01/14/2020

# REAL Curriculum Program Alignment Proposal

Department or School: Mathematics and Statistics Date: 04/27/2020

Degree type: ☐BS ☒BA ☐BBA ☐BSN ☐BM ☐BFA ☐BSW ☐Minor ☐Certificate

Program: BA in mathematics, traditional mathematics concentration

REAL Area Program Designation Sought (check all that apply): ☒ R ☐ E ☐ A ☐ L

Dept/School Contact: Eric P. Choate (echoate2@radford.edu)

BS/BA Requirements: BA language requirement

- Any degree program that fulfills a REAL area must include at least 9 unique credit hours for each area covered. At least 3 of these 9 credit hours must be at the 300 level or above
- A single major degree program may fulfill no more than three REAL areas for any one student, unless all four REAL areas are fulfilled by accreditation or licensure requirements.
- A single minor or certificate degree program may fulfill no more than two REAL areas.
- Degree program may cover up to two REAL areas using a single prefix.
- All courses documenting the coverage of a REAL area must fulfill all learning outcomes and be designated in that area.
- All courses that document fulfillment of a REAL area within a degree program of study are NOT required to be taught by the department/school. However, departments/schools are expected to formally communicate with other departments about reliance on and inclusion of courses in their degree program plans of study. Indicate this through signature of chair or director of the partnering department or school in the areas below.
- Departments or schools that seek to fulfill REAL areas must acknowledge assessment requirements for those areas. Assessment of degree seeking students is required to be conducted yearly by the department or school offering the degree program.
- If departments or schools want to use a menu of courses to fulfill a particular area, please duplicate the sections below for each REAL area and include information for each course included in the menu of options.
- Please save this file for submission as PROGRAM NAME_ProgramType.docx (Example: Criminal Justice_BS.docx)

By signing, the department/school acknowledges the above conditions and considerations:

| Dept/School Signature | Date: |
|---|---|

Official Program Description:

(This is revised April 2020.)

**Mathematics, B.A.**

The major is available with a choice of three concentrations: Applied Mathematics, Statistics, and Traditional Mathematics. Students who wish to pursue secondary education licensure in mathematics are advised to choose the Traditional Mathematics concentration.

**B.A. Requirements**
The Bachelor of Arts degree requires completion of the B.A. language requirements described here in this catalog.

**Major Core Courses (30-32 credits)**
All majors in mathematics must take:

- One of:
  - MATH 171 - Calculus and Analytic Geometry I
  - MATH 169 - Calculus I with Integrated Precalculus II
- MATH 172 - Calculus and Analytic Geometry II
- MATH 271 - Calculus and Analytic Geometry III
- MATH 260 - Introductory Linear Algebra
- MATH 300 - Mathematical Foundations
- MATH 430 - Advanced Calculus I
- MATH 431 - Advanced Calculus II
- STAT 301 - Probability and Statistics I
- One of:
  - ITEC 109 - Problem Solving and Programming
  - ITEC 120 - Principles of Computer Science I

Notes:
A grade of at least a "C" is required in MATH 172 and 271. Any departmental majors receiving credit for MATH 271 cannot subsequently receive credit for any 100-level mathematics course unless the course is required for their concentration.

**Concentrations**

**Applied Mathematics Concentration (25 credits)**

[Omitted]

**Statistics Concentration (18 credits)**

[Omitted]

**Traditional Mathematics Concentration (18 credits)**

- MATH 142 - Discrete Mathematics
- MATH 235 - Fundamentals of Geometry
- MATH 423 - Concepts of Abstract Algebra
- Nine additional credits from any 300- or 400-level mathematics or statistics course. Students pursuing Secondary Education Licensure must take MATH 321, MATH 335, and MATH 412.

Notes:
Students who wish to pursue Secondary Education Licensure must take MATH 321, MATH 335, and MATH 412. Additional courses in professional education are required for licensure. Students should contact the College of Education and Human Development for details.

**Electives**

Students should consult with their academic advisors in selecting elective courses to complete the 120 semester hours required for graduation.

**Total Credits Needed for Degree 120**

SCIENTIFIC AND QUANTITATIVE REASONING

| | |
|---|---|
| R Area:<br>Course Prefix: MATH<br>Course Number: 171<br>Course Title: Calculus and Analytic Geometry I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 85-100 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:169<br>Course Title: Calculus I with Integrated Precalculus II<br>Credit Hours:3<br>New course: ☐ Yes ☒ No<br>Revised course: ☒ Yes ☐ No<br><br>Projected student enrollment per academic year: 60-75 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:172<br>Course Title: Calculus and Analytic Geometry II<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 50-75 | Is this course required or an elective for your degree program? ☒ Required ☐ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: STAT<br>Course Number:301<br>Course Title: Probability and Statistics I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 30-40 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |

R Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: MATH 171 or 169.

| R Area:<br>Learning Goal: To apply scientific and quantitative reasoning to questions about the natural world, mathematics, or related areas. | |
|---|---|
| Learning Outcome 1: Students apply scientific and quantitative information to test problems and draw conclusions. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
| Learning Outcome 2:<br>Students evaluate the quality of data, methods, or inferences used to generate scientific and quantitative knowledge. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
| Additional information for REAL Council consideration:<br><br>For both quantitative and scientific reasoning, the Assessment Committee of the Department of Mathematics and Statistics will review the data from the assessment measures and work with the faculty in our department to determine the best course of action for continual improvement. We will also consider options for developing our own measures of quantitative reasoning. | |

Are existing material resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional material resources would be needed?

Are existing space resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional space resources would be needed?

Are existing human resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional human resources would be needed?

| | | |
|---|---|---|
| Department Curriculum Committee Recommendation: | Signature: | Date: |
| Chair/Dean on Behalf of Dept/School: | Signature: | Date: |
| College Curriculum Committee Approval: | Signature: | Date: |
| Dean/AVP Approval: | Signature: | Date: |
| REAL Council Recommendation: | Signature: | Date: |
| Faculty Senate Curriculum Committee Recommendation: | Signature: | Date: |
| Faculty Senate Approval: | Signature: | Date: |
| Provost Approval: | Signature: | Date: |

01/14/2020

# REAL Curriculum Program Alignment Proposal

Department or School: Mathematics and Statistics Date: 04/27/2020

Degree type: ☒BS ☐BA ☐BBA ☐BSN ☐BM ☐BFA ☐BSW ☐Minor ☐Certificate

Program: BS in mathematics, traditional mathematics concentration

REAL Area Program Designation Sought (check all that apply): ☒ R ☐ E ☐ A ☐ L

Dept/School Contact: Eric P. Choate (echoate2@radford.edu)

BS/BA Requirements: See below

- Any degree program that fulfills a REAL area must include at least 9 unique credit hours for each area covered. At least 3 of these 9 credit hours must be at the 300 level or above
- A single major degree program may fulfill no more than three REAL areas for any one student, unless all four REAL areas are fulfilled by accreditation or licensure requirements.
- A single minor or certificate degree program may fulfill no more than two REAL areas.
- Degree program may cover up to two REAL areas using a single prefix.
- All courses documenting the coverage of a REAL area must fulfill all learning outcomes and be designated in that area.
- All courses that document fulfillment of a REAL area within a degree program of study are NOT required to be taught by the department/school. However, departments/schools are expected to formally communicate with other departments about reliance on and inclusion of courses in their degree program plans of study. Indicate this through signature of chair or director of the partnering department or school in the areas below.
- Departments or schools that seek to fulfill REAL areas must acknowledge assessment requirements for those areas. Assessment of degree seeking students is required to be conducted yearly by the department or school offering the degree program.
- If departments or schools want to use a menu of courses to fulfill a particular area, please duplicate the sections below for each REAL area and include information for each course included in the menu of options.
- Please save this file for submission as PROGRAM NAME_ProgramType.docx (Example: Criminal Justice_BS.docx)

By signing, the department/school acknowledges the above conditions and considerations:

| Dept/School Signature | Date: |
|---|---|

Official Program Description:

(This is revised April 2020.)

**Mathematics, B.S.**

The major is available with a choice of three concentrations: Applied Mathematics, Statistics, and Traditional Mathematics. Students who wish to pursue secondary education licensure in mathematics are advised to choose the Traditional Mathematics concentration.

**B.S. Requirements**
B.S. requirements are listed with the respective concentrations.

**Major Core Courses (30-32 credits)**
All majors in mathematics must take:

- One of:
  - MATH 171 - Calculus and Analytic Geometry I
  - MATH 169 - Calculus I with Integrated Precalculus II
- MATH 172 - Calculus and Analytic Geometry II
- MATH 271 - Calculus and Analytic Geometry III
- MATH 260 - Introductory Linear Algebra
- MATH 300 - Mathematical Foundations
- MATH 430 - Advanced Calculus I
- MATH 431 - Advanced Calculus II
- STAT 301 - Probability and Statistics I
- One of:
  - ITEC 109 - Problem Solving and Programming
  - ITEC 120 - Principles of Computer Science I

Notes:
A grade of at least a "C" is required in MATH 172 and 271. Any departmental majors receiving credit for MATH 271 cannot subsequently receive credit for any 100-level mathematics course unless the course is required for their concentration.

**Concentrations**

**Applied Mathematics Concentration (25 credits)**

[Omitted]

**Statistics Concentration (18 credits)**

[Omitted]

**Traditional Mathematics Concentration (18 credits)**

- MATH 142 - Discrete Mathematics
- MATH 235 - Fundamentals of Geometry
- MATH 423 - Concepts of Abstract Algebra
- Nine additional credits from any 300- or 400-level mathematics or statistics course. Students pursuing Secondary Education Licensure must take MATH 321, MATH 335, and MATH 412.

**B.S. Requirement (6 credits)**
Six credits in

- Any physics course numbered 200 or above
- Any astronomy course
- Any biology course
- Any chemistry course
- Any geology course
- GEOS 130 – Physical Geography

- ITEC 120 or any ITEC course numbered 200 or above with the exception of ITEC 200 or 202;
- EDUC 467 Student Teaching
- Other courses approved by the department

Notes:
Students who wish to pursue Secondary Education Licensure must take MATH 321, MATH 335, and MATH 412. Additional courses in professional education are required for licensure. Students should contact the College of Education and Human Development for details.

**Electives**

Students should consult with their academic advisors in selecting elective courses to complete the 120 semester hours required for graduation.

**Total Credits Needed for Degree 120**

SCIENTIFIC AND QUANTITATIVE REASONING

| | |
|---|---|
| R Area:<br>Course Prefix: MATH<br>Course Number: 171<br>Course Title: Calculus and Analytic Geometry I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 85-100 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:169<br>Course Title: Calculus I with Integrated Precalculus II<br>Credit Hours:3<br>New course: ☐ Yes ☒ No<br>Revised course: ☒ Yes ☐ No<br><br>Projected student enrollment per academic year: 60-75 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:172<br>Course Title: Calculus and Analytic Geometry II<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 50-75 | Is this course required or an elective for your degree program? ☒ Required ☐ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: STAT<br>Course Number:301<br>Course Title: Probability and Statistics I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 30-40 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |

R Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: MATH 171 or 169.

| R Area:<br>Learning Goal: To apply scientific and quantitative reasoning to questions about the natural world, mathematics, or related areas. | |
|---|---|
| Learning Outcome 1: Students apply scientific and quantitative information to test problems and draw conclusions. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
| Learning Outcome 2:<br>Students evaluate the quality of data, methods, or inferences used to generate scientific and quantitative knowledge. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
| Additional information for REAL Council consideration:<br><br>For both quantitative and scientific reasoning, the Assessment Committee of the Department of Mathematics and Statistics will review the data from the assessment measures and work with the faculty in our department to determine the best course of action for continual improvement. We will also consider options for developing our own measures of quantitative reasoning. | |

Are existing material resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional material resources would be needed?

Are existing space resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional space resources would be needed?

Are existing human resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional human resources would be needed?

| | | |
|---|---|---|
| Department Curriculum Committee Recommendation: | Signature: | Date: |
| Chair/Dean on Behalf of Dept/School: | Signature: | Date: |
| College Curriculum Committee Approval: | Signature: | Date: |
| Dean/AVP Approval: | Signature: | Date: |
| REAL Council Recommendation: | Signature: | Date: |
| Faculty Senate Curriculum Committee Recommendation: | Signature: | Date: |
| Faculty Senate Approval: | Signature: | Date: |
| Provost Approval: | Signature: | Date: |

01/14/2020

# REAL Curriculum Program Alignment Proposal

Department or School: Mathematics and Statistics Date: 04/27/2020

Degree type: ☐BS ☐BA ☐BBA ☐BSN ☐BM ☐BFA ☐BSW ☒Minor ☐Certificate

Program: Minor in statistics

REAL Area Program Designation Sought (check all that apply): ☒ R ☐ E ☐ A ☐ L

Dept/School Contact: Eric P. Choate (echoate2@radford.edu)

BS/BA Requirements: N/A

- Any degree program that fulfills a REAL area must include at least 9 unique credit hours for each area covered. At least 3 of these 9 credit hours must be at the 300 level or above
- A single major degree program may fulfill no more than three REAL areas for any one student, unless all four REAL areas are fulfilled by accreditation or licensure requirements.
- A single minor or certificate degree program may fulfill no more than two REAL areas.
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- Please save this file for submission as PROGRAM NAME_ProgramType.docx (Example: Criminal Justice_BS.docx)

By signing, the department/school acknowledges the above conditions and considerations:

| Dept/School Signature | Date: |
|---|---|

Official Program Description:

**Mathematics Minor**

**(16-19 Semester Hours)**

- One of:
  - MATH 171 Calculus and Analytic Geometry I
  - MATH 169 Calculus I with Integrated Precalculus II
- MATH 172 Calculus and Analytic Geometry II
- MATH 260 Introductory Linear Algebra
- One of:
  - MATH 346 Differential Equations
  - STAT 301 Probability and Statistics I
- Three credits from:
  - MATH 271 Calculus and Analytic Geometry III
  - Any 300- or 400-level mathematics or statistics course.

SCIENTIFIC AND QUANTITATIVE REASONING

| | |
|---|---|
| R Area:<br>Course Prefix: MATH<br>Course Number: 171<br>Course Title: Calculus and Analytic Geometry I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 85-100 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:169<br>Course Title: Calculus I with Integrated Precalculus II<br>Credit Hours:3<br>New course: ☐ Yes ☒ No<br>Revised course: ☒ Yes ☐ No<br><br>Projected student enrollment per academic year: 60-75 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:172<br>Course Title: Calculus and Analytic Geometry II<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 50-75 | Is this course required or an elective for your degree program? ☒ Required ☐ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number: 346<br>Course Title: Calculus and Analytic Geometry II<br>Credit Hours: 3<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 50-75 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: STAT<br>Course Number:301<br>Course Title: Probability and Statistics I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 30-40 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: MATH 171 or 169. | |

| R Area:<br>Learning Goal: To apply scientific and quantitative reasoning to questions about the natural world, mathematics, or related areas. | |
|---|---|
| Learning Outcome 1: Students apply scientific and quantitative information to test problems and draw conclusions. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
| Learning Outcome 2:<br>Students evaluate the quality of data, methods, or inferences used to generate scientific and quantitative knowledge. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
| Additional information for REAL Council consideration:<br><br>For both quantitative and scientific reasoning, the Assessment Committee of the Department of Mathematics and Statistics will review the data from the assessment measures and work with the faculty in our department to determine the best course of action for continual improvement. We will also consider options for developing our own measures of quantitative reasoning. | |

Are existing material resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional material resources would be needed?

Are existing space resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional space resources would be needed?

Are existing human resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional human resources would be needed?

| | | |
|---|---|---|
| Department Curriculum Committee Recommendation: | Signature: | Date: |
| Chair/Dean on Behalf of Dept/School: | Signature: | Date: |
| College Curriculum Committee Approval: | Signature: | Date: |
| Dean/AVP Approval: | Signature: | Date: |
| REAL Council Recommendation: | Signature: | Date: |
| Faculty Senate Curriculum Committee Recommendation: | Signature: | Date: |
| Faculty Senate Approval: | Signature: | Date: |
| Provost Approval: | Signature: | Date: |

01/14/2020

# REAL Curriculum Program Alignment Proposal

Department or School: Mathematics and Statistics Date: 04/27/2020

Degree type: ☐BS ☐BA ☐BBA ☐BSN ☐BM ☐BFA ☐BSW ☒Minor ☐Certificate

Program: Minor in statistics

REAL Area Program Designation Sought (check all that apply): ☒ R ☐ E ☐ A ☐ L

Dept/School Contact: Eric P. Choate (echoate2@radford.edu)

BS/BA Requirements: N/A

- Any degree program that fulfills a REAL area must include at least 9 unique credit hours for each area covered. At least 3 of these 9 credit hours must be at the 300 level or above
- A single major degree program may fulfill no more than three REAL areas for any one student, unless all four REAL areas are fulfilled by accreditation or licensure requirements.
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By signing, the department/school acknowledges the above conditions and considerations:

| Dept/School Signature | Date: |
|---|---|

Official Program Description:

Statistics Minor (17-18 credit hours)

- One of the following:
    - MATH 171 - Calculus and Analytic Geometry I, or
    - MATH 169 - Calculus I with Integrated Precalculus II
- MATH 172 - Calculus and Analytic Geometry II
- STAT 301 - Probability and Statistics I
- STAT 302 - Probability and Statistics II
- Three additional hours in 300- or 400-level statistics courses.

SCIENTIFIC AND QUANTITATIVE REASONING

| | |
|---|---|
| R Area:<br>Course Prefix: MATH<br>Course Number: 171<br>Course Title: Calculus and Analytic Geometry I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 85-100 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:169<br>Course Title: Calculus I with Integrated Precalculus II<br>Credit Hours:3<br>New course: ☐ Yes ☒ No<br>Revised course: ☒ Yes ☐ No<br><br>Projected student enrollment per academic year: 60-75 | Is this course required or an elective for your degree program? ☐ Required ☒ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: MATH<br>Course Number:172<br>Course Title: Calculus and Analytic Geometry II<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 50-75 | Is this course required or an elective for your degree program? ☒ Required ☐ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Area:<br>Course Prefix: STAT<br>Course Number:301<br>Course Title: Probability and Statistics I<br>Credit Hours: 4<br>New course: ☐ Yes ☒ No<br>Revised course: ☐ Yes ☒ No<br><br>Projected student enrollment per academic year: 30-40 | Is this course required or an elective for your degree program? ☒ Required ☐ Elective<br>Is this course offered within your dept/school? ☒ Yes ☐ No |
| R Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: MATH 171 or 169. | |

| R Area:<br>Learning Goal: To apply scientific and quantitative reasoning to questions about the natural world, mathematics, or related areas. | |
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| Learning Outcome 1: Students apply scientific and quantitative information to test problems and draw conclusions. | Quantitative Measure: Students will take the quantitative measure created for the REAL studies R minor.<br><br>Scientific Measure: Students will take the scientific measure created for the REAL studies R minor. |
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| Additional information for REAL Council consideration:<br><br>For both quantitative and scientific reasoning, the Assessment Committee of the Department of Mathematics and Statistics will review the data from the assessment measures and work with the faculty in our department to determine the best course of action for continual improvement. We will also consider options for developing our own measures of quantitative reasoning. | |

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Are existing space resources adequate to support this program alignment proposal?
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Are existing human resources adequate to support this program alignment proposal?
☒ Yes ☐ No If not, what additional human resources would be needed?

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| Department Curriculum Committee Recommendation: | Signature: | Date: |
| Chair/Dean on Behalf of Dept/School: | Signature: | Date: |
| College Curriculum Committee Approval: | Signature: | Date: |
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