General Education Council (GEC)
General Committee
Minutes
MS Teams Virtual Meeting

October 19, 2021

I. Attendance
- Attendance (and quorum verification) was documented based on the individuals attending who typed their name in the chat box to be recorded. *(Attached)*

II. Minutes
- The Chair called for any corrections to the minutes from the September 21, 2021 GEC General Committee meeting. There were none. Holly Deal motioned to approve, and Tim Mathews seconded. The minutes were approved as written.

III. Unfinished Business
- Foreign Languages Proposal: The Executive Committee voted to approve the Foreign Languages proposal at their committee meeting on October 12, 2021.

IV. New Business
- MATH 1179 proposal (new course proposal)
  Lake Ritter presented information on the new course MATH 1179.
  - This is a calculus course for the life sciences. It was developed in collaboration with Math and Biology to show biology and life sciences students the need to take a calculus course as part of their degree program.
  - MATH 1190 has a high DFW rate because of its content rigor and the required prior math knowledge. Many students question the "why" of taking MATH 1190 and how it applies to their career plan. MATH 1190 is usually followed by Calculus II, a terminal calculus course.
  - MATH 1179 will still provide problem-solving using calculus in context for the life sciences students.
  - MATH 1179 will have the same placement pre-requisites as MATH 1190. It will be a terminal course and not satisfy alone as a pre-requisite for Calculus II. A student would need to also take MATH 1189, as a bridge course, to equal MATH 1190 and meet the pre-requisite for Calculus II. However, MATH 1189 is not a General Education course.
  - If students can be identified ahead of time and grouped by those who should take MATH 1190 and those who should take MATH 1179, it could provide a better pathway for student success.
  - There is a challenge that this has been developed as a 4-hour course which leaves a carryover of 1 hour for biology students to have to take a related study course from Area F to make up that hour.

- ARTS 1100 proposal (eCore)
  - Kris DuRocher advised the GEC that they are being asked to review the ARTS 1100 proposal to ensure it aligns with Area C2 outcomes and can be

added to eCore so students can receive GenEd credit. The course has not been through an institutional review before.
  - It will not be part of the General Education core at KSU.
  - It is the same content as the KSU course but in a different format.
  - It was asked if enrollment can be managed because more students may want to take the eCore version instead of the on-campus version. Kris replied that KSU can manage eCore enrollment. eCore is mostly designed for online students.
- Heading changes/Outcome names in Areas B and C in the catalog
  - Kris DuRocher advised the GEC that there was no record of approval by the USG for the headings and sub-headings in these areas that KSU is currently using.
  - Area headings/sub-heading names need to align with the learning outcomes.

V. Announcements
- Next GEC Executive Committee meeting: November 2, 2021 at 12:30 p.m.
- Next GEC General Committee meeting: November 16, 2021 at 12:30 p.m.

Meeting schedules with links, agendas, and minutes can be found on the https://cia.kennesaw.edu website under Curriculum Committees, GEC, Schedule/Agenda/Minutes.

VI. Adjournment
- The Chair called for any further business. Hearing none, the chair adjourned the meeting at 1:26 p.m.

General Education Council
Attendance – October 19, 2021

Representing	First Name	Last Name	Present	Proxy Name	Absent
Bagwell College Education	Brendan	Callahan	☒		☐
Coles College of Business	Timothy	Mathews	☒		☐
College of Architecture and Construction Management	Jacqueline	Stephens	☒	Hussein Abaza	☐
College of Computing and Software Engineering	Holly	Deal	☒		☐
College of Science and Mathematics	Matthew	Laposata	☒		☐
College of the Arts	Edward	Eanes	☐		☐
Journey Honors College	Vacant		☐		☐
Radow College of Humanities and Social Sciences	Thomas	Doleys	☒		☐
Southern Polytechnic College of Engineering and Engineering Technology	Matt	Marshall	☒		☐
Wellstar College of Health and Human Services	Afekwo "Mary"	Ukuku	☐	?	☐
Total Voting Members in Attendance					

Advisory (Non-voting)	First Name	Last Name	Present		Absent
COTA-Art and Design	Joe	Thomas	☐		☐
COTA-Dance	Natalie	Berry	☐		☐
COTA-Music	Edward	Eanes	☐		☐
COTA-Theatre & Performance Studies	Jim	Davis	☒		☐
CSM-Biology: Ecology, Evolution, and Organismal	Matthew	Laposata	☒		☐
CSM-Biology: Molecular and Cellular	Liz	Harrison	☐		☐
CSM-Chemistry	Thomas	Leeper	☒		☐
CSM-Mathematics	Ken	Keating	☒		☐
CSM-Physics	Ben	Rybolt	☒		☐
HONORS	Daniel	Audia	☒		☐
RCHSS-Anthropology & Geography	Wayne	Van Horne	☒		☐
RCHSS-Communication	Meredith	Ginn	☒		☐
RCHSS-Composition & Literature	Jeanne	Bohannon	☒		☐
RCHSS-Criminal Justice & Sociology	Linda	Treiber	☒		☐

General Education Council
Attendance – October 19, 2021

RCHSS-Foreign Languages	Audry	Garcia	☒		☐
RCHSS-History & Philosophy	Susan	Rouse	☒		☐
RCHSS-Interdisciplinary Studies	Lauren	Thompson	☐		☐
RCHSS-Political Science	Tom	Doleys	☒		☐
RCHSS-Psychology	Lauren	Taglialatela	☒		☐
Faculty Executive Director of General Education and Curriculum Development	Kris	DuRocher	☒		☐
Advising	Jerryl	Morris	☒		☐
Assessment Office	Donna	DeGrendel	☒		☐
Associate Vice President for Curriculum or designee	Anissa	Vega	☒		☐
Chairs Directors Assembly	TBD		☐		☐
Curriculum Support Office**	Amy	Jones	☒		☐
Curriculum Support Office**	Raven	Malliett	☒		☐
Registrar or designee**	Gabriel	Lindo-Ardila	☐		☐
Undergraduate Student Representative (SGA)**			☐		☐
Guests	**First Name**	**Last Name**			
CSM	Lake	Ritter			
RCHSS	Carmen	Skaggs			
Institutional Accreditation	Danielle	Buehrer			
Registrar	Mardi	Richardson			

General Education Council (GEC)
General Committee
Agenda
MS Teams Virtual Meeting

https://cia.kennesaw.edu/curriculum-committees/gec.php

October 19, 2021

I. Welcome and Attendance
(Note: Attendance is documented based on those individuals who type their name in the chat box.)

II. Old Business
- Approval of Minutes from the September 21, 2021 meeting. *(Attached)*
(Note: If there are no corrections, the minutes will stand approved as written.)
- Foreign Languages Proposal Update

III. New Business
- Presentation and discussion of MATH 1179 proposal (new course proposal)
- Discussion of ARTS 1100 proposal (review for alignment with C2 outcome, not adding course to KSU core)
- Discussion of heading changes/outcome names in Areas B and C in the catalog
- GEC Executive Committee meeting summary

IV. Announcements
- Next GEC Executive Committee meeting: November 2, 2021 at 12:30 p.m.
- Next GEC General Committee meeting: November 16, 2021 at 12:30 p.m.

Meeting schedules with links, agendas, and minutes can be found on the https://cia.kennesaw.edu website under Curriculum Committees, GEC, Schedule/Agenda/Minutes.

Welcome!

The meeting will start shortly

We ask that *everyone mute their mic and turn off their camera* when you are not speaking. (This will assist with bandwidth issues.)

We ask that you please use the "Raise Your Hand" feature to request to speak. *(You need to have the full screen shown to see the "raise your hand" icon.)*

- Click the icon and wait for your name to be called.
- If you are not called upon in a timely manner, speak during the next pause in the discussion.

Please turn on your camera when you are speaking for accessibility purposes.
[For individuals with any hearing impairment, "Live Captions" is available. To turn on "Live Captions", click on the ellipsis (⋯) and select the option.]

General Education Council Meeting

10.19.21

Agenda

- I. Welcome and Attendance
- II. Old Business
- III. New Business
- IV. Announcements

Acceptance of Agenda

- If there are no updates or edits, the agenda will stand accepted as written.

1. Attendence

Attendence

- Attendance is recorded by members and guests by typing their name in the Chat Box.
- If you are a proxy for a member, please note your name and then “proxy for <member name>”

2. Old Business

Approval of Minutes

- Minutes from Sept. 21, 2021
- Any updates or changes?
- Please type a motion to approve in the chat
- Please type a second in the chat
- Vote: Please type your last name and yes to approve or no to not approve

Update on Voting Agenda

- Foreign Language proposals update
- Executive committee voted to approve

3. New Business

Math 1179 (and 1189) Presentation

- Lake Ritter
  https://kennesaw.curriculog.com/proposal:13404/form

Description:*

This course introduces the central concepts of single variable calculus including limits, derivatives, and integrals of algebraic and transcendental functions with particular motivations from and application to the Biological Sciences. Special emphasis will be given to using the tools of calculus to build and analyze mathematical models, especially those arising in the life sciences.

Notes: Students completing this course may not also receive credit for MATH 1190.

ARTS 1100

Description:*

This course is a 3 semester-credit-hour course focused on fostering an awareness, understanding, and appreciation for the visual arts. Through exposure to cross-cultural art images throughout history, students will build a global artistic vocabulary that allows for the constructive analysis of art objects. Students will also gain an understanding of the influence of art on other important aspects of culture including politics, history, religion, and science.

This course is managed through the cooperative academic agreement known as eCore.

- https://kennesaw.curriculog.com/proposal:13551/form
- GEC to validate course alignment to C2 outcome
- Not adding to KSU offerings in C2
- Course part of the eCore Cooperative Academic Arrangement

Global Perspectives: Students will analyze creative works from multiple international cultures in relation to the historical, political, economic, sociocultural, aesthetic, or personal contexts in which those works emerged.

Discussion of Heading and Outcome Changes

Area C:

- ~~Literature~~ Humanities: Students will include multicultural, social, or historical contexts in their interpretation of literary work.
- ~~Global Perspectives:~~ Fine Arts: Students will analyze creative works from multiple international cultures in relation to the historical, political, economic, sociocultural, aesthetic, or personal contexts in which those works emerged.

Area C: Humanities, Fine Arts, and Ethics - (6 Credit Hours)

C1: ~~Literature of the World~~ Humanities (3 Credit Hours)

Select one from the following:

- ENGL 2110:World Literature
- ENGL 2120:British Literature
- ENGL 2130:American Literature
- ENGL 2300:African-American Literature
- PHIL 2010:Introduction to Philosophy

C2: ~~Arts and Culture of the World~~ Fine Arts (3 Credit Hours)

Select one from the following:

- ART 1107:Art in Society
- DANC 1107:Dance in Society
- MUSI 1107:Music in Society
- TPS 1107:Theatre in Society

Discussion of Heading Changes

Area B:

Critical Thinking: Students will evaluate and synthesize information to support ideas and perspectives.

Area B: Institutional Option - Critical Thinking - (5 Credit Hours)

B1: ~~Contemporary Economic Issues~~ (2 Credit Hours)

- ECON 1000:Contemporary Economic Issues

B2: ~~Cultural Perspectives~~ (3 Credit Hours)

Select one from the following:

Executive Meeting Summary

- Added Headings and outcome changes discussion to agenda
- Foreign Language discussion/vote
- Added MATH 1179 and ARTS 1100 to discussion agenda
- Discussion on how to disseminate Executive Council content
- Presentation on transfer in the Core Curriculum from the Registrar's office

4. Announcements

Next Meetings:

- Next GEC Executive Committee meeting: November 2, 2021, at 12:30 p.m.
- Next GEC General Committee meeting: November 16, 2021, at 12:30 p.m.

- Meeting schedules with links, agendas, and minutes can be found on the https://cia.kennesaw.edu website under Curriculum Committees→ GEC→Schedule/Agenda/Minutes

Adjournment

- Motion to Adjourn
- **Thank you!**

Calculus for Life Sciences

Mario Bretfeld (EEOB)
Somayeh Mashayekhi (MATH)
Lake Ritter (MATH)
Glenn Young (MATH)

With special thanks to
Meghan Burke & Ken Keating

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Challenges in Biology Education:

- Life science students at KSU (and other institutions) question the relevance and applicability of calculus to their degree program and career goals.

- An interdisciplinary course, developed by faculty in Math and Bio, can positively affect student's attitude towards the application of math to biological studies (Luque et al., 2021).

- Demonstrating the value of other STEM disciplines to biology is effective (Redish et al., 2014) but remains a critical need in advancing life science education (Aikens 2020).

An excellent hub for additional resources and information is **Q**uantitative **U**ndergraduate **B**iology **E**ducation and **S**ynthesis; (QUBES) https://qubeshub.org/

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MATH 1190 is among the General Education courses with high DFW rates. Between Fall 2016 and Spring 2021, the DFW rate among

- All CSM majors: 38.2%
- The Two Math B.S. programs: 26.7%
- The B.S. Biology and B.S. Env. Sci.: 39.3%
- Eng. & Eng. Tech: 34.3%
- CCSE: 40.5%

KENNESAW STATE UNIVERSITY

CSM Advising

Students report a number of issues with Calculus:

1) They've never seen any math course close to the rigor of 1190 or

2) They've never had to apply so much previous course knowledge or

3) They become frustrated and don't see it's relevance or appropriateness to themselves or their career/educational goals. We hear from them "I don't see why I need to know Calculus if I want to be a Doctor" (or exchange doctor with conservationist, wildlife biologist, microbiologist, etc.)

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MATH 1179 Calculus for Life Sciences

This course will serve students in the following programs

- Biology B.S. and
- Environmental Science B.S.

The new course was deemed sufficient preparation for

- CHEM 2800 Quantitative Analytical Chemistry and
- BIOL 4500K:Bioinformatics I

This course will satisfy the area D with one hour carry over into area F for these existing degree plans.

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MATH 1179 Calculus for Life Sciences

What is this course?

It's a terminal Calculus course in which calculus topics are motivated and developed in context of solving problems—most notably from life science applications.

How is it different from MATH 1160?

Unlike many applied (or business) calculus courses, students will need a full pre-calculus background including familiarity with trigonometric functions.

How is it different from MATH 1190?

This course will include broader coverage of differential and integral calculus. Memorization of mathematical rules will be de-emphasized in favor of using mathematics in modeling contexts.

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MATH 1179 Calculus for Life Sciences

Prerequisites: MATH 1113 or by placement

The placement criteria will match that of MATH 1190

High school GPA ≥ 3.2 AND ACT math score ≥ 26 or SAT math score ≥ 620 (600 if taken prior to March 2016)

OR

ALEKS score = 76

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MATH 1179 Calculus for Life Sciences

Catalog Description:

MATH 1179: Calculus for Life Sciences

4 Class Hours 0 Laboratory Hours 4 Credit Hours

Prerequisite: MATH 1113, or By Placement

This course introduces the central concepts of single variable calculus including limits, derivatives, and integrals of algebraic and transcendental functions with particular motivations from and application to the Biological Sciences. Special emphasis will be given to using the tools of calculus to build and analyze mathematical models, especially those arising in the life sciences.

Notes: Students completing this course may not also receive credit for MATH 1190. This course does not satisfy the prerequisite requirements for MATH 2202.

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MATH 1179 Calculus for Life Sciences

Expected Learning Outcomes:

Upon completing this course, students will be able to:

1. Evaluate problems in life sciences and demonstrate how derivatives or integrals can help find solutions.
2. Explain the fundamentals of and evaluate limits, derivatives, and integrals using tabular, graphical, and algebraic techniques and examples.
3. Use the calculus tools of limits, derivatives, and integrals to build and analyze mathematical models, including differential equations, of problems that arise in the life sciences.

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MATH 1189 Bridge to Calculus II

What if a student changes majors or decides she wants to take more mathematics?

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MATH 1189 Bridge to Calculus II

What if a student changes majors or decides she wants to take more mathematics?

MATH 1179 does not satisfy the MATH 2202 prerequisite. A few topics need to be covered and computational fluency emphasized.

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MATH 1189 Bridge to Calculus II

MATH 1189: Bridge to Calculus II

1 Class Hours 0 Laboratory Hours 1 Credit Hours

Prerequisite: MATH 1179

This 1-hour course is for students who have completed Calculus for Life Sciences and will prepare them to be successful in Calculus II. A brief review of Calculus I is provided with special emphasis on select topics that are not covered in MATH 1179. These include Continuity, Limits involving infinity, Calculus of Inverse Trigonometric functions, The Mean Value Theorem, and L'Hôpital's rule.

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MATH 1189 Bridge to Calculus II

Week	Text Sections[a]	Topic
1	2.2, 2.4	Limits, Limit Laws, One sided Limits
2	2.5[b]	Continuity (Includes IVT)
3	2.6	Limits involving infinity, Asymptotes
4	Assessment 1	Proficiency with limits & continuity
5	3.1, 3.2	The derivative at a point and as a function
6	3.3, 3.5	Differentiation rules, Derivative of Trigonometric Functions.
7	3.6, 3.7	Chain rule, Implicit Differentiation
8	3.8	Derivatives of inverse functions and logarithms
9	3.9	Inverse trigonometric functions
10	Assessment 2	Proficiency with derivatives & differentiation
11	4.2	The Mean Value Theorem
12	4.5	Indeterminate Forms & L'Hôpital's rule
13	5.1, 5.2	Areas, Sigma notation, Reimann sums
14	5.3, 5.4	The definite integral, Fundamental Theorem of Calculus
15	Assessment 3	Proficiency with L'Hôpital's rule & Integrals

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a Text: (Note this is the departmentally approved text required for MATH 2202)
Thomas' Calculus, Early Transcendentals, 14th edition, by Joel Hass, Christopher Heil, and Murice D. Wei

b Items Highlighted are those topics not covered or covered only superficially in MATH 1179.

References

Aikens, M. L. (2020). Meeting the needs of a changing landscape: Advances and challenges in undergraduate biology education. *Bulletin of mathematical biology*, *82*, 1-20.

Luque, A., Mullinix, J., Anderson, M., Williams, K. S., & Bowers, J. (2021). Aligning Calculus with Life Sciences Disciplines: The Argument for Integrating Statistical Reasoning. *PRIMUS*, 1-19.

Robeva, R. S., Jungck, J. R., & Gross, L. J. (2020). Changing the nature of quantitative biology education: data science as a driver. *Bulletin of Mathematical Biology*, *82*(10), 1-30.

KENNESAW STATE UNIVERSITY

About the General Education Program

Kennesaw State University's General Education program offers a comprehensive series of interrelated courses in the liberal arts and sciences for all KSU students. Whereas the major program contributes depth within a chosen specialization, the General Education Core Curriculum Areas A-E provide a breadth of understanding within a variety of disciplines. Together, the General Education Core Curriculum and the major degree program offer students the knowledge, skills, and perspectives to become informed and engaged citizens living in a diverse, global community.

LEARNING OUTCOMES

Students will encounter the General Education learning outcomes over the course of their General Education Core Curriculum in Areas A-E.

- **Written Communication:** Students will write & communicate at a college level in various modes, media, and/or rhetorical contexts.
- **Reading Comprehension:** Students will demonstrate an ability to comprehend, analyze, & interpret texts in various modes, genres, media, and/or contexts.
- **Quantitative Learning:** Students will demonstrate the ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables) and/or convert information into mathematical forms at a level appropriate for the complexity of problems in a college-level course.
- **Critical Thinking:** Students will evaluate and synthesize information to support ideas and perspectives.
- **Humanities:** Students will include multicultural, social, or historical contexts in their interpretation of literary work.
- **Fine Arts:** Students will analyze creative works from multiple international cultures in relation to the historical, political, economic, sociocultural, aesthetic, or personal contexts in which those works emerged.
- **Applied Math:** Students will demonstrate an ability to effectively apply symbolic representations to model and solve problems.
- **Natural Sciences:** Students will demonstrate an understanding of college-level scientific principles, theories, and laws, and apply them to solve problems and explore natural phenomena.
- **U.S. Perspectives:** Students will demonstrate a broad understanding of history, political systems, or culture of the U.S.
- **Social Sciences:** Students analyze the complexity of how historical, economic, or political relationships develop, persist, or change.

Area B: Institutional Option - Critical Thinking - (5 Credit Hours)

B1: (2 Credit Hours)

- ECON 1000:Contemporary Economic Issues

B2: (3 Credit Hours)

Select one from the following:

- AADS 1102:Issues in African and African Diaspora Studies
- AMST 1102:American Identities
- ASIA 1102:Introduction to Asian Cultures
- COM 1100:Human Communication
- FL 1002:Introduction to Foreign Language and Culture II (Any of the following courses can be taken to satisfy FL 1002: FL 1002, CHIN 1002, FREN 1002, GRMN 1002, ITAL 1002, JPN 1002, KOR 1002, LATN 1002, PORT 1002, RUSS 1002, SPAN 1002. Some sections of FL 1002 may include Arabic, Hebrew, Hindi, etc. which can also be taken.)
- GWST 1102:Love and Sex
- LALS 1102:Understanding Latin America
- LDRS 2300:Leadership & Intercultural Competence
- PAX 1102:Understanding Peace and Conflict
- PERS 2700:Perspectives on the World of Work
- POLS 2401:Global Issues
- RELS 1102:Introduction to Religion

Area C: Humanities, Fine Arts, and Ethics - (6 Credit Hours)

C1: Humanities (3 Credit Hours)

Select one from the following:

- ENGL 2110:World Literature

- ENGL 2120:British Literature
- ENGL 2130:American Literature
- ENGL 2300:African-American Literature
- PHIL 2010:Introduction to Philosophy

C2: Fine Arts (3 Credit Hours)

Select one from the following:

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- MUSI 1107:Music in Society
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