

Department of Computer Science & Information Systems

***CIS-311 Windows Programming with VB.NET***

# **Instructor:** Dr. Scott D. James



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**Office Hours:** MTWR10:30 – 11:30 AM

**Credits:** 4

**Text:** None – There is currently no book in publication that approximates the contents of the course. Hence we will be relying heavily upon the several hundred pages of notes that I have created.

**Prerequisites:** CS 146, CS 216

**Course Purpose:** Writing software applications for the Microsoft Windows platform will be the focus of this course. An examination into the various Graphical User Interface components and Windows Application Programming Interface will be provided using Visual Basic as the language vehicle. In addition topics such as VB classes, ActiveX controls, ADO databases, MDI forms and several other namespaces will be presented.

**Grading Policy:**

# I grade using the following scale:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 87 – 89 B+ | 77 – 79 C+ |  |
| 95 – 100 A | 84 – 86 B | 70 – 76 C |  |
| 90 – 94 A- | 80 – 83 B- | 60 – 69 D |  |

Any grade below 60% results in a failure of the class. I do not round grade percentages…in other words, if you want an A-, you must earn at least 90%; I will not round 89.5 to 90. Remember that grades of a “C” or higher must be earned in classes which serve as prerequisites for other courses.

**Homework Policy:**

Homework consists of any assignments that I require to be turned in. Typical homework assignments consist of programming assignments, flowcharts, reports and so forth. I am also a strong supporter of the University’s Writing Program! Thus anything that you turn in must be professional in appearance and well written. You will be graded on your content and style in addition to the technical aspects of the homework. You are encouraged to use all computer tools available to you such as word processors, spreadsheets, drawing tools and presentation packages in completing assignments.

Homework assignments will always be due at the beginning of class on the due date specified. ***I do not accept late homework!*** 5 minutes late is the same as 5 hours late which is the same as 5 days late…in other words if you want credit, your assignment must be turned in as required by the due date and time – no excuses, no exceptions. I give you enough time such that if you get started early you should be able to turn things in well before the due date and time. Procrastination on your part does not constitute an emergency on my part. If you want partial credit, again whatever you are turning in must be turned in on time. Also, provide some information denoting what you have completed and what does not work.

Any assignments that you created on the CSIS departmental systems must be stored there until the end of the semester. Create a folder for each separate homework assignment. Do not delete any homework assignment folders or their contents until you receive your grade report from SVSU. I may ask questions about your homework assignments anytime during semester. If you are creating homework on other systems, it is your responsibility to back them up and have them available for use at any time during the semester.

**Electronic Submission of Work Policy:**

I will require that you electronically submit your homework to me via the assignment tab in Canvas. If there are multiple files that constitute your solution to an assignment, place them all in a .zip file and upload that single .zip file to Canvas.

I will only accept document-type items prepared with the following tools: Microsoft Word, Microsoft Excel, Microsoft Access, Microsoft PowerPoint, Microsoft Visio and Microsoft Project. The school provides this software in its computer laboratories and it is also made available to you as a student of SVSU & CSIS for your personal computer – I will not spend time converting from various other formats. Graphics may be in the form of .GIF, .JPG or .PNG.

I will only accept email questions sent to my SVSU email account and the questions should be sent from your SVSU student email account! I will not respond to e-mail that doesn't contain: (1) your real name and (2) your SVSU email account. I have had too many students in the past change their free external email accounts several times over one term – I will not be responsible for keeping up with where your new mailbox may be, nor will I waste my time looking up handles like "1CoolDude."

If you are asking for help and there are multiple pieces/files to what you want me to look at, place it in a single zip file. Do realize that the SVSU mail server automatically scans and bans certain file types. For example, if a file (or a .zip archive) contains a .vb Visual Basic code file, that email will not be delivered to me. You can always paste a section of code in your email body and that will make it through fine; attaching a code file may not.

Finally, please do not post multiple copies of your homework – the version you put on Canvas should be the one you want graded. If you do post to Canvas and realize you’ve made an error, you can upload a newer version without needing me to do anything. If you need help on an assignment and you are sending me items to look at via email (again in zip files, please), then make sure that the message subject says something like "I need help on assignment X." Finally, if you want to know if I got a particular piece of e-mail, tag your message with a "read notification" receipt.

These policies are not meant to make your life more difficult; they simply provide a context for us to work in within an electronic environment. Students in the past semesters have gotten quite careless in their handling of electronic homework and this is simply a way to ensure that we have ground rules in how business is to be conducted.

**Materials Policy:**

I post notes, code samples and readings to Canvas. You are responsible for locating, reading and printing these items in a timely manner as necessary. In the effort to become more “green,” I have stopped printing out generic sets of notes since some students liked the notes smaller (3 or 6 slides to a page), while others prefer them to be larger (1 slide per page). As I tend to lecture heavily of these materials, it is your responsibility to download the notes and have them available to annotate as I move through them. I strongly recommend that you print the notes out so that you can add additional comments and drawings to them as we move through the various materials. If you just intend to passively watch the lectures and jot notes down here and there, you will (A) not be able to keep up, and (B) you won’t be able to recall what your notes pertain to. There is a lot of material that we will be covering, and you will find it much easier to have a physical copy of the notes available as we talk about the various topics.

I do not post grades on Canvas because I do not like the gradebook feature it uses at all. It is way too cumbersome for how I teach classes and grade assignments. Instead, you will receive a personalized email from me that provides your current course grade. I send these emails out after I have completed grading each assignment or exam. If you are ever curious as to how you are doing in the class, feel free to ask me and I will be happy to share that information with you.

**Software Tool Availability:**

I try to use software tools that are available to you for free. In some cases, that may include open source tools, to which I will provide you the URL for the tools. The CSIS Department also participates in the Microsoft Imagine program, which means that you can get many Microsoft products free of charge as long as you are a student enrolled in CSIS classes. Visit <https://appsc.svsu.edu/elms/> to see what packages are available to you. There is a tab there specifically for CSIS that says Azure Dev Tools which are the extra software packages available just for CSIS students.

**Exam Policy:**

You are expected to take all examinations on their scheduled dates and times. If there are circumstances that will prevent you from taking the exam on its scheduled date and time, you must let me know in advance. If something occurs and you miss an exam, such as a medical emergency or accident, you must submit in writing why you missed the exam and provide supporting documentation to validate your claim. I will then decide whether a makeup exam will be given.

In general, all tests are closed book, closed notes and closed neighbor! I may allow you to occasionally use a calculator. If a calculator is permitted, it must be a standard calculator (HP, TI, Casio) and not a smartphone/tablet/computer. All materials other than the test document, your writing instruments and the calculator (if allowed) must be stored under your desk. No other items (water bottles, purses, et cetera) are allowed on the desk. You must remove and stow all hats and smartwatches as well. I do not allow you to leave for restroom breaks due to the fact that students have been caught cheating in the past – so take care of business prior to coming to class. If you have a medical condition that warrants you needing to use the restroom, you should contact the Office of Accessibility Resources and Accommodations (ARA) to make arrangements for testing in their area. I also reserve the right to assign seats and arrange the classroom as I see fit on testing days.

**Attendance Policy:**

We are all adults in the class. It is costing someone, probably you, for your enrollment in the class. I assume that you will be in class, however, situations can arise which prevent this from time to time. You are responsible for everything that takes place, is discussed, and announced in lectures and labs. If you miss a class it is your responsibility to get the notes, assignments and so forth. I do not take attendance – I assume that you want to be here and learn. Pop quizzes may be given in class and if you are absent on that particular day, you will not be able to make the quiz up. Pop quizzes are usually given when a significant number (20% or more, but this varies depending on the size of the class) of students are missing. I do not enjoy lecturing to an empty room!

**Students with Disabilities Policy:**

Students with disabilities that may restrict their full participation in course activities are encouraged to meet with me or contact the SVSU Office of Accessibility Resources and Accommodations (ARA) in Wickes 260 for assistance. The website is located at www.svsu.edu/access.

**Ethics Policy:**

Computer Science and Computer Information Systems programs often have a problem with ethics in regard to students doing their own work. On the other hand, "software is not a solo business, so you do not have to work alone." I strongly encourage you to discuss the preliminary analysis of the problem, algorithms, plan of attacks, interpretation of errors at compilation and execution time with each other and me outside of class. You may not share code, flowcharts or other detailed descriptions, however. You should produce your own design, coding, documenting and test plans as required by yourself. Please note that there is a difference between discussing and sharing. Discussing can include topics such as "you need a data structure to store several elements sequentially." Sharing begins when you start specifying implementation details such as "use a linked list." Ultimately your success in industry is going to depend on your own skills, not what you have been able to copy from others.

If I find that you have plagiarized code from other students and/or external sources, forged input and/or output, copied flowcharts, forged or fudged analysis results, cheated on an exam and so forth, I will take action in response. It is my prerogative as to the appropriate punishment, which will range a minimum of getting a zero on the particular item on up to failing the course and receiving an F. It is also within my discretion to report you to the proper University departments (the CSIS department, the SE&T Dean’s Office and the Office of Student Conduct). Please read the "Academic Dishonesty" section of the SVSU Student Handbook carefully. SVSU takes this matter very seriously – there is a website with more information at http://www.svsu.edu/academicintegrity.

**Syllabus Policy:**

The instructor reserves the right to change the syllabus and will give students adequate notice of any changes.

**Electronic Device Policy:**

Any electronic device which is capable of disrupting class or disturbing others should be shut off and stored prior to entering class. Examples of such devices include cellular phones, pagers, MP3 players and other personal electronics. **All personal computing devices (notebooks, tablets, et cetera)** are also banned from class unless I specifically grant permission to use them on an in-class related exercise. Violations of this policy will result in a loss of course points and being asked to leave the classroom.

**Student Research and Creativity Institute:**

Got a great idea and want help taking it to the next level? The SRCI will help support and promote outstanding work in the arts, humanities, sciences, professional disciplines and community service. Students will work with a faculty mentor throughout the process. If you are interested in more information, there is information available at http:/www.svsu.edu/scri.

**Open Door Policy:**

Obviously I have specific office hours available each week. I highly encourage you to drop by and ask any questions that you may have on course material or for clarification on homework that you may be unsure of. Please do not allow yourself to fall behind since it becomes very difficult to catch up at a later date. I am in my office much more often than just for my office hours, and you are welcome to stop by anytime. I am always more than happy to talk about computers/computer science in general, try to provide some technical support help, try to help in course scheduling, or to just listen to issues that you may have in other courses. In addition, I strongly encourage you to provide feedback to me to let me know how the course is running. If you have any suggestions on how the course could be improved, please let me know. I want you to get as much out of the course as possible – after all, your tuition dollar paid for it!

**I reserve the right to make any changes to the course and schedule as the need arises!**

**Course Schedule:**

First Day of Class – January 10th

Dr. Martin Luther King, Jr. Day – January 17th – No Classes

Midterm Exam – Wednesday, February 23rd

Spring Break – March 7th – 13th

Final Exam is on Monday, April 25th from 12:30 p.m. – 2:20 p.m.

**Course Particulars:**

This class is a programming course, thus the majority of your work will involve programming assignments. Your grade will be calculated using the following components: Midterm Examination 20%, Final Examination 20% and Programming Assignments 60%. Your programs must conform to the programming, commenting and flowcharting conventions established in class in order to earn full credit.

**Course Topics:**

# Chapter 1 What is this Thing Called VB?

* The History of Visual Basic?
* Advantages of VB
* Disadvantages of VB
* Understand the concepts of object-oriented and event-driven programming models

# Chapter 2 Review of Visual Basic Essentials

* Review of Visual Basic 146 Concepts
* Setting up Visual Studio for VB
* Debugging Skills
* Understanding File Extensions
* Understanding Namespaces

# Chapter 3 More on Forms Based Applications

* Introducing Form Controls
* Application Startup Control
* Application Termination

# Chapter 4 Language Building Blocks

* Data Type Ranges
* Data Type Declaration Defaults
* Rules for Identifiers
* Special Values in VB
* VB Intrinsic Functions
* More on the Format Function
* Hungarian Notation

# Chapter 5 Common Controls, Properties and Events

* Understanding the common properties available on most controls
* Understanding common events that are generated by controls
* Control Sample Programs
* Introductory Error Handling

# Chapter 6 Language Miscellany and Console Applications

* Visual Basic’s True and False Values
* Miscellaneous Relational Related Operators
* Other Decision Related Constructs
* More on Subprograms Arguments
* Variable Scope (Local vs. Global and Public vs. Private)
* Static Storage
* Subprogram Overloading
* Revisiting Option Explicit
* Building Console Applications

# Chapter 7 – Other Data Types in Visual Basic.NET

* Enumerated Values
* Structure Types and the With Statement
* Strings and String Classes
* Char Class
* Dates
* Regular Expressions
* Random Numbers

# Chapter 8 – Data Containers

* Arrays and Related Functionality
* Collections
* Dictionaries and SortedDictionaries
* Stacks and Queues
* Lists and SortedLists
* LinkedLists
* Sets and SortedSets
* Hashtables
* ArrayLists
* Specialized Data Structures

# Chapter 9 – Generics, Lambda and LINQ

* Generics
* Lambda Expressions
* Anonymous Types
* Language Integrated Query (LINQ)

# Chapter 10 – Working with Files

* Understanding Components and References
* Working with .NET File and Directory Operations
* Working with Sequential Access Files
* Handling Random Access Files
* Serialization
* The FileSystemWatcher Class

# Chapter 11 – Form Development Details

* Forms
* Working With Menus
* Building More Forms
* MDI Forms
* Understanding the OpenForms, MDIChildren and Controls collections

# Chapter 12 – More on Controls

* Using more of the VB controls
* Understanding the common dialog controls
* Creating a splash screen
* Setting control properties

# Chapter 13 – Advanced Form/Control Issues

* Handling events with the mouse
* Changing the shape of the cursor
* Handling events with the keyboard
* Miscellaneous form and control odds and ends
* Creating context menus
* Cloning controls (control arrays)
* Drag and drop
* Making the MessageBox look pretty
* Containers

# Chapter 14 – Error Handling and Exception Handling

* Introduction to Error Handling and Exception Handling
* Unstructured Error Handling
* Modern Hip Exception Handling
* What Exceptions Exist?
* Creating Your Own Exception Handler
* The Using Statement

## Chapter 15 – Working with Databases

* Understand Microsoft’s database models
* Working with databases through the Wizards
* Working with databases through VB Code
* LINQ To SQL
* Review of ADO.NET Related Classes
* Using SQL

# Chapter 16 – Object-Oriented Programming in VB

* Understanding Object-Orientation in VB
* Overview of Classes in VB
* Simple Class Creation
* Inheritance Types
* A Polymorphic Example
* Summary on Basic Object-Orientation
* Firing Events and Exceptions from your Own Class
* Understanding Interfaces
* The DoEvents Statement
* Delegates
* Namespaces

# Chapter 17 – Communicating with Other Applications

* Understanding Microsoft’s Evolving Object Model
* Using Automation
* Using the Shell Command
* Using Sendkeys
* Other Related Commands
* The Environment Class
* The Application Class
* Calling APIs
* The Clipboard

# Chapter 18 – VB and Networking, Part I

* The Web Browser Control
* The WebClient Class
* Sending e-mail Messages
* Miscellaneous Network Classes
* Introduction to ASP.NET Projects

# Chapter 19 – Building your own Controls and DLLs

* Creating a Control
* Creating a .NET DLL
* Creating a Combination DLL

# Chapter 20 – Threading and Networking, Part II

* Understanding Threads
* Handling Threads in VB
* Thread Odds and Ends
* Networking and Threads
* A Simple Chat Program

# Chapter 21 – Graphics and Multimedia

* Understanding the VB Graphics Commands
* Using the PictureBox Control
* Using the Windows Media Player Control
* Using the System.Media Namespace

# Chapter 22 – Printing from within VB

* Using the PrintForm Control
* Using the Print Dialog Controls
* Creating an Application That Prints
* Introduction to the Report Builder

# Chapter 23 – Next Steps in Application Building

* Application Settings and Resources
* The My Namespace
* Working with Internationalization
* Working with Logging
* Introduction to Security in .NET
* Reflection

# Chapter 24 – Working with the IDE

# Task list

# Snippets

# Other Diagramming Techniques

# Software Metrics

# Code Analysis Tool

# Profiling

# Unit Testing and Test Driven Development

# Installation Projects

**Keeping Yourself Out Of Trouble:**

I’ve taught classes long enough to see certain patterns of behavior/actions emerge from students that end up landing them into trouble in my classes. I’d like to share a list of do’s and don’ts to try to help you along:

* Plan on showing up to class each day, on time, refreshed and ready to learn.
* Have the necessary materials for the class printed out and available to use.
* Pay attention (don’t get distracted), ask questions and participate in discussions…you’ll learn more!
* You will not learn through osmosis, no matter how hard you try! You will have to take some effort into looking the materials over and over again, trying to lock the knowledge into your brain.
* When I give you a homework assignment, you should plan on starting it very soon (like that day or the next). Many of my assignments look straightforward but there are often little twists to them that require you to use problem solving skills.
* Learn what tools are available to you and how to use them.
* If you’re unsure about some aspect of an assignment, ask before you waste a bunch of time working on the wrong thing.
* Waiting too late to start a homework assignment is your emergency, not mine. If you wait too long and run into problems, I may not be able to help you enough to get things completed. Remember: if everybody did that, the line outside my office would be a mile long and there is no way I could help everyone.
* Think before you start firing off emails. In the past, I’ve had students email questions about problems they are having. I’d open my email up and see 10 messages, which were all works in progress on the same problem. If the student had spent a bit more time on his/her own **thinking**, they ended up answering 90% of their own questions.
* Many problems cannot be solved/answered via email. You should plan on coming in for help if the problem is very complex.
* Get your homework done early and turned in early. You’ll save everybody involved a whole lot of stress.
* If you are working in teams or partners, be a good team player/partner. Do your fair share. Be accommodating as much as possible to other people’s schedules. Show up to meetings prepared. Nobody wants to have to work with a slacker (including me)…
* Cheating irritates me big time. I busted my butt through all my degrees and I expect no less from you. If I catch you cheating, there are consequences as outlined above. Even if I don’t catch you, taking the easy way out is not preparing you for the working world. Simply put, don’t cheat; you’re a college student, have some integrity for crying out loud!
* Paying for the class does not equal you passing the class. You paid to hear me talk and wave my hands (which I do a lot). Passing is not a privilege, a right or something you are entitled to. If you want a good grade, you must **earn** it.
* CSIS topics are a lot like math in that they are cumulative; you build new material on top of previous concepts. Don’t let yourself get behind. If there is something you don’t understand, come in for another explanation or additional help.
* If you miss a day, it’s your responsibility to find out what took place.