Chem 232, Organic Chemistry
Fall 2016

Instructor: Dr. B. Mikael Bergdahl (bbergdahl@mail.sdsu.edu)
Office: **GMCS 213G**
Phone: (619) 594-5865 (office)
Lecture meetings: MWF: 10:00-10:50, **SHW 012**
Office Hours: MW: 11:00 - 12:00 and by appointment

Texts: (a) Solomons & Fryhle & Snyder*, Organic Chemistry*, 12th Ed., Wiley Publ. 2016 ISBN: 978-1-118-87576-6. (**Required**)
(b) Solomons, Fryhle, Snyder, *Study Guide and Solutions Manual* Organic Chemistry 12th Ed. ISBN: 978-1-119-07732-9. (**Required**)
(c) WileyPlus on-line organic chemistry problem (**Optional**). Bundle with the text is an option.
CourseKey: See Instructions in the back of the syllabus. (**Required**)
Lab: (a) R. Somanathan *et al*., *Chem 232 Lab Supplemental Material*.
(b) Pavia *et al. Laboratory text*. Available in laboratory.
Tool: A set of molecular models, such as Prentice-Hall Molecular models, (**Optional**).
E-HW: None

Expected Student Learning Outcomes (Chemistry 232 objectives)**:**

a) To be able to understanding physical properties of organic substances and fundamental chemical reactions in organic chemistry.

b) To be able to determine bonds and hybridizations, Lewis structures, dynamics and stereochemistry of simple organic molecules.

c) To be able to depict chemical mechanisms for rudimentary organic reactions using the curved arrow formalism.

d) To be able to determine and differentiate various types of simple organic reactions: S_N1, S_N2, E1 and E2 pathways.

e) To be able to understand the relationship between different functional groups and organic chemical reactions.

f) To be able to see a connection and similarity between organic chemistry and the application on common “daily life” biochemical processes.

g) To be able to apply and use the outcomes above and apply those in upper division organic chemistry (Chem 432), biochemistry, and more advanced organic chemistry and synthesis.

Prerequisite: A grade of “C” or better from Chem 201 or corresponding chemistry course.
Adding Procedures: Schedule numbers will be provided the first week of class. Students can enroll or add from the waitlist only if space is available the first week of class.
Dropping Procedure: None

Course Structure and Conduct: The lecture course consists of three 50 min face-to-face lectures per week. Lectures will be focused on the theoretical basis and understanding of important concepts of organic chemistry. You will not be penalized for not attending lectures directly, but please be aware that there is a *correlation between attendance and lower course grades in organic chemistry*.

Student disabilities: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot

provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services. Your cooperation is appreciated.

Course Assessment and Grading: Three midterm exams will be given on Saturdays outside the regular lecture schedule (**Sep 24, Oct 22 and Nov 19**) from 10:00 – Noon. *Make sure you can take the exams on these dates before enrolling this class*!! The final exam will be given on **Saturday, Dec 17th** from 09:30 – 11:30 am. No make up exams will be given. Excused absences, substantiated by an appropriate written and *signed confirmation*, will result in no penalty. Unexcused absences will result in a "zero" and will account for an "F" grade for such exam. Your TA along with the instructor will grade your midterms and final exam. ***Your course grade will be assigned at the end of the semester and will be based on a curve using a +/- assignment***. (Letter grades will be assigned for each individual exam – the +/- assignment will not be used for specific exams. There are no pre-determined guidelines for the grade distribution. Most students earn a C, but in fact, it is not too difficult to earn a higher grade in organic chemistry. The cut-off for specific grades varies, but in general an "A" accounts for >85%, a "B" >70% and a "C" around 50%. Exam Scores will be posted on Black Board.

Course website: http://www.chemistry.sdsu.edu/courses/CHEM232/

Electronic Homework: None

Grading: Your course grade will be based on 600 points maximum.

Summary:	Midterm 1	100	points
	Midterm 2	100	
	Midterm 3	100	
	Final Exam	200	
	CourseKey	100	
	Total	600	points

Academic Honesty: The University adheres to a strict policy regarding cheating and plagiarism. These activities will not be tolerated in this class. Become familiar with the policy (http://www.sa.sdsu.edu/srr/conduct1.html).
Any cheating or plagiarism will result in failing this class and a disciplinary review by Student Affairs.
Examples of Plagiarism include but are not limited to:

- Using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work)
- Copying and pasting work from an online or offline source directly and calling it your own
- Using information you find from an online or offline source without giving the author credit
- Replacing words or phrases from another source and inserting your own words or phrases
- Submitting a piece of work you did for one class to another class

If you have questions on what is plagiarism, please consult the policy (http://www.sa.sdsu.edu/srr/conduct1.html)
and this helpful guide from the Library:
(http://infodome.sdsu.edu/infolit/exploratorium/Standard_5/plagiarism.pdf)

Chem 232L: The laboratory component of the grade will be based on the completion of the experiments, the reports, unknowns, products, quizzes and an evaluation of experimental technique. The laboratory grade (chem 232L) is separate from the chem 232 grade.
You must attend your first scheduled lab or your spot may be forfeit!

To the student and how to succeed in Organic Chemistry (and science in general):

1. *Develop good study habits:*

a. Attend all lectures and labs.
b. Take good lecture notes.
c. Use your lecture notes as a guide to your reading in the textbook. Write your questions down if there is something you don't understand. Ask your instructor if you don't understand a concept.
d. Make flash cards of definitions, concepts, reactions, structures, and nomenclature that are in the textbook that are emphasized by your instructor in lecture. Writing something is equivalent to reading it ten times.
e. Do all the homework problems with the aid of the study guide or answer book. The suggested problems (homework) have about the same difficulty as the problems you will be given on the exams.
f. One of the alternative ways for understanding of organic chemistry is to find a study partner or to form a study group and work on problems independently, and then review the answers in the group.
g. Keep up to date and **don't fall behind**.
h. Seek course advice from science professors and students.
i. If necessary, see your instructor or department for a tutor.
j. Try to see the "big picture"; try to see how the topic of the week fits in with the whole course. If you have a difficulty achieving this, ask your instructor.
k. Practice applying what you have learned in class to the world around you.
l. Try to foster your own scientific curiosity – wonder why things are and how they happen.
m. Put emphasis on understanding concepts rather than memorizing material.
n. If you read the text more than 10 minutes without practicing a problem, something is wrong…..this is not how you should study organic chemistry.

2. *Have a positive attitude*.
3. *Realize that science requires more self discipline than many other majors, but actually offers more rewards*.
4. *Be organized*.
5. *Persevere and be determined to succeed*.

Good Luck in Chem 232!!

Ithaca (a philosophical view of the journey of Organic Chemistry)
by Constantine P. Cavafy
(1863 - 1933)

When you set out on your journey to Ithaca,
pray that the road is long,
full of adventure, full of knowledge.
The Lestrygonians and the Cyclops,
the angry Poseidon -- do not fear them:
You will never find such as these on your path,
if your thoughts remain lofty, if a fine
emotion touches your spirit and your body.
The Lestrygonians and the Cyclops,
the fierce Poseidon you will never encounter,
if you do not carry them within your soul,
if your soul does not set them up before you.

Pray that the road is long.
That the summer mornings are many, when,
with such pleasure, with such joy
you will enter ports seen for the first time;
stop at Phoenician markets,
and purchase fine merchandise,
mother-of-pearl and coral, amber, and ebony,
and sensual perfumes of all kinds,
as many sensual perfumes as you can;
visit many Egyptian cities,
to learn and learn from scholars.

Always keep Ithaca on your mind.
To arrive there is your ultimate goal.
But do not hurry the voyage at all.
It is better to let it last for many years;
and to anchor at the island when you are old,
rich with all you have gained on the way,
not expecting that Ithaca will offer you riches.

Ithaca has given you the beautiful voyage.
Without her you would have never set out on the road.
She has nothing more to give you.

And if you find her poor, Ithaca has not deceived you.
Wise as you have become, with so much experience,
you must already have understood what these Ithacas mean.

Highly recommended problems (Solomons & Fryhle*, Organic Chemistry*, 12th Ed.).

Chapter 1, The Basics, Bonding and Molecular Structure: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 47, 50

Chapter 2, Families of Carbon Compounds: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 46

Chapter 3, Acids and Bases: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38

Chapter 4, Nomenclature and Conformations of Alkanes and Cycloalkanes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 23, 24, 25, 26, 27, 28, 29, 33, 36, 37, 38, 39, 41, 43, 44, 45, 46

Chapter 5, Stereochemistry: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 44, 45, 46, 47, 48

Chapter 6, Nucleophilic Reactions: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 45, 46, 47

Chapter 7, Alkenes and Alkynes I: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44

Chapter 8, Alkenes and Alkynes II: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 53, 54, 59, 61

Chapter 10, Radical Reactions: 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31, 32, 33

Chapter 11, Alcohols and Ethers: 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 52

Lecture and Exam schedule; Chem 232, Fall 2016

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	
29-Aug *Introduction*	**30-Aug**	**31-Aug** *Chapter 2* *Introduction*	**01-Sep**	**02-Sep** *Ch.2 cont.*	
05-Sep *Holiday* ***Labour Day***	**06-Sep**	**07-Sep** *Ch.2 cont.*	**08-Sep**	**09-Sep** *Ch.2 cont.*	
12-Sep *Chapter 3*	**13-Sep**	**14-Sep** *Ch.3 cont.*	**15-Sep**	**16-Sep** *Ch.3 cont.*	
19-Sep *Ch.3 cont.*	**20-Sep**	**21-Sep** *Chapter 4*	**22-Sep**	**23-Sep** *Ch.4 cont.*	**24-Sep** **Midterm 1**
26-Sep *Ch.4 cont.*	**27-Sep**	**28-Sep** *Ch.4 cont.*	**29-Sep**	**30-Sep** *Chapter 5*	
03-Oct *Ch.5 cont.*	**04-Oct**	**05-Oct** *Ch.5 cont.*	**06-Oct**	**07-Oct** *Ch.5 cont.*	
10-Oct *Chapter 6*	**11-Oct**	**12-Oct** *Ch.6 cont.*	**13-Oct**	**14-Oct** *Ch.6 cont.*	
17-Oct *Ch.6 cont.*	**18-Oct**	**19-Oct** *Ch.6 cont.*	**20-Oct**	**21-Oct** *Chapter 7*	**22-Oct** **Midterm 2**
24-Oct *Ch.7 cont.*	**25-Oct**	**26-Oct** *Ch.7 cont.*	**27-Oct**	**28-Oct** *Ch.7 cont.*	
31-Oct *Chapter 8*	**01-Nov**	**02-Nov** *Ch.8 cont.*	**03-Nov**	**04-Nov** *Ch.8 cont.*	
07-Nov *Ch.8 cont.*	**08-Nov**	**09-Nov** *Ch.8 cont.*	**10-Nov**	**11-Nov** *Holiday* ***Veterans Day***	
14-Nov *Chapter 10*	**15-Nov**	**16-Nov** *Ch.10 cont.*	**17-Nov**	**18-Nov** *Ch.10 cont.*	**19-Nov** **Midterm 3**
21-Nov *Ch.10 cont.*	**22-Nov**	**23-Nov** *Holiday* ***Thanksgiving***	**24-Nov** *Holiday* ***Thanksgiving***	**25-Nov** *Holiday* ***Thanksgiving***	
28-Nov *Chapter 11*	**29-Nov**	**30-Nov** *Ch.11 cont.*	**01-Dec**	**02-Dec** *Ch.11 cont.*	
05-Dec *Ch.11 cont.*	**06-Dec**	**07-Dec** *Ch.11 cont.*	**08-Dec**	**09-Dec** *Review*	
12-Dec *Review*	**13-Dec**	**14-Dec** *Last Day of Classes*	**15-Dec** *Final's Week*	**16-Dec** *Begins*	**17-Dec** ***Final Exam*** **09:30-11:30am**
19-May *Final's Week*	**20-May** *Begins*	**21-May**	**22-May**	**23-May**	

Saturday midterm exams, 10 am-Noon, Sep. 24, Oct. 22, Nov. 19
Chemistry 232 Final: Saturday Dec 17, 09:30-11:30 pm ("Group Final")

Welcome to CourseKey!

This course will be using CourseKey (www.thecoursekey.com) - a classroom engagement software that is designed to increase lecture interaction and facilitate peer-2-peer learning. CourseKey allows your instructor to ask questions, take polls, give quizzes, and get feedback from you during class. CourseKey is a bring-your-own-device system, which means that you can use any web-enabled device (laptops, tablets, smart-phones) to participate. It combines features that help the professor more efficiently manage the class and allows students to connect more effectively inside and outside of class.

REGISTRATION INSTRUCTIONS:

You will be able to download the CourseKey student **iOS or Android application** or use it with a **web browser**. If you do not have a smart device please contact the support team at support@thecoursekey.com so that arrangements can be made to accommodate you.

App Store Links

- CourseKey – Student iOS App
- CourseKey - Student Android App

Please follow these instructions to create your account and register for the course through the application.

Step 1: Create Account

To sign up use the following link to create your account: https://portal.thecoursekey.com/signup and simply **follow steps 1-4** in the sign up instructions. See screenshots below for more detailed instructions.

Step 2: Register for the Course

To register for the class log in at: https://portal.thecoursekey.com/login

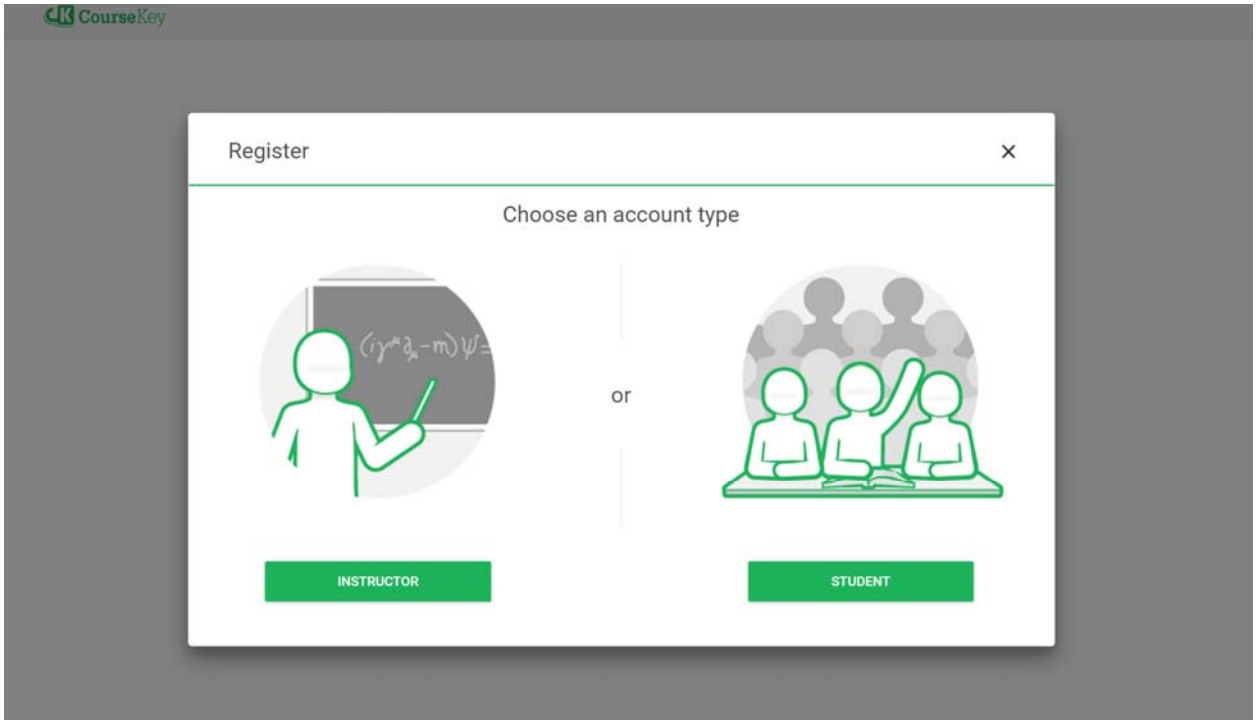
- Once logged in, click the "+" to **Add a Course**.
- You can add your class in two ways:
  - Searching for the instructor's name and selecting the class with the appropriate days and times.
  - Copy the following **Add Code** into the *Course Code* field and you will be automatically added to the correct class: **ck537io**

If you require assistance you can contact CourseKey Support at: support@thecoursekey.com

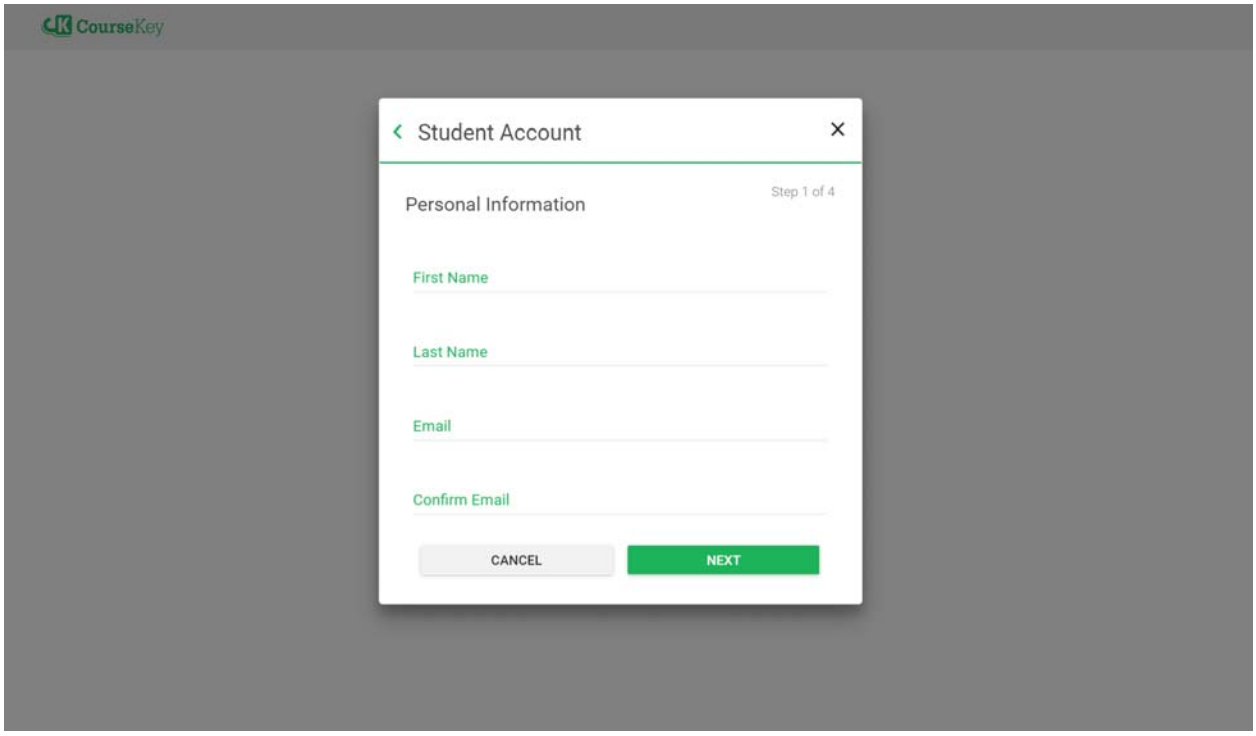
CREATING A STUDENT ACCOUNT: STEP-BY-STEP

1. Go to CourseKey Portal (www.portal.thecoursekey.com).

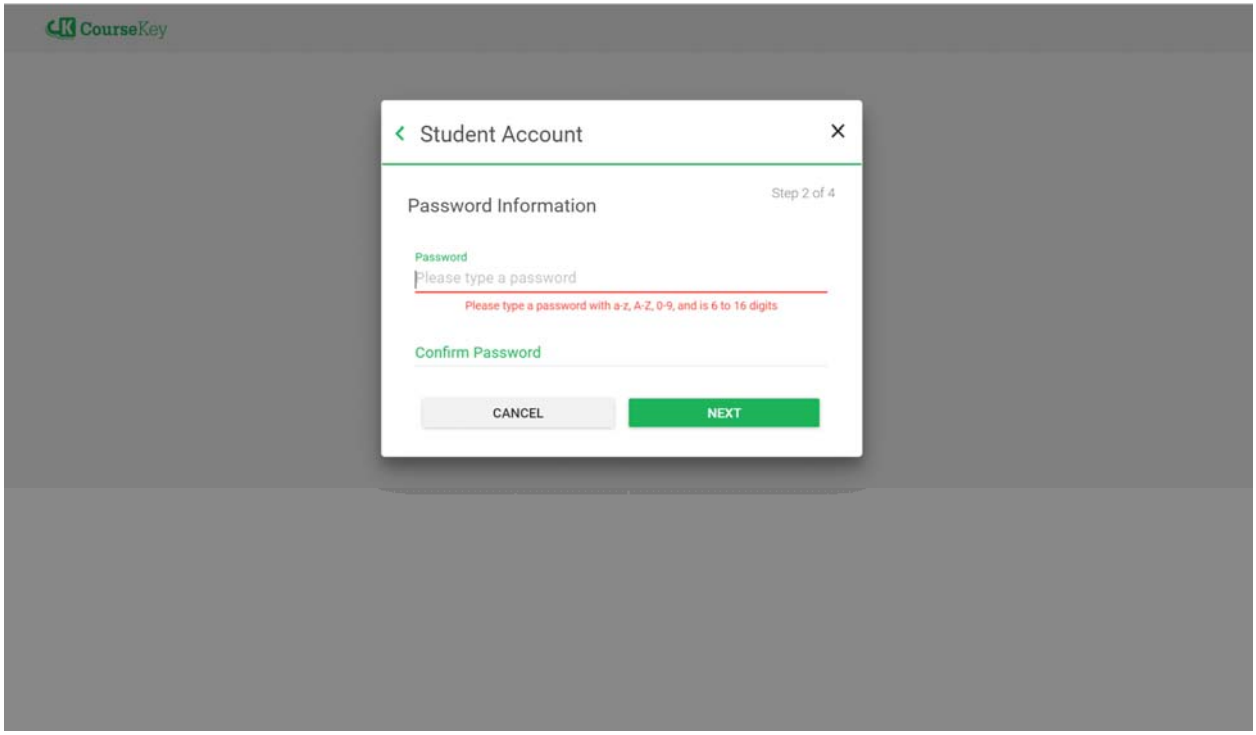
2. Select “student” when creating your student account.



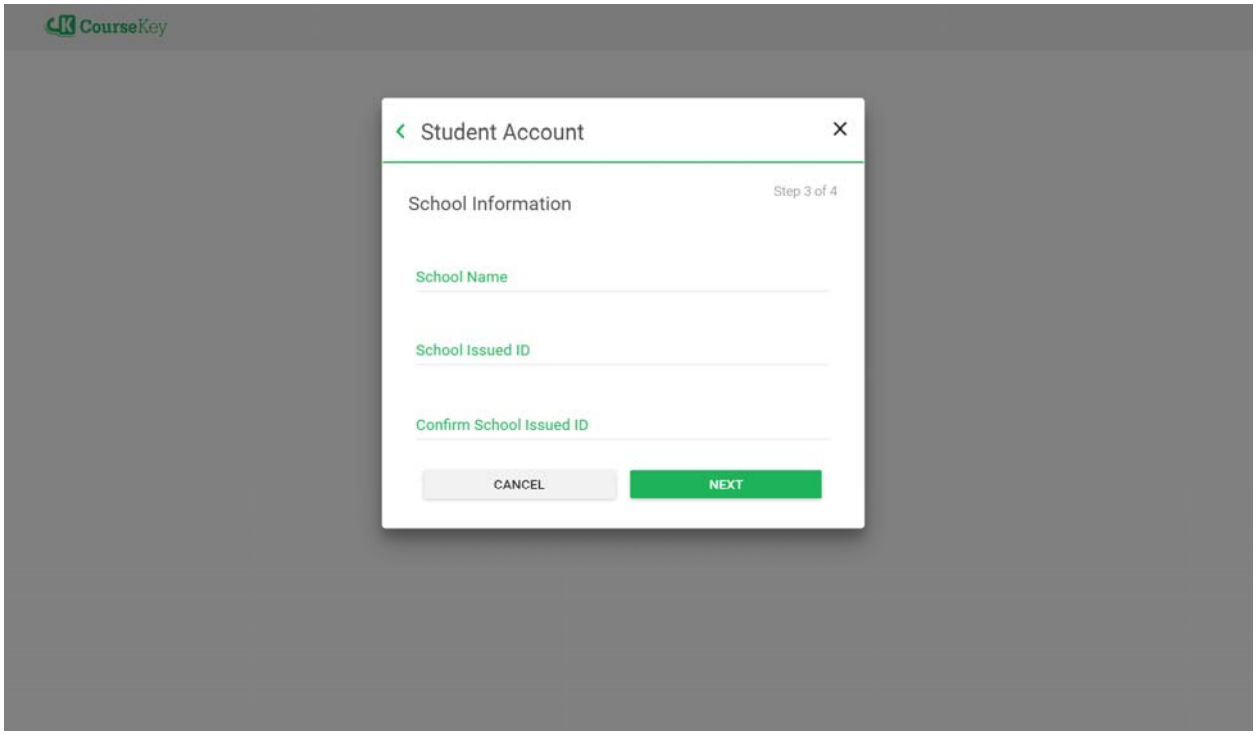
3. Enter your name and email address



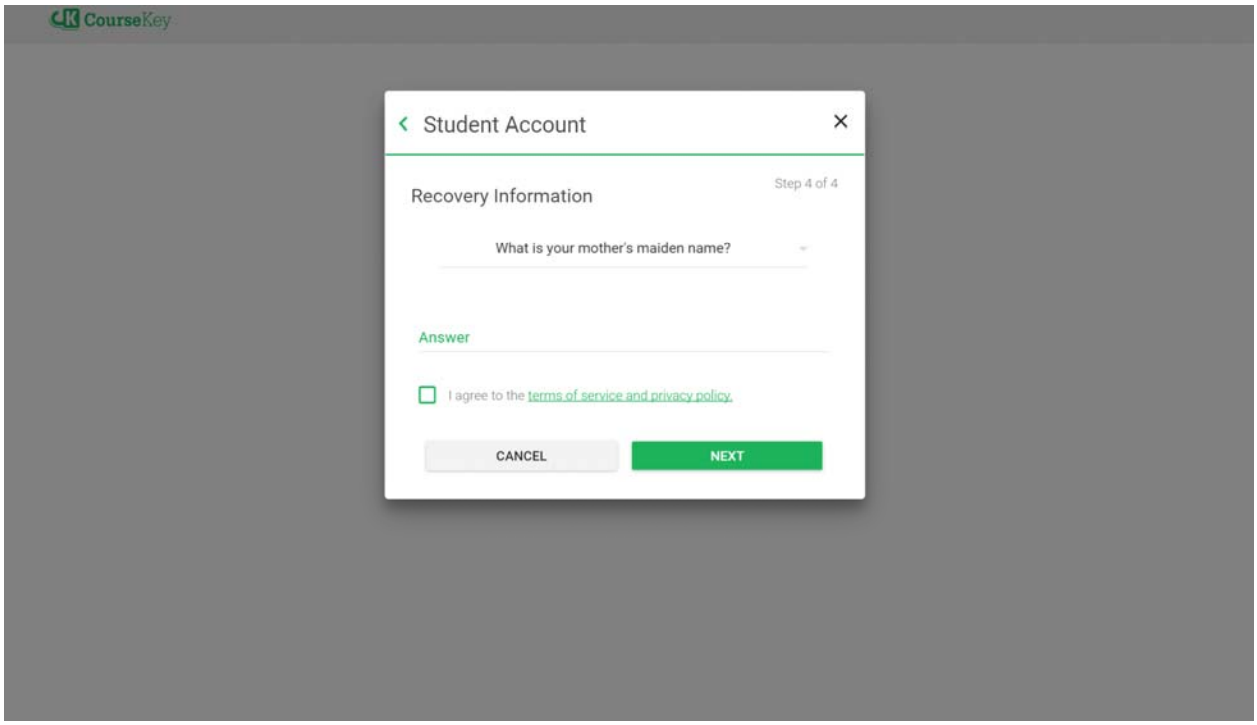
4. Enter your password. Make sure it is a secure password and it contains 6 to 16 characters, upper and lowercase letters, and at least one number.



5. Enter your student ID number. Be sure to enter your school-issued student ID number. This will assist your instructor when it comes time to upload any of your grade data and ensures you are properly credited.



6. Select a security questions and you'll be done!



Congratulations! You've just created your CourseKey student account. To add a course, click the "+" sign in the top-right corner and find the course by searching the professor's name or inserting the unique class code for the class. In the event you need to enroll in another CourseKey course, simply click the "+" sign and follow the same process.

Important notes:

- Your instructor will get notified if a screenshot is taken of any assessment or poll. Please note that this may be considered academic dishonesty and disciplinary actions may be taken by the instructor.

- The ability to ask questions to the instructor anonymously means you'll be anonymous to the rest of the class, NOT the instructor. Please consider this and be courteous when asking questions.

- Please note that ANY SUPPORT/TROUBLESHOOTING question regarding CourseKey SHOULD NOT be directed to the instructor. We have a Customer Service support team eager to talk to you! You may contact us through our LIVE CHAT or you may send us an email to support@thecoursekey.com

You can visit the CourseKey Youtube channel for the Student Quick Start Guide which outlines how you will register for a student account, as well as providing a brief overview to get you registered for the class.