass the course.** You will also not pass the course without completing the majority of lab work and other coursework including, but not limited to, assignments.
5. **Foot Patrol:** The Foot Patrol service (see: <http://yourstudentsunion.ca/service/foot-patrol/>) is a service provided to evening students by students. If you feel unsafe walking home or uncomfortable walking to your vehicle, call WLU FOOT PATROL and someone will escort you. Ext. 3668 or 886-FOOT (**886-3668**)

The Academic Date section of the Calendar (printed and web site versions) clearly states the examination date period for each semester. **Students must note that they are required to reserve this time in their personal calendars for the examinations.**

Students who are considering registering to write MCAT, LSAT or GMAT or a similar examination, should select a time for those examinations that occurs outside the University examination period. For additional information that describes the special circumstances for examination deferment, please check the following web page of the Undergraduate Calendar:

<https://legacy.wlu.ca/calendars/section.php?cal=1&s=768&sp=2726&ss=3229&y=69#DeferredExaminationPolicy>.

Course Tools and Learning Materials

1. Textbook – **VBA for Modelers, 5th Edition** - Developing Decision Support Systems with Microsoft Office Excel
2. Course Management Page – [MyLearningSpace](#)
3. Learning Services (writing centre, math help, academic advising, study skills/supplemental instruction) – [Learning Services](#)

Guidelines for Technology Use During Class and During Course Assessment

Adhering to the University's policy on the use of electronic devices ([Policy 9.3](#)), it is important for you to realize that the use of electronic devices such as cellphones, laptops, and tablets for non-academic use during lectures, labs, and assessments is prohibited.

Copyright Warning: You *do not have my permission* to electronically record the lectures, redistribute or disseminate course materials, post course content online, or engage in any other actions that constitute a violation of copyright.

Answering messages, using social networking sites, or gaming are distracting practices that reduce the ability for you to learn the material that is provided. You are a distraction to others in the room as well as the instructor, so electronic devices will only be used for academic purposes. Please turn off and put away all devices during lectures, labs, and midterms so you do not distract others, and so that your potential for learning is increased. This also helps maintain academic integrity by removing possible avenues for cheating. If you have personal reasons that require the use of a cellphone for emergency contact reasons, please contact me to discuss them so we can make appropriate arrangements. Note that it is against the examination policy to have your cellphone with you at your desk during final exams.

Copying From Web = Academic Misconduct

This is a second year programming course and you are expected to learn how to program in VBA by the end of the course. **The textbook should be your primary reference.** You should never have to use Google or other search engines to find answers to your programming problems, because the required code is either in your textbook or the course notes, or you are to use basic programming techniques to develop solutions to the problems presented.

Copying source code (programming code) from other sources is considered an Academic Misconduct and will not be tolerated. Under no circumstances should your assignments or final project contain code that was found on the World Wide Web. If you are not sure how to complete a task in VBA, please consult your professor or lab instructor.

There are several reasons why copying from the Internet is prohibited:

- Presenting someone else's work as your own constitutes academic misconduct
- You could be infringing on someone else's copyright if they did not give you permission
- Online code is frequently incorrect or very specific to a certain context and it can require more time to debug it than to write on your own
- Repetitive attempts at coding your own solutions are the only way to become a better developer

General Regulations

PHYSICS AND COMPUTER SCIENCE

For full department regulations see:

<https://bohr.wlu.ca/courses/regulations.php>

Examination Deferrals

The Academic Date section of the Calendar (Printed and Web Site Versions) clearly states the examination date period for each semester. Students must note that they are required to reserve this time in their personal calendars for the examinations. The examination periods:

WINTER 2019: April 10 - 30

Students who are considering registering to write MCAT, LSAT or GMAT or a similar examination, should select a time for those examinations that occurs outside the University examination period. For additional information that describes the special circumstances for examination deferment, consult the University calendar.

Academic and Research Misconduct

Academic misconduct is an act by a student, or by students working on a team project, which may result in a false evaluation of the student(s), or which represents a deliberate attempt to unfairly gain an academic advantage. Academic misconduct includes: please refer to

[Academic Misconduct Procedures](#)

Accessible Learning Centre

Students with disabilities or special needs are advised to contact [Laurier's Accessible Learning Centre](#) for information regarding its services and resources, ext. 3086. Students are encouraged to review the Calendar for information regarding all services available on campus.

Learning Services

There is a range of academic learning support services offered at Laurier designed for all students who want to improve their academic achievement in the classroom. These services include the following specific areas:

- Central Academic Advising Office
- Mathematics Assistance Centre
- Study Skills and Supplemental Instruction Centre
- Writing Centre

Visit the [Learning Services](#) web page for detailed information

Laurier Email Account

Our official means of communication is with your Laurier email account. Students are expected to regularly check their Laurier email account for important notices from the university community. Students are also expected to send emails to official members of the university community from their Laurier email account in order to ensure delivery. Emails sent from non-Laurier accounts, such as Gmail, might be identified as spam and not delivered, so using these types of accounts is done at your own risk: The instructor will not be responsible for correspondence that is not sent in accordance with the official means described above.