

REAL Curriculum Program Alignment Proposal

Department or School: Biology

Date: Enter date

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

Program: Biology major, General Biology concentration

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

Dept/School Contact: Justin Anderson janderson152@radford.edu

BS/BA Requirements: CHEM301 & CHEM302

- 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:
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Official Program Description:**Biology, B.S.**[General Biology Concentration](#)

All requirements for a biology major are outlined below. All majors must complete the same Required Core courses in Biology, Chemistry, Mathematics, and Statistics, and must also complete additional requirements and/or electives in one of two concentrations.

Core Curriculum Requirements (43-45 credits)

All Biology majors are required to take the following courses and are advised to take them as part of the Core Curriculum requirements:

[CHEM 111 - General Chemistry I](#)

[STAT 219 - Statistics for Biology](#)

[MATH 119 - Mathematics for Biology](#) or

[MATH 138 - Precalculus](#) or

[MATH 168 - Calculus I with Integrated Precalculus I](#) or

[MATH 171 - Calculus and Analytic Geometry I](#)

Required Biology Courses (14 credits)

[BIOL 131 - Ecology and Adaptation](#)

[BIOL 132 - Biology of Cells and Microorganisms](#)

[BIOL 231 - Genetics, Evolution and Development](#)

[BIOL 160 - Introductory Seminar in Biology](#)

Note(s):

All freshman Biology majors must register for [BIOL 160](#) in their first or second semester.

In the General Biology Concentration transfer students, and any other students, who do not take [BIOL 160](#) must take either an additional [BIOL 460](#) or one additional Biology elective at the 300 or 400 level of equal or greater credit hours (excluding [BIOL 310](#), [BIOL 311](#), [BIOL 322](#), [BIOL 334](#), [BIOL 491](#), [BIOL 492](#) and [BIOL 495](#)). Students in the Medical Laboratory Sciences Concentration who do not take [BIOL 160](#) must take [BIOL 460](#) instead.

Biology majors must complete the four Core courses, [BIOL 131](#), [BIOL 132](#), [BIOL 231](#) and [BIOL 232](#) with grades of C or better before registering for any 300- or 400-level Biology electives. (Exception: Students in the Medical Laboratory Sciences Concentration do not need to take [BIOL 232](#).)

Students are allowed only one repeat or retake for each of the four Core courses, [BIOL 131](#), [BIOL 132](#), [BIOL 231](#) and [BIOL 232](#).

Students who change their majors to Biology may substitute [BIOL 105](#) for [BIOL 132](#). Transfer students who transfer in credit for [BIOL 105](#) may similarly substitute the transferred course for [BIOL 132](#). Transfer students who

transfer in BIOL 102 from a Virginia Community College, or an equivalent course from another institution, may substitute that course for [BIOL 232](#).

All Biology (BIOL) courses that have prerequisites, with the exception of those cross-listed with Chemistry (CHEM), require a grade of “C” or better in all courses listed as prerequisites for admission to the course, unless otherwise stated.

Other Courses Required for the Major (22 credits)

[CHEM 111 - General Chemistry I](#)

[CHEM 112 - General Chemistry II](#)

[CHEM 301 - Organic Chemistry I](#)

[CHEM 302 - Organic Chemistry II](#)

[STAT 219 - Statistics for Biology](#)

[MATH 119 - Mathematics for Biology](#) *

Note(s):

*Qualified students may substitute [MATH 138](#), [MATH 168](#), or [MATH 171](#).

Concentration (26-36 credits)

All majors must choose one of the two concentrations described below and fulfill all additional requirements for their chosen concentration.

B.S. Requirements (8 credits)

All Biology majors are expected to complete [CHEM 301:CHEM 302](#) (8 hrs.) to fulfill their Bachelor of Science degree requirement.

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

Graduation Requirements

To graduate with a major in biology a student must attain an overall major grade point average of 2.0 or higher.

Major GPA is calculated by using BIOL 131, BIOL 132, BIOL 160, all biology courses 200-level or higher, CHEM 471:472 (cross-listed as BIOL 471:472) all courses outside of biology used as electives (see electives below), and any course used as an elective by academic petition.

Concentrations

General Biology Concentration

The General Biology Concentration provides students with a strong, broadly-based foundation in biology. This concentration is appropriate for all Biology majors, including those students planning to enter graduate school and those planning to seek teacher licensure.

Additional Required Biology Courses (6 credits)

[BIOL 232 - Organismal Biology](#)

[BIOL 460 - Advanced Seminar in Biology](#)

Electives (26-31 credits)

Students must select either 26 credits of Biology elective courses or 22 credits of Biology elective courses and 6-9 credits hours of approved non-biology courses listed below. Biology electives may be chosen from any of the Biology courses numbered 200 or higher except those listed as not counting for the Biology major (e.g., [BIOL 310](#), [BIOL 311](#), [BIOL 322](#), [BIOL 334](#)). Students are advised to consider all the department's electives and to choose those most appropriate to their goals.

The following approved non-biology courses may be used to fulfill 6-9 credits of Biology electives, in combination with 22 credits of BIOL electives:

[PHYS 111:112](#) General Physics (4:4) or [PHYS 221:222](#) Physics (4:4)

[CHEM 478](#) Medicinal Chemistry

[CRJU 382](#) Wildlife Crime and Conservation and Law Enforcement

[ECON 375](#)* Environmental Economics

[ENGL 306](#) Professional Writing

[ENGL 406](#) Advanced Technical Writing

[ENGL 454](#) Literature and the Environment

[GEOS 241](#)* Environmental Regulation

[GEOS 250](#) Introduction to GIS

[GEOS 315](#) Intermediate GIS

[GEOS 335](#) Biogeography

[GEOL 365](#) Oceanography

[GEOL 408](#)* Spatial Data Applications in Geology

[NURS 321](#) Pathophysiology

[NUTR 300](#) Medical Terminology

[PSYC 378](#)* Brain and Behavior

[SOCY 370](#)* Environmental Sociology

*These courses have prerequisites which do not count towards the Biology major, but may satisfy Core elective requirements.

Teaching Licensure

A biology major in the General Biology Concentration seeking teacher licensure should contact the College of Education and Human Development for information concerning the necessary courses. Students not majoring in biology who desire an endorsement to teach biology in secondary schools must complete 32 semester hours of biology coursework, including [BIOL 131](#):[BIOL 132](#):[BIOL 231](#):[BIOL 232](#). Preparation in chemistry, physics, and mathematics is also recommended. Students should contact the College of Education and Human Development to determine the most appropriate courses for this option.

SCIENTIFIC AND QUANTITATIVE REASONING

<p>R Area: Course Prefix: BIOL Course Number: 105 Course Title: Biology for Health Science Majors Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 150</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Area: Course Prefix: BIOL Course Number: 131 Course Title: Ecology & Adaptation Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 150</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input type="checkbox"/> Every academic year <input type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Area: Course Prefix: BIOL Course Number: 132 Course Title: Biology of Cells & Microorganisms Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 150</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Area: Course Prefix: CHEM Course Number: 301 Course Title: Organic Chemistry I Credit Hours: 4</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input checked="" type="checkbox"/> Every academic year <input type="checkbox"/> Every semester <input type="checkbox"/> Every other year</p>

New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 200	<input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
R Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: BIOL103, BIOL104, BIOL105, BIOL131, BIOL132	
R Area: 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.	Description of learning outcome assessment plan: A representative sample of our graduating seniors will be assessed in a 300- or 400-level R-designated course. The faculty member on record for the course will apply a department-designed, quantitative rubric per senior to determine whether or not the student is at introductory-, intermediate-, or mastery-level. Our program will be deemed successful if 70% of the seniors sampled are at the mastery-level.
Learning Outcome 2: Students evaluate the quality of data, methods, or inferences used to generate scientific and quantitative knowledge.	Description of learning outcome assessment plan: The faculty advisors will apply the quantitative, ePortfolio rubric to all of their graduating seniors to determine whether or not the student's ePortfolio is underdeveloped, developing, developed, or highly developed regarding this LO. Our program will be deemed successful if 70% of the graduating seniors score at least 42 out of 56 on the ePortfolios, which is equivalent to a developed ePortfolio.
Additional information for REAL Council consideration:	

APPLIED LEARNING

L Area: Course Prefix: BIOL Course Number: 231 Course Title: Genetics, Evolution, & Development Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 150	Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below. Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below) Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
L Area: Course Prefix: BIOL Course Number: 232 Course Title: Organismal Biology Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 100	Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below. Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below) Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
L Area: Course Prefix: CHEM Course Number: 302	Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.

Course Title: Organic Chemistry II Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 200	Course Rotation: <input type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below) Intended Frequency: <input type="checkbox"/> Every academic year <input type="checkbox"/> Every semester <input checked="" type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
L Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: BIOL231, BIOL232	

L Area: Learning Goal: To explore professional practice through the application of knowledge, skills, and critical reflection.	
Learning Outcome 1: Students apply acquired knowledge and skills to develop professional identity or professional practice.	Description of learning outcome assessment plan: The faculty advisors will apply the quantitative, ePortfolio rubric to all of their graduating seniors to determine whether or not the student's ePortfolio is underdeveloped, developing, developed, or highly developed regarding this LO. Our program will be deemed successful if 70% of the graduating seniors score at least 42 out of 56 on the ePortfolios, which is equivalent to a developed ePortfolio.
Learning Outcome 2: Students critically reflect on their learning, abilities, experiences, or role within professional contexts.	Description of learning outcome assessment plan: A representative sample of our graduating seniors will be assessed in a 300- or 400-level course that provides an authentic research experience. The faculty member on record for the course will apply a department-designed, quantitative rubric per senior to determine whether or not the student is at introductory-, intermediate-, or mastery-level. Our program will be deemed successful if 70% of the seniors sampled are at the mastery-level.
Additional information for REAL Council consideration: We plan to have a biennial workshop that recalibrates and standardizes the scoring to ensure that faculty are scoring uniformly. During this workshop, we will collaboratively score an introductory-, intermediate-, or mastery-level research project using the rubric. Similarly, we will collaboratively score an underdeveloped, developing, developed, and highly developed ePortfolio using the rubric. We will clarify/modify the rubrics as needed increase the ease their use.	

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:

REAL Curriculum Program Alignment Proposal

Department or School: Biology

Date: Enter date

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

Program: Biomedical Sciences major

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

Dept/School Contact: Justin Anderson janderson152@radford.edu

BS/BA Requirements: CHEM301 & CHEM302

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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:
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Official Program Description:**Core Curriculum Requirements (43-45 credits)**

All Biomedical Sciences majors are required to take the following courses and are advised to take them as part of the C

- [CHEM 111 - General Chemistry I](#)
- [CHEM 112 - General Chemistry II](#)
- [MATH 168 - Calculus I with Integrated Precalculus I](#)
- [MATH 169 - Calculus I with Integrated Precalculus II](#)
- [PHYS 111 - General Physics](#) or [PHYS 221 - Physics](#)
- [PHYS 112 - General Physics](#) or [PHYS 222 - Physics](#)
- [PSYC 121 - Introduction to Psychology](#)
- [SOCY 110 - Introduction to Sociology](#)
- [STAT 219 - Statistics for Biology](#)

Additional Required Courses (16 credits)

- [CHEM 301 - Organic Chemistry I](#)
- [CHEM 302 - Organic Chemistry II](#)

Required Biology Courses (30 credits)

- [BIOL 131 - Ecology and Adaptation](#)
- [BIOL 132 - Biology of Cells and Microorganisms](#)
- [BIOL 160 - Introductory Seminar in Biology](#)
- [BIOL 232 - Organismal Biology](#)
- [BIOL 231 - Genetics, Evolution and Development](#)
- [BIOL 471 - Biochemistry I](#)
- [BIOL 474 - Biochemistry Laboratory](#)
- [BIOL 305 - Introduction to Scientific Literature](#)
- [BIOL 472 - Biochemistry II](#)
- [BIOL 475 - Biochemistry Laboratory II](#)
- [BIOL 460 - Advanced Seminar in Biology](#)

300-400 Level Biology Courses (18 credits)

All Biomedical Sciences majors must take 18 credits of 300-400 level Biology courses. Out of the 18 credit hours, 14 credit hours must be from the following list:

- [BIOL 300 - Pathophysiology](#)
- [BIOL 309 - Physiological Foundations Pharmacology](#)
- [BIOL 310 - Human Structure and Function I](#)
- [BIOL 311 - Human Structure and Function II](#)
- [BIOL 314 - Gross Anatomy I](#)
- [BIOL 315 - Gross Anatomy II](#)
- [BIOL 334 - Microbiology](#)
- [BIOL 350 - Comparative Anatomy](#)
- [BIOL 351 - Comparative Animal Physiology](#)
- [BIOL 365 - Integration of Science Foundations](#)
- [BIOL 405 - Histology](#)
- [BIOL 409 - Virology](#)
- [BIOL 412 - Immunology](#)
- [BIOL 432 - The Eukaryotic Cell](#)
- [BIOL 433 - Cancer Biology](#)
- [BIOL 450 - Molecular Biology](#)
- [BIOL 477 - Neuroscience](#)
- [BIOL 481 - Special Topics in Biology](#)
- [BIOL 491 - Directed Study and Research](#)
- [BIOL 492 - Undergraduate Research](#)

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

<p>R Area: Course Prefix: BIOL Course Number: 105 Course Title: Biology for Health Science Majors Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Projected student enrollment per academic year: 150</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Area: Course Prefix: BIOL Course Number: 131 Course Title: Ecology & Adaptation Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Projected student enrollment per academic year: 150</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Area: Course Prefix: BIOL Course Number: 132 Course Title: Biology of Cells & Microorganisms Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Projected student enrollment per academic year: 150</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Area: Course Prefix: CHEM Course Number: 301 Course Title: Organic Chemistry I Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Projected student enrollment per academic year: 200</p>	<p>Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below.</p> <p>Course Rotation: <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below)</p> <p>Intended Frequency: <input checked="" type="checkbox"/> Every academic year <input type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other</p> <p>Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:</p>
<p>R Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: BIOL131, BIOL132</p>	
<p>R Area: Learning Goal: To apply scientific and quantitative reasoning to questions about the natural world, mathematics, or related areas.</p>	

Learning Outcome 1: Students apply scientific and quantitative information to test problems and draw conclusions.	Description of learning outcome assessment plan: A representative sample of our graduating seniors will be assessed in a 300- or 400-level R-designated course. The faculty member on record for the course will apply a department-designed, quantitative rubric per senior to determine whether or not the student is at introductory-, intermediate-, or mastery-level. Our program will be deemed successful if 70% of the seniors sampled are at the mastery-level.
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Additional information for REAL Council consideration: Note that the catalog currently states that BIOL310 and BIOL311 are required. This is a legacy of the merger, and we will be working on cleaning up catalog descriptions in the coming year. We have included our BIOL350 and BIOL410 anatomy courses, which have only been offered on the Radford campus to date and are required of science majors on this campus.	

APPLIED LEARNING

L Area: Course Prefix: BIOL Course Number: 231 Course Title: Genetics, Evolution, & Development Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 150	Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below. Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below) Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
L Area: Course Prefix: BIOL Course Number: 232 Course Title: Organismal Biology Credit Hours: 4 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 100	Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below. Course Rotation: <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below) Intended Frequency: <input type="checkbox"/> Every academic year <input checked="" type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
L Area: Course Prefix: BIOL Course Number: 471 Course Title: Biochemistry I Credit Hours: 3 New course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Revised course: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Projected student enrollment per academic year: 85	Is this course required or an elective for your degree program? <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective Is this course offered within your dept/school? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No If no, collaborating dept/school must also complete the remaining elements, and must sign below. Course Rotation: <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring <input type="checkbox"/> Intersession <input type="checkbox"/> Other (Explain below) Intended Frequency: <input checked="" type="checkbox"/> Every academic year <input type="checkbox"/> Every semester <input type="checkbox"/> Every other year <input type="checkbox"/> At least once every three years <input type="checkbox"/> Other Signature of collaborating chair/director indicating acknowledgement for inclusion and designation if not offered in dept/school:
L Designated Course Required within the Program of Study Approved for Inclusion in the General Education Coursework: BIOL231, BIOL232	
L Area:	

Learning Goal: To explore professional practice through the application of knowledge, skills, and critical reflection.	
Learning Outcome 1: Students apply acquired knowledge and skills to develop professional identity or professional practice.	Description of learning outcome assessment plan: The faculty advisors will apply the quantitative, ePortfolio rubric to all of their graduating seniors to determine whether or not the student's ePortfolio is underdeveloped, developing, developed, or highly developed regarding this LO. Our program will be deemed successful if 70% of the graduating seniors score at least 42 out of 56 on the ePortfolios, which is equivalent to a developed ePortfolio.
Learning Outcome 2: Students critically reflect on their learning, abilities, experiences, or role within professional contexts.	Description of learning outcome assessment plan: A representative sample of our graduating seniors will be assessed in a 300- or 400-level course that provides an authentic research experience. The faculty member on record for the course will apply a department-designed, quantitative rubric per senior to determine whether or not the student is at introductory-, intermediate-, or mastery-level. Our program will be deemed successful if 70% of the seniors sampled are at the mastery-level.
Additional information for REAL Council consideration: We plan to have a biennial workshop that recalibrates and standardizes the scoring to ensure that faculty are scoring uniformly. During this workshop, we will collaboratively score an introductory-, intermediate-, or mastery-level research project using the rubric. Similarly, we will collaboratively score an underdeveloped, developing, developed, and highly developed ePortfolio using the rubric. We will clarify/modify the rubrics as needed increase the ease their use.	

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: