

COURSE NAME: DAT320 Data Manipulation Techniques

Credit Value: 4
Total Course Hours: 56
Prerequisite Course(s): None
Corequisite Course(s): None

COURSE DESCRIPTION

Data manipulation is the process of changing data to make it easier to read and analyze. Large, complex, and diverse data sets require manipulation to parse, split, edit and establish correlations between sets. In this course, students will use Visual Basic for Applications (VBA) to automate the process of preparing and transforming data in support of the data analysis process.

PLAR INFORMATION

This course is eligible for Prior Learning Assessment and Recognition. Students are advised to discuss options with their program coordinator.

COURSE LEARNING OUTCOMES

Upon completion of this course, the student will have reliably demonstrated the ability to:

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| <p>1.0 Compare data manipulation best practices.</p> <ul style="list-style-type: none">1.1 Summarize what it means to structure data into meaningful information to answer business questions.1.2 Recognize common operations used to shape data so that it can display information or to feed and/or train an analytics model.1.3 Identify techniques for checking data.1.4 Identify techniques for testing data. <p>2.0 Demonstrate the role of data manipulation in analytical tasks and process flows.</p> <ul style="list-style-type: none">2.1 Identify the types of preparations and structures required as a precursor to specific analysis.2.2 Screen a dataset for normality and explain how to address outliers.2.3 Check and test the viability of a given dataset based on an analysis plan.2.4 Analyze ways to select, update and delete data depending upon the analytics application environment.2.5 Prepare and structure data for analysis based on a number of use-cases. <p>3.0 Demonstrate knowledge of relational databases using a prevalent database program.</p> <ul style="list-style-type: none">3.1 Explain the requirements for a database to be considered relational'. | <ul style="list-style-type: none">3.2 Identify the components of a relational database.3.3 Create and customize table designs for a given application.3.4 Enter and normalize data in a database program.3.5 Use database software in a data analytics case study.3.6 Move data from a spreadsheet file into a database program and vice versa. <p>4.0 Create a simple Visual Basic for Applications (VBA) procedure that adheres to established best practices.</p> <ul style="list-style-type: none">4.1 List general rules for using a VBA solution as opposed to other Business Intelligence tools.4.2 Explain variables, constants, data types, loop structures, conditional statements, counters, flags, R1C1 cell referencing style and halting procedures for simple VBA macros.4.3 Solve common error types such as compile, run-time and syntax errors.4.4 Perform conditional formatting using VBA.4.5 Discuss ways to troubleshoot and debug code.4.6 Implement error handling in VBA code.4.7 Explain ways to optimize VBA code.4.8 Write simple VBA procedures that include |
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proper comments and remarks.

5.0 Use VBA to automate data set preparation and transformation in support of the data analysis process.

5.1 Use VBA to produce a pivot table.

5.2 Use VBA for data preparations such as range transformations and locating duplicate values in a range.

5.3 Use VBA to create a chart.

5.4 Interpret and edit supplied VBA code from GitHub or other sources to perform required tasks.

5.5 Create a VBA macro or User Defined function that supports a data analysis process.

5.6 Automate a connection to another application using VBA.

GENERAL EDUCATION

This is not a General Education course.

PROGRAM OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved program learning outcomes (PLO):

Enterprise Analysis and Research

1. Identify, collect, organize, manipulate and analyze data to support problem solving, organizational decision-making and opportunity identification.
2. Utilize current technologies to manipulate data sets, correlate information and communicate results in order to support strategic decisions.
6. Apply enterprise intelligence, analytics and big data tools appropriate to organizational problems, data movement, and system workloads to support evidence-based decision-making.

ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved essential employability skills (EES) outcomes:

2. Respond to written, spoken, or visual messages in a manner that ensures effective communication
6. Locate, select, organize, and document information using appropriate technology and information systems.
7. Analyse, evaluate, and apply relevant information from a variety of sources.

EXTERNAL COURSE ACCREDITATIONS AND CONDITIONS

COURSE EVALUATION

30%Tests

30%In-Class Exercises

40%Projects

PROGRAM SPECIFIC GRADING

Per College Grading System

GRADING SYSTEM

A+:	90-100%	B+:	77-79%	C+:	65-69%	D:	50-54%	S - Satisfactory
A:	85-89%	B:	73-76%	C:	60-64%	F:	0-49%	I - Incomplete
A-:	80-84%	B-:	70-72%	D+:	55-59%			F- Repeat Course, included in GPA
								FS- Failure Supplemental
								FR- Repeat course, excluded from GPA

*For a complete chart of grades and descriptions, please see the Grading Policy.

LEARNING RESOURCES

Other Resources:

Excel VBA Notes for Professionals. <https://goalkicker.com/ExcelVBABook/ExcelVBANotesForProfessionals.pdf>

The Excel VBA Notes for Professionals book is compiled from Stack Overflow Documentation; the content is written by the beautiful people at Stack Overflow. Text content is released under Creative Commons BY-SA.

128 pages, published June 2018

Textbook from previous course

Microsoft Excel Data Analysis and Business Modeling. Author: Wayne Winston. 6th Edition. 2019.

ISBN-10: 1509305882

ISBN-13: 978-1509305889

Web-based resources

Resources listed on the course outline support the achievement of learning outcomes, and may be used throughout the course to varying degrees depending on the instructor's teaching methodology and the nature of the resource.

LEARNING ACTIVITIES

Lectures, Lab Exercises, Peer Review, Group Work

DELIVERY MODE

This course may be delivered, in whole or in part, in a number of modalities, including in class, online, hybrid, in a synchronous or asynchronous manner or a combination thereof, as per accreditation and/or regulatory standards where appropriate.

ACADEMIC POLICIES

Canadore College is committed to the highest standards of academic integrity, and expects students to adhere to these standards as part of the learning process in all environments. The College's Academic Integrity policy seeks to ensure that all students understand their rights and responsibilities in upholding academic integrity and that students receive an accurate and fair assessment of their work. Please review the Academic Integrity policy (A-18) and other academic policies found on our website:

<https://www.canadorecollege.ca/about/policies>.

COLLEGE POLICIES

- Protecting human rights in support of a respectful college community

For college policies please see: <http://www.canadorecollege.ca/about-us/college-policies>.

STUDENT SUCCESS SERVICES - Your Success Matters!

Student Success Services provides student-focused services to facilitate students' success in their studies. Staff provide support by reducing and/or removing educational-related barriers through individualized accommodations and supports to students with disabilities.

Please visit our webpage to learn more: <https://www.canadorecollege.ca/support/student-success-services> or look for our events on social media.

To connect with Student Success Services email studentsuccessnow@canadorecollege.ca or call 705.474.7600 ext 5205.

FIRST PEOPLES' CENTRE:

A culturally safe environment offering CONFIDENTIAL student focused services, drop in or make an appointment to access:

- One on one counselling
- Elder in residence program
- Peer tutoring
- Peer mentorship
- Lunch & learn workshops on study skills, self-care, life skills
- Learning Resource Centre

Drop by our offices at C254 College Drive, E101 Commerce Court or call 705 474 7600 Ext. 5961 College Drive / 5647 Commerce Court.

<https://www.canadorecollege.ca/experience/indigenous-student-experience>

WAIVER OF RESPONSIBILITY

Every attempt is made to ensure the accuracy of this information as of the date of publication. The college reserves the right to modify, change, add, or delete content.

HISTORICAL COURSE OUTLINES

Students use course outlines to support their learning. Students are responsible for retaining course outlines for future use in applications for transfer of credit to other educational institutions.