

## Math 104: The Power of Mathematics

### Instructor Information

Professor: Dr. Ryan Blair  
Office: FO3-213  
Email: ryan.blair@csulb.edu

### Office Hours

Tuesdays 2:00 – 3:00 pm; Wednesdays 3:00 – 4:00 pm; or by appointment. Any office hour may be canceled due to illness or necessary appointments. You should not depend upon a faculty member being in his/her office for any particular office hour. You should consequently secure any necessary signatures or other such requirements well in advance of any deadline.

### Course Information

Type/Sec #	Course Code	Day & Time	Location	Instructor
Lec 25E	10521	Tu/Th 3:30 – 4:20 pm	CBA-140A	Blair
Act 27E2	10523	F 10:00 – 11:50 am	LA5-149	TA
Act 28E3	10524	Tu 10:00 – 11:50 am	LA5-265	TA
Act 29E4	10525	Tu 12:00 – 1:50 pm	LA1-151	TA
Act 30E5	10526	Th 12:00 – 1:50 pm	PH1-218	Blair
Act 67E6	11537	F 12:00 – 1:50 pm	LA5-149	TA

### Tutoring Hours at Learning Assistance Center (Horn Center 104)

	Monday	Tuesday	Wednesday	Thursday	Friday
9 – 10 am	Srey Sea			Bao Vu	Debbie Tonne
10 – 11 am		Srey Sea		Bao Vu	Debbie Tonne
11 – 12 pm	Srey Sea	Srey Sea			
12 – 1 pm	Srey Sea		Bao Vu		
1 – 2 pm	Srey Sea		Bao Vu		
2 – 3 pm			Bao Vu	Bao Vu	
3 – 4 pm	Debbie Tonne	Debbie Tonne			
4 – 5 pm	Debbie Tonne	Debbie Tonne			

### Prerequisite

Appropriate CSU Multiple Measures Placement or concurrent enrollment in MATH 94.

### Materials

- Papers and pencil.
- A calculator with exp and log.
- iClickers: iClickers are available for purchase or rent at the CSULB bookstore, or online (Amazon, Target, Barnes & Noble, etc.). The following models will work for our class:

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iClicker 2, iClicker 1, iClicker+. You need to have an iClicker remote ready **by the first day of classes**. A used one is fine.

- No required text. All course materials will be posted on *Beachboard*.

## References

- Ethan Bolker and Maura Mast. (2016). Common Sense Mathematics. The Mathematical Association of America. Print ISBN: 978-1-93951-210-9. Electronic ISBN: 978-1-61444-621-7.
- COMAP (2016). For All Practical Purposes. ISBN-10: 1-4641-2483-3.
- Additional materials are available on the course BeachBoard.

## Catalog Description

Topics that demonstrate the power and art of mathematical thinking. Development of quantitative and financial literacy; number sense and computational skills; mathematical habits of mind; communication skills across various mathematical forms; and ability to analyze realistic problems with mathematical tools.

## Course Information

This course is organized around five modules; each consists of a few topics:

Module 1: the power of **M**athematizing

- (M1) Operations
- (M2) Generalized arithmetic
- (M3) Fractions
- (M4) Visual patterns

Module 2: the power of **V**isualization

- (V1) Dimension
- (V2) Projection
- (V3) Flatland
- (V4) Measurements: area and volume

Module 3: the power of **P**roportional thinking

- (P1) Proportional thinking
- (P2) Absolute and relative change, percentage
- (P3) Inflation
- (P4) Weighted average

Module 4: the **D**ecision-Making power of mathematics

- (D1) Probability
- (D2) Simulation
- (D3) Mean, median, variability
- (D4) Saving
- (D5) Borrowing

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## Module 5: the Societal power of mathematics

- (S1, S2) Voting theory
- (S3, S4) Gerrymandering

### Expected Student Learning Outcomes

You will explore the power of mathematizing by developing your mathematical literacy and learning to use mathematics to model real-world and geometric phenomena. You will use the power of visualization to investigate the notions of projection and dimension, learn about mathematics in art and use mathematics to explore higher dimensions. You will learn how to make decisions by analyzing mathematical models related to saving and borrowing strategies, and paying for college. You will also learn about the impact mathematics can have on society through the study of voting theory, Gerrymandering, and fake news. You will experience a growth in your mathematical maturity at end of this course through structured activities. More generally, you will

1. communicate mathematical information symbolically, visually, numerically, and verbally;
2. apply mathematical techniques, statistical techniques, and logical reasoning to produce predictions, identify optima, and make decisions based on a given set of data or quantitative information;
3. employ proportional thinking and repeated reasoning to make sense of structure and generalize;
4. use the language of mathematics to describe and explore patterns, including visual patterns;
5. use mathematical techniques to analyze and explore voting methods and voter representation; and
6. appreciate that mathematics is a creative and useful enterprise in which you can feel confident and successful.

### Classroom Decorum

Laptops and cell phones may only be used in class for course relevant activities (i.e., taking notes, viewing course materials, responding to instructor-led questions). It is important that you refrain from excessive talking during lecture as a courtesy to your fellow students.

### **Activity Attendance (10% of your course grade)**

Given the nature of the course, class attendance is not only required but a major part of your overall course grade. There are a total of 14 (Monday, Tuesday, Thursday, or Friday Activity) or 15 (Wednesday Activity) possible classes throughout the semester. You earn a point if you attend a class for the entire period AND actively engaged with the materials and conversations,  $\frac{1}{2}$  point if you attend and engaged half of a class, and so on. That is, your attendance and participation point is proportional to the amount of time you are actively engaged in class.

If you know you have to miss a day ahead of the time for a reason which is **documented** and **excused** (as defined in the CSULB Catalog), let me know at your earliest convenience so I

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can arrange for you to make up the work. It is your responsibility to keep informed of any announcements, syllabus adjustments, or policy changes made during scheduled classes.

### **Lecture Participation (10% of your course grade)**

You will use your iClicker remote to respond to multiple choice questions during lecture. These questions are meant to check your understanding as you learn new concepts and serve as a tool for me to adjust the pace of the lecture – add more discussions or provide more clarifications if a majority of the students have misconceptions. You will receive the day's participation point for answering 75% of the iClicker questions in that class. Credit for iClickers cannot be made up.

### **Homework (20% of your course grade)**

Weekly homework will be given in the activity class and collected in the subsequent activity class. Homework problems are based on content that is introduced in the large lectures during the previous week. These homework assignments will be a key component of this class since they will give you an opportunity to engage with the material at a deep level. It is your responsibility to seek help for problems which you don't understand; e.g., come to office hours, discuss with classmates, ask in the activity class, or visit the [Learning Assistance Center](#) (Horn Center – 103) for free tutoring. Late homework will not be accepted.

### **Midterm Exams (each worth 15% of your course grade)**

There are three in-class exams assessing your (independent) knowledge on various mathematical structures we investigate in class. Please make a note of the following tentative dates:

Exam 1: Tuesday, October 2, 2018

Exam 2: Tuesday, November 6, 2018

Exam 3: Tuesday, December 4, 2018

### **Final Exam (15% of your course grade)**

The final exam will be cumulative (covers all material) and takes place on Thursday **December 18** from **2:45 pm to 4:45 pm**.

### **Evaluation of Learning**

Your final grades will be based upon the **weighted average (WA)** of the above assignments and will roughly follow the conventional grading scheme:

$WA \geq 90\% \rightarrow A$

$80\% \leq WA < 90\% \rightarrow B$

$70\% \leq WA < 80\% \rightarrow C$

$60\% \leq WA < 70\% \rightarrow D$

$WA < 60\% \rightarrow F$

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## Academic Honesty

Cheating and plagiarism are serious academic crimes. Work that you submit (whether handing in a hard-copy, submitting electronically, doing a presentation or using some other form of submission) is assumed to be original unless your source material is documented appropriately.

## Accommodation

Students with a disability or medical restriction who are requesting a classroom accommodation should contact the Disabled Student Services (DSS) at 562-985-5401 or visit Brotman Hall, Suite 270 during 8 am – 5 pm weekday hours. DSS will work with the student to identify a reasonable accommodation in partnership with appropriate academic offices and medical providers. Please notify me at your earliest convenience if you need special accommodations due to a University verified disability. Information regarding DSS can be found at [Disabled Student Services Website](#).

## Withdrawal

It is your responsibility to withdraw officially from classes. Instructors have no obligation to withdraw students who do not attend courses, and may choose not to do so. Consult the CSULB Enrollment Services website for registration information:

<http://www.csulb.edu/enrollment-services/key-dates-and-deadlines>

## Setting the Norms

The College of Natural Sciences and Mathematics (CNSM) is committed to providing a safe and positive learning environment and has established a zero-tolerance policy for any sexual/gender-based misconduct, including, but not limited to sexual harassment, assault, relationship violence or stalking for all faculty, staff, and students. The following entities at CSULB have been established to provide support and assistance for victims of sexual harassment and assault: Title IX

Office [http://web.csulb.edu/divisions/students/titleix/titleix\\_reporting.html](http://web.csulb.edu/divisions/students/titleix/titleix_reporting.html), CSULB University Police Department <https://www.csulb.edu/university-police/title-ix>, The Women's & Gender Equity Center, [http://web.csulb.edu/divisions/students/wrc/sexual\\_assault/](http://web.csulb.edu/divisions/students/wrc/sexual_assault/), and the Counseling & Psychological Services (CAPS) Office <http://web.csulb.edu/divisions/students/caps/>, and Student Health Services: [http://web.csulb.edu/divisions/students/shs/sexual\\_assault.htm](http://web.csulb.edu/divisions/students/shs/sexual_assault.htm). For more information regarding CSULB's policies on sexual misconduct and discrimination: <http://www.csulb.edu/titleix>.

As members of The Beach community, we practice tolerance and denounce hate and prejudice. Our classroom will strive to be a place of mutual respect where the focus is on learning and student success.

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