Mar 6th, 1:50 PM - 2:35 PM

USG MATH 1113 Emporium: Insights from an Online Precalculus Course

Nathan W. Moon Dr.
*Georgia Institute of Technology - Main Campus*, nathan.moon@cacp.gatech.edu

Kris Biesinger Dr.
*University of Georgia*, krisb@uga.edu

Chuck Katal Dr.
*University of Georgia*, ckutal@uga.edu

Follow this and additional works at: [https://digitalcommons.georgiasouthern.edu/stem](https://digitalcommons.georgiasouthern.edu/stem)

Recommended Citation
Moon, Nathan W. Dr.; Biesinger, Kris Dr.; and Katal, Chuck Dr., "USG MATH 1113 Emporium: Insights from an Online Precalculus Course" (2015). *Interdisciplinary STEM Teaching & Learning Conference*. 34.
[https://digitalcommons.georgiasouthern.edu/stem/2015/2015/34](https://digitalcommons.georgiasouthern.edu/stem/2015/2015/34)

This event is brought to you for free and open access by the Conferences & Events at Digital Commons@Georgia Southern. It has been accepted for inclusion in Interdisciplinary STEM Teaching & Learning Conference by an authorized administrator of Digital Commons@Georgia Southern. For more information, please contact digitalcommons@georgiasouthern.edu.
USG MATH1113 Emporium: Insights from an Online Precalculus Course

Georgia Scholarship of STEM Teaching and Learning Conference
March 2015
Presenters

Kris Biesinger
Project Manager, Online Precalculus Emporium
University of Georgia

Charles Kutal
Project Lead
Director, Office of STEM Education
Associate Dean & Chemistry Professor
University of Georgia

Nathan Moon
Project Evaluator
Associate Director for Research
Center for Advanced Communications Policy
Georgia Institute of Technology
AGENDA

Why Precalculus?

The Emporium Model

The Evolving Design

Next Steps
The USG STEM Initiative works with USG institutions and P-12 partners to increase:

1. The number of P-12 students who prepare for and are interested in majoring in STEM in college,

2. The success rates (retention, progression, and graduation) and number of students in college who pursue the STEM disciplines, and

3. The number of teachers who are prepared in science and mathematics.
Why Precalculus?

21,000+
Annual Enrollments

USG MATH 1113 (2012) Enrollments
Why Precalculus?

37.7% Do Not Succeed
Complete College Georgia

- Mandate to increase postsecondary attainment to 60% by 2025
- Precalculus as Area A and Area D requirements
- Efforts at “Transforming Remediation”
- New Learning Models (NLM) Initiative
Goals

- Access
- High Quality
- Affordability
- Performance
The Emporium Model
“The Emporium Model is as close to a silver bullet as one can get in the complex world of teaching and learning.”

(The Math Emporium: Higher Education’s Silver Bullet, Twigg, 2011)
**Course Timeline**

**FA 2013**

**DESIGN**
- Discussion Forum
- Online Study Hall
- Homework
- Quizzes & Tests
- Online Proctoring

**SP 2014**

**PILOT I**
- 5 Institutions
- 212 Students
- 6 Instructors
- 2 GTAs

**SU 2014**

**REDESIGN**
- Orientation Module
- Gated Progress
- Module Balancing
- Weekly Pacing
- New Videos
- Adjusted Scoring
- Practice Tests
- 3 Proctored Tests
- Group Engagement

**FA 2014**

**PILOT II**
- 1 Institution
- 74 Students
- 1 Instructor
- 2 GTAs
- 2 Peer Mentors

**SP 2015**

**PILOT III**
- 3 Institutions
- 150 Students
- 3 Instructors
- 2 GTAs
- 6 Peer Mentors

**Supplemental Instruction**
- Study Groups
Project Evaluation Activities
• Course Performance Data
• Module and End-of Term Surveys
• Analysis of Student Demographic and Participation Data
• Faculty Interviews to Inform Refinement

Key Findings
• Variations in Institutional Performance
• Challenges of Withdrawal and Non-Participation
• Use/Non-Use of Instructional Materials and Pedagogical Elements
• Correlation between Experiential Elements (Homework, Quizzes) and Overall Course Performance
• Issues of Student Engagement and Involvement
Course Elements

NEW ORIENTATION MODULE

1. Welcome Letter from the Instructor
2. Fall Syllabus 2014 Clarifications
3. Course Nav Overview Video
4. Myths and Facts
5. Time Management Plan – Activity
6. Academic Honesty etc. – Activity
7. Orientation Quiz – Gatekeeper
## Module Balancing

**New Module 1:** Chapters 2.2 – 2.5, Test September 11-12 *(Proctored)*

**New Module 2:** Chapters 2.6 – 4.5, Test October 8-9

**New Module 3:** Chapters 4.6 – 5.6, Test November 5-6 *(Proctored)*

**New Module 4:** Chapters 5.7 – 6.6, Test December 4-5

Chapters 7.1 – 7.2, Final Exam Dec. 11-12 *(Proctored)*

No Midterm – 3 Proctored Exams – Practice Test before Mod 1 Test

### Spring 2014

<table>
<thead>
<tr>
<th>Element</th>
<th>Grade %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>5%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>5%</td>
</tr>
<tr>
<td>Mod Tests (4)</td>
<td>10% ea = 40%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Fall 2014

<table>
<thead>
<tr>
<th>Element</th>
<th>Grade %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>12%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>12%</td>
</tr>
<tr>
<td>Mod Tests (4)</td>
<td>12.5% ea = 50%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Participation</td>
<td>1%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Course Elements

Weekly Pacing & Structure

• Content arranged by week
• Due Date every Monday night
• Time Management plan submitted during Orientation
• Progress monitoring and communication as needed
• Administrative Withdrawal
Course Elements

NEW CONTENT

- 175 Instructor-made Videos
- 2 – 10 minutes in Length
- All Captioned
- Hosted on YouTube
- Embedded in GoVIEW
GROUP ENGAGEMENT

- Fall 2014:
  - Small Discussion Groups
  - Monitored by Peer Mentors
  - Non-threatening environment
- Spring 2015
  - Supplemental Instruction via ‘Digital Study Groups’
  - Led by peer mentors on Blackboard Collaborate
  - [http://youtu.be/GYrcxrC1QbQ](http://youtu.be/GYrcxrC1QbQ)
Welcome to MATH1113!

Posted Nov 18, 2014 4:23 PM

We are glad to have you with us! Take a minute to look around, then get started by clicking on the ‘Orientation’ folder over in the Content Browser. You have a ton of resources at your disposal here in the MATH1113 Precalculus Emporium. It is important to spend a little time with the orientation materials to get your bearings. Plus, you’ll have to score a 100% on your ‘Orientation Quiz’ before additional information will become available.

Looking forward to a great semester,
The MATH1113 Precalculus Emporium Team

Course Layout Improvements

MATH1113 Precalculus Emporium Spring 2015 CO

News

Welcome to MATH1113!

News

Content Browser

Welcome to MATH1113!

Weekly Message

What’s Due This Week?

Digital Study Groups

Course Administration

Site Setup

Site Resources

Calendar

Content

Admin

Assessments

Resources

Communication

WebAssign

News

Welcome to MATH1113!

News

Content Browser

Welcome to MATH1113!

Weekly Message

What’s Due This Week?

Digital Study Groups

Course Administration

Site Setup

Site Resources

Calendar

Content

Admin

Assessments

Resources

Communication

WebAssign

News

Welcome to MATH1113!

News

Content Browser

Welcome to MATH1113!

Weekly Message

What’s Due This Week?

Digital Study Groups

Course Administration

Site Setup

Site Resources

Calendar

Content

Admin

Assessments

Resources

Communication

WebAssign

News

Welcome to MATH1113!

News

Content Browser

Welcome to MATH1113!

Weekly Message

What’s Due This Week?

Digital Study Groups

Course Administration

Site Setup

Site Resources

Calendar

Content

Admin

Assessments

Resources

Communication

WebAssign

News

Welcome to MATH1113!

News

Content Browser

Welcome to MATH1113!

Weekly Message

What’s Due This Week?

Digital Study Groups

Course Administration

Site Setup

Site Resources

Calendar

Content

Admin

Assessments

Resources

Communication

WebAssign
Reducing Costs

Faculty
Graduate Assistants
Peer Student Mentors
Students

MATERIALS
INSTRUCTIONAL DELIVERY
Lessons Learned

• Higher ABC rates; lower DF rates
• Improvements to Course Navigation and Orientation have been important
• Continuing Challenges
  • Student Engagement
    • Non-Participation
    • Student Interaction and Community
    • Withdrawals
  • Pedagogy
    • Emphasizing experiential learning
    • Support for various learner types...
Moving the Needle

- Access
- High Quality
- Affordability
- Performance
“YOU NEVER CHANGE THINGS BY FIGHTING THE EXISTING REALITY. TO CHANGE SOMETHING, BUILD A NEW MODEL THAT MAKES THE EXISTING MODEL OBSOLETE.”

Buckminster Fuller
MATCHING STUDENT CHARACTERISTICS WITH FORMAT
Ongoing Improvements

• Partnerships
  • Outside Review
  • Participating Institutions
• Challenges
  • Institutional Differences (schedules, academic policies, etc.)
  • Enrollment Procedures
  • Communication and Engagement
The presenters acknowledge the support of the Office of Educational Access and Success (OEAS), University System of Georgia (UGS), including Myk Garn, Asst. Vice Chancellor for New Learning Models.

The presenters wish to acknowledge support from the development and design team, including Cole Causey, Lisa Townsley, and Malcolm Adams, as well as support from institutional partners at UGA, GSU, MGSC, VSU, GPC, and KSU and all course instructors, TAs, and peer leaders, including Allison Arnold, Sharon Evans, Ana-Maria Croicu, Peggy Moch, Kevin Yeomans, Barry Monk, Sutandra Sarkar, and Andrea Hendricks.
“Thank you so much for your hard work in putting this class together and teaching everything clearly online! I am so glad to be taking this class with you.”

“I think the content videos are a perfect length you teach everything that we need to know in the short time period! I love them!!”

“I definitely think it is an effective way of teaching and definitely working for me! I have not made below a 97 on any assignment :))”

Feedback
Design Team

“THE BEST WAY TO PREDICT THE FUTURE IS TO INVENT IT.”