

MONTGOMERY COLLEGE

Course Syllabus

Mathematics, Statistics, and Data Science Department

I. Contact Information

Professor: Zhou (Jojo) Dong

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Phone: (240) 567-7810

Office: HT 134 Germantown campus

Office Hours:

Monday 10:30 am – 12:30 pm	Drop-in or appointments
Wednesday 10:30 am – 12:30 pm	Drop-in or appointments
Friday 10:30 am – 12:30 pm	By appointment only

[Click here to book an appointment](#)

II. General Course Information

CMSC/MATH 207 - Introduction to Discrete Structures (Formerly CS256)

4 Semester Hours

An introduction to discrete structures as they relate to computer science. The course will stress computer science applications and will include relations, functions and algorithms, Naive Set Theory, combinatorics, logic, and mathematical induction.

PREREQUISITE:

ENGL101/ENGL101A or appropriate score on English assessment test, and MATH 182.

Spring 2024: CMSC207 CRN 31948 / MATH207 CRN 31947

Class Times: MW 1:00 pm – 2:40 pm

Classroom: HT 139

III. Common Course Student Learning Outcomes

Upon course completion, a student will be able to:

- Apply the mathematical concepts studied to specific problems.
- Demonstrate various proof techniques.
- Apply logic skills to specific arguments.

IV. Textbooks, Workbooks, and Supplies

Required materials for the course:

- *Discrete Mathematics with Applications* (5th edition), by Susanna Epp, Cengage Learning, 2019. (The ebook is available with WebAssign).

- *WebAssign Access Code* – for access to online homework and the ebook Class Key to enroll on WebAssign: **montgomerycollege 7778 2729**
Link: <https://www.getenrolled.com/?courseKey=montgomerycollege77782729>
- *Microsoft Teams and OneNote* – for course meetings, announcements and communication. MC students can download these programs for free from their [Microsoft 365 account accessed through MyMC](#).
Class Microsoft Team: [CMSC/MATH 207 Spring 2024](#)
- *Basic Calculator* – While a calculator is not required for the course, you are allowed to use a basic four-function calculator on tests. No graphing or scientific calculators are allowed.

V. Course Design

This course is designed to give the student a high degree of autonomy and students are expected to self-direct their learning. While reading quizzes and online homework problem sets based on the course textbook are provided and automatically graded, these grades are replaced by exam scores should the exam scores be higher. This means it is possible for a student's final course grade to be based solely on their exam scores. Thus, it is up to the student to determine which resources they will use to learn and study from to best prepare for the exams.

A. Bloom's Taxonomy

This class has been designed based on Bloom's Taxonomy. A basic understanding of Bloom's Taxonomy will help the student understand the course design and to better succeed in this class.

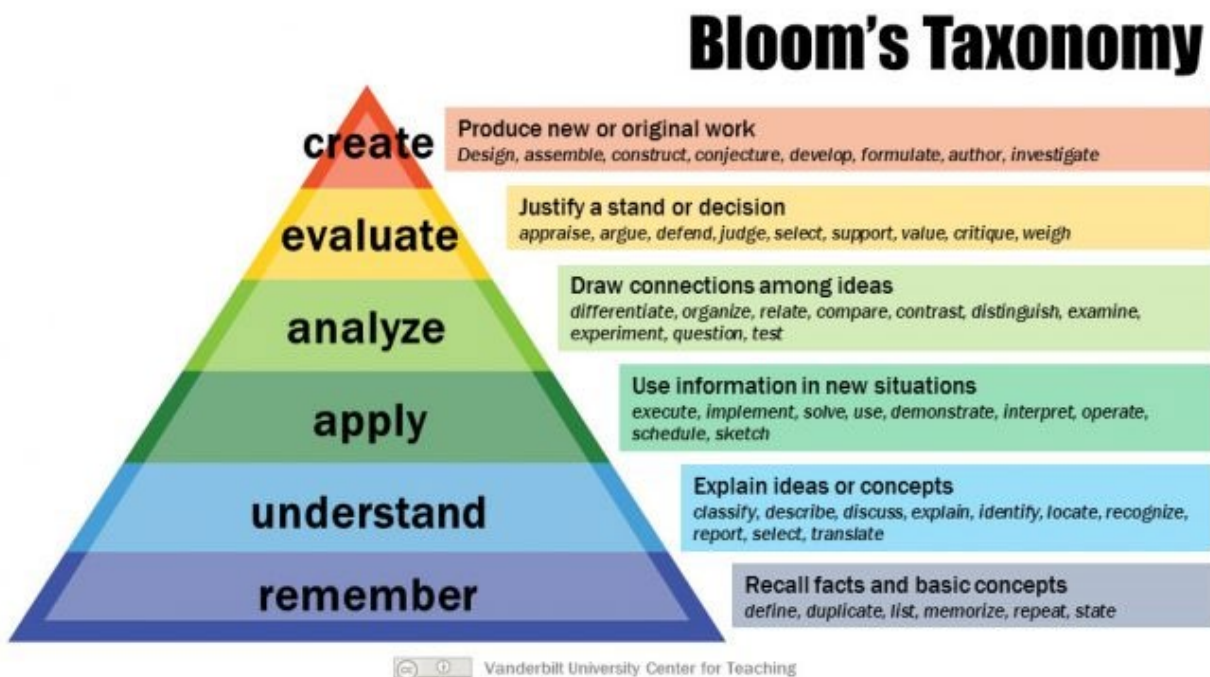


Figure 1 - Bloom's Taxonomy, from <https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/>

B. Flipped Classroom Instruction

The Flipped Classroom

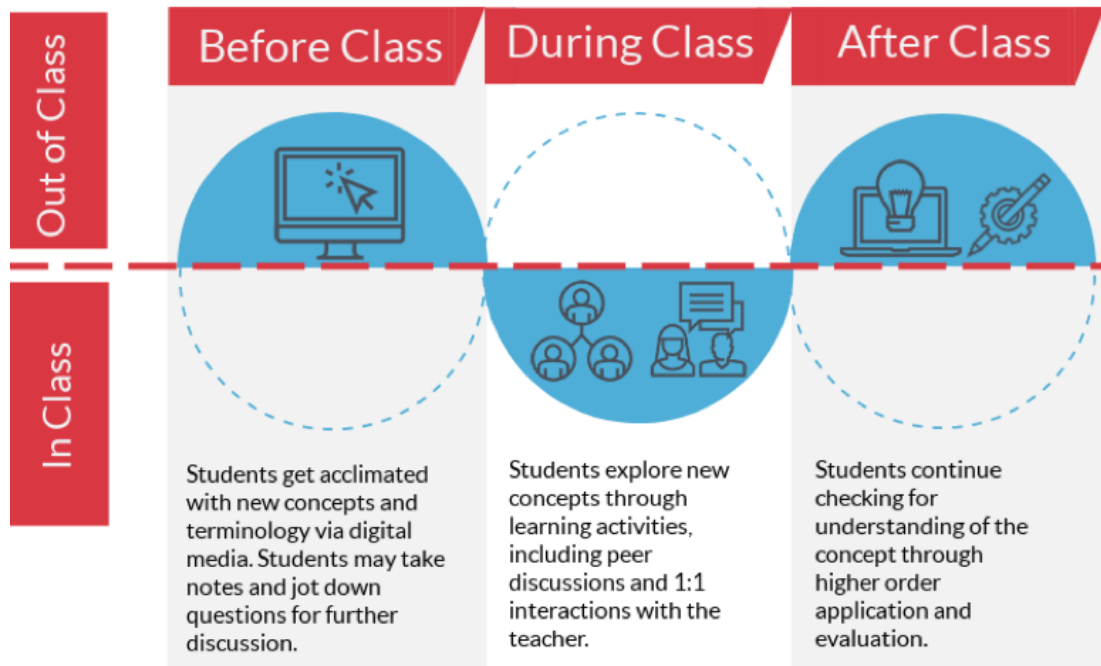


Figure 2 - The Flipped Classroom, from <https://www.odysseyware.com/blog/using-classpace-flipped-classroom>

In the flipped classroom model, students begin learning the course material at home before class, while class time is focused on solidifying understanding through active discussion and problems solving. While preparing for class, the focus at this time should be on the *Remember* and *Understand* levels of Bloom's Taxonomy:

- Memorize definitions and theorems
- Paraphrase definitions and theorems
- Understand worked examples

During class, students work with each other and the instructor to develop the *Apply*, *Analyze*, and *Evaluate* levels of Bloom's Taxonomy. Occasionally, students are expected to reach the *Create* level of Bloom's Taxonomy. After class, students should focus on consolidating their learning through additional practice and self-assessment to prepare for exams.

Student Activities Before class:

- Read textbook or lecture slides, or watch lecture videos
- Complete the reading quizzes to self-assess the remember and understanding levels of Bloom's taxonomy
- Prepare questions for class discussion

Student Activities During class:

- Participate in class discussion facilitated by the instructor
- Work in groups or individually on in-class assignments to reach and apply and analyze levels of Bloom's taxonomy

Student Activities After class:

- Review and prepare for exams

- Complete Practice Problem Assignments on WebAssign
- Attend instructor office hours
- Utilize MAPEL Center tutoring

Bloom's Taxonomy in a Flipped Classroom

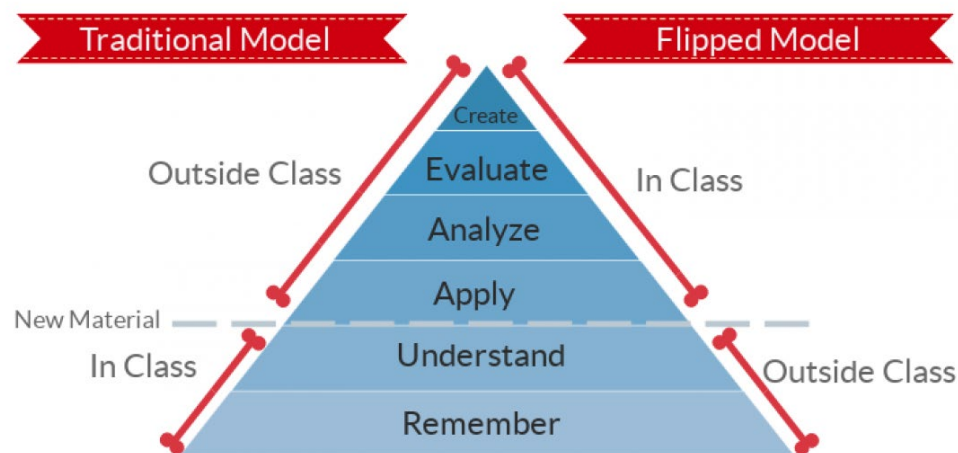


Figure 3- Bloom's Taxonomy in a Flipped Classroom, from <https://www.odysseyware.com/blog/using-classpace-flipped-classroom>

It is essential that students put in the time and effort necessary in and out of class. It is generally recommended that for each hour of in-class time, the student spends 2-3 hours out of class studying. This class meets for 4 hours each week, therefore, **students should expect to spend 8 – 12 hours outside class time studying for this class.**

VI. Course Requirements

A. Exams

This course will have three unit exams and a final exam:

Exam	Date	Material covered
Exam 1	Monday 2/19	Chapter 1, 10, 2, 3
Exam 2	Monday 4/1	Chapter 4, 5, 6
Exam 3	Monday 4/29	Chapter 7, 8, 9
Final Exam	Wednesday 5/8 12:30 pm – 2:30 pm	Cumulative

Unit exams each count for 15% of the final course grade. The Final Exam counts for 25% of the final course grade.

B. Reading Quizzes

Students are expected to read the corresponding sections of the textbook prior to each class meeting. Upon completion of the reading, students must take a reading quiz. All reading quizzes are open-book but students must complete the quizzes individually –

no collaboration is allowed. Any quiz with a percentage grade lower than the corresponding exam will be excused. When a quiz is excused for a student, it is not factored into the student's class grade in any way. It is as if the student was never scheduled to take that quiz. Note: this means that a student's quiz average will always be at least as high as their corresponding exam score for that unit.

Unit Exam	Reading Quizzes that may be excused
Exam 1	Chapter 1, 10, 2, 3
Exam 2	Chapter 4, 5, 6
Exam 3	Chapter 7, 8, 9

Quizzes count for 15% of the final course grade.

C. Homework

Practice Problem assignments corresponding to each Unit Exam are available on WebAssign and due on the day of the Exam. Any WebAssign Practice Problem assignment with a percentage grade lower than the corresponding exam will be excused. When an assignment is excused for a student, it is not factored into the student's class grade in any way. It is as if the student was never scheduled to take that assignment. Note: this means that a student's homework average will always be at least as high as their corresponding exam score for that unit.

Unit Exam	Homework assignments that may be excused
Exam 1	Chapter 1, 10, 2, 3
Exam 2	Chapter 4, 5, 6
Exam 3	Chapter 7, 8, 9

Homework assignments count for 15% of the final course grade.

D. Course Grade

The final course grade will be calculated as follows:

Category	Weight
Homework	15%
Quizzes	15%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Final Exam	25%
Total	100%

Final Grading Scale	
Overall Percentage	Final Grade
90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
< 60%	F

E. Late and/or Make-up Policy for Coursework

It is expected that students will complete reading quizzes and Practice Problems on WebAssign by the posted due date. No late quizzes or homework will be accepted. Students are expected to take exams on scheduled dates. Once an exam has been given, its contents are assumed to be public knowledge. There are NO make-ups for exams. If you miss an exam, the 0% score will be replaced by your final exam score. If you do not miss any exams, your lowest exam score will be replaced by your final exam score if your final exam score is higher. No exam scores are dropped.

VII. Student Code of Conduct

A. Standards of College Behavior

Students are expected to adhere to the [Montgomery College Student Code of Conduct](https://www.montgomerycollege.edu/_documents/policies-and-procedures/42001-student-code-of-conduct.pdf) (https://www.montgomerycollege.edu/_documents/policies-and-procedures/42001-student-code-of-conduct.pdf).

B. Academic Honesty

All exams in this class are closed notes, closed book, and individual. Students should not be collaborating on any exams and any attempts to submit work that is not the student's own constitute breaches of academic honesty and will result in appropriate sanctions. Students should refer to Section VIII Academic Dishonesty of the [Student Code of Conduct](#) or the following excerpt for more details: https://www.montgomerycollege.edu/_documents/academics/support/learning-centers/writing-reading-learning-ctr-germantown/academic-dishonesty-and-how-it-is-handled.pdf

VIII. Collegewide Policies and Procedures

A. Attendance Policy

Students are expected to attend all class sessions. In cases involving excessive absences from class, the instructor may drop the student from the class. An excessive absence is defined as one more absence than the number of classes per week during a fall or spring semester; the number of absences is prorated for accelerated sessions.

B. Withdrawal and Refund Dates

It is the student's responsibility to drop a course. Non-attendance of classes or failure to pay does not constitute official withdrawal.

- Refund Drop Deadline – January 28, 2024
- No Grade Drop & Audit/Credit Deadline – February 11, 2024
- W Grade Drop Deadline – April 14, 2024

C. Audit Policy

All students registered for audit are required to consult with the instructor before or during the first class session in which they are in audit status, and students are required to participate in all course activities unless otherwise agreed upon by the student and instructor at the time of consultation. Failure to consult with the instructor or to so participate may result in the grade of "W" being awarded. This action may be taken by the instructor by changing the "AU" to "W" before the drop with "W" date.

D. Disability Support Services

Your success in this class is important to me. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. If you have a disability that may impact your access and learning in this course, please contact me to discuss your specific needs. An accommodation letter from [Disability Support Services \(DSS\)](#) (<http://www.montgomerycollege.edu/dss>) authorizing your

accommodations will be needed. Please note that accommodations needed for an online course may be different from those needed in a traditional classroom setting, so it is important to work with DSS to determine appropriate accommodations for this course as early as possible. Since accommodations are not retroactive, it is strongly recommended that you notify me as early as possible in the term.

E. Veteran's Services

If you are a veteran or on active or reserve status and you are interested in information regarding opportunities, programs and/or services, please visit the [Combat2College website](http://www.montgomerycollege.edu/combat2college) (<http://www.montgomerycollege.edu/combat2college>).

F. Delayed Opening or Closing of the College

Montgomery College will always operate on its regular schedule unless otherwise announced. Depending on the nature of the incident, notifications of emergencies and changes to the College's operational status will be communicated through one or more of the following means:

- College emergency responders: Security Officers, Campus Response and/or Support Teams
- [Montgomery College ALERT](https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html) (<https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html>). Registered users receive text and e-mail messages
- Montgomery College Emergency Desktop Notification. Scrolling messages are broadcast on College computers
- [Montgomery College website](http://www.montgomerycollege.edu/) (<http://www.montgomerycollege.edu/>)
- [MyMC website](http://mymc.montgomerycollege.edu/) (<http://mymc.montgomerycollege.edu/>)
- Montgomery College [student e-mail system](http://portal.office.com/) (<http://portal.office.com/>)
- Montgomery College employee voice mail. From off-site, dial 240-567-1701
- Montgomery College [employee e-mail](http://mail.montgomerycollege.edu/) (<http://mail.montgomerycollege.edu/>)
- Montgomery College main phone number at 240-567-5000
- Montgomery College cable channel 10 in Montgomery County
- Commercial radio and TV stations including:

Television	Radio
Channel 4 WRC	WTOP (103.5 FM)
Channel 5 WTTG	WFRE (99.5 FM) - Frederick
Channel 7 WJLA	WAMU (88.5 FM)
Channel 9 WUSA	WFMD (930 AM) - Frederick
News Channel 8	WMAL (630 AM)

All inquiries from the news media regarding an emergency event should be directed to the College's Office of Communications.

How Closing and Delays Impact Classes

If a class can meet for 50% or more of its regularly scheduled meeting time OR if the class can meet for 50 minutes or more, it will meet. Montgomery College will always operate on its regular schedule unless otherwise announced. Depending on the nature of the incident, notifications of emergencies and changes to the College's operational status will be communicated through one or more communication methods including the

College's website (<http://www.montgomerycollege.edu>). For the most up-to-date information regarding College openings, closings, or emergencies, all students, faculty, and staff are encouraged to sign up for email and text alerts via Montgomery College ALERT (<https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html>). For registration information, please visit the Montgomery College Public Safety website (<http://www.montgomerycollege.edu/emergency>).

G. Communication

This course will use your official Montgomery College email address, Microsoft Teams, and Microsoft OneNote for communication. It is recommended that you check your account routinely for official communication or as directed by your instructor(s). Some items you may find there are: course announcements, invoices, important admission/registration information, waitlist status. To check your e-mail, log into your MyMC account and locate the e-mail icon in the upper right hand corner of the page.

This course will NOT use Blackboard for communication.

H. Sexual Misconduct

Montgomery College's Sexual Misconduct Policy & Procedure (31001-CP) (<https://www.montgomerycollege.edu/documents/policies-and-procedures/31001-sexual-misconduct.pdf>) and Federal Title IX law prohibit discrimination and harassment on the basis of sex in College programs and activities. Any student who is impacted by sexual harassment, sexual assault, dating and domestic violence, stalking, gender discrimination, pregnancy discrimination, gender-based harassment or retaliation should contact the College's Title IX Coordinator to make a report and/or access supportive measures and resources. For more detailed information about the College's response to sexual misconduct or to make a formal complaint visit the College's Title IX webpage (<https://www.montgomerycollege.edu/policies-and-procedures/title-ix/>).

I. Pregnancy

Title IX prohibits discrimination on the basis of sex, including pregnancy and related conditions. The College must give all students who might be, are, or have been pregnant the same access to school programs and educational opportunities as other students. For guidance and obligations related to academic adjustments, accommodations, and support, please see the College's Title IX webpage (<https://www.montgomerycollege.edu/policies-and-procedures/title-ix/>).

IX. Honors Module

This class has an attached honors module for eligible students in addition to the above requirements. Enrollment is limited and students must meet Honors Program eligibility standards. If you are interested in taking this as an honors class, you must meet with the instructor during the first two weeks of classes.

A. Eligibility

- Completion of at least 12 Montgomery College credits
- Cumulative 3.4 grade point average or higher
- Grade of A or B in ENGL 101

Alternative criteria can be evaluated by the Honors Program Chair or a STEM Scholars Program coordinator. Contact the instructor for more information.

X. Course Schedule

Week	Date	Topic
1	Mon 1/22	Chapter 1: Speaking Mathematically 1.1: Variables 1.2: The Language of Sets 1.3: The Language of Relations and Functions
	Wed 1/24	1.4: The Language of Graphs 4.9: Application: The Handshake Theorem
2	Mon 1/29	Chapter 10: Theory of Graphs and Trees 10.1: Trails, Paths, and Circuits 10.4: Trees: Examples and Basic Properties
	Wed 1/31	10.5: Rooted Trees 10.6: Spanning Trees and a Shortest Path Algorithm
3	Mon 2/05	Chapter 2: The Logic of Compound Statements 2.1: Logical Form and Logical Equivalence 2.2: Conditional Statements
	Wed 2/07	2.3: Valid and Invalid Arguments 2.4: Application: Digital Logic Circuits 2.5: Application: Number Systems and Circuits for Addition
4	Mon 2/12	Chapter 3: The Logic of Quantified Statements 3.1: Predicates and Quantified Statements I 3.2: Predicates and Quantified Statements II
	Wed 2/14	3.3: Statements with Multiple Quantifiers 3.4: Arguments with Quantified Statements
5	Mon 2/19	Exam 1 (Ch. 1, 2, 3, 10)
	Wed 2/21	Chapter 4: Elementary Number Theory and Methods of Proof 4.1: Direct Proof and Counterexample I: Introduction 4.2: Direct Proof and Counterexample II: Writing Advice 4.3: Direct Proof and Counterexample III: Rational Numbers 4.4: Direct Proof and Counterexample IV: Divisibility
6	Mon 2/26	4.5: Direct Proof and Counterexample V: Division into Cases and the Quotient-Remainder Theorem 4.6: Direct Proof and Counterexample VI: Floor and Ceiling
	Wed 2/28	4.7: Indirect Argument: Contradiction and Contraposition 4.8: Indirect Argument: Two Famous Theorems 4.10: Application: Algorithms

7	Mon 3/04	Chapter 5: Sequences, Mathematical Induction, and Recursion 5.1: Sequences
	Wed 3/06	5.2: Mathematical Induction I: Proving Formulas 5.3: Mathematical Induction II: Applications
8	<i>Spring Break</i>	
9	Mon 3/18	5.4: Strong Mathematical Induction and the Well-Ordering Principle for the Integers 5.6: Defining Sequences Recursively
	Wed 3/20	5.7: Solving Recurrence Relations by Iteration 5.8: Second-Order Linear Homogeneous Recurrence Relations with Constant Coefficients 5.9: General Recursive Definitions and Structural Induction
10	Mon 3/25	Chapter 6: Set Theory 6.1: Set Theory: Definitions and the Element Method of Proof 6.2: Properties of Sets
	Wed 3/27	6.3: Disproofs and Algebraic Proofs 6.4: Boolean Algebras, Russell's Paradox, and the Halting Problem
11	Mon 4/01	Exam 2 (Ch. 4, 5, 6)
	Wed 4/03	Chapter 7: Properties of Functions 7.1: Functions Defined on General Sets 7.2: One-to-One, Onto, and Inverse Functions
12	Mon 4/08	7.3: Composition of Functions 7.4: Cardinality with Applications to Computability
	Wed 4/10	Chapter 8: Properties of Relations 8.1: Relations on Sets 8.2: Reflexivity, Symmetry, and Transitivity
13	Mon 4/15	8.3: Equivalence Relations 8.4: Modular Arithmetic with Applications to Cryptography 8.5: Partial Order Relations
	Wed 4/17	Chapter 9: Counting and Probability 9.1: Introduction 9.2: Possibility Trees and the Multiplication Rule
14	Mon 4/22	9.3: Counting Elements of Disjoint Sets: The Addition Rule 9.4: The Pigeonhole Principle
	Wed 4/24	9.5: Counting Subsets of a Set: Combinations 9.6: r-Combinations with Repetition Allowed
15	Mon 4/29	Exam 3 (Ch. 7, 8, 9)

	Wed 5/01	Final Exam Review
	Wed 5/08	Final Exam (12:30 pm - 2:30 pm)

The professor reserves the right to make changes to this syllabus.

Last Updated July 29, 2024