



PROGRAM REVIEW DOCUMENT

<http://epsb-caep.eku.edu/program-review>

Name of Program:	Biological Science (Initial - Undergraduate)
Certification Level:	8 - 12
Delivery Modes:	Face-to-face, Hybrid
Catalog URL:	http://catalogs.eku.edu/sites/catalogs.eku.edu/files/files/2016-17%20Undergraduate%20Catalog_EKU.pdf (p. 244*)
Program Codes:	4050 3 3029
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**Curriculum changes approved at the University replacing SED 402 (2) with EDC 300 (3) and reducing the credit hours for CED 100 and CED 200 to 0 may not be reflected in the 2016-2017 catalog.*

I. Quality Assurance

The EPP is currently in the process of refining our Quality Assurance System to meet CAEP accreditation standards. The EPP has undergone an annual review process of goal setting, data collection, review and analysis of data including annual and three-year trend data (where program admission numbers permit), reporting results, and identifying and meaningful change for program improvements for decades. Several years ago, Eastern Kentucky University implemented an Assurance of Learning Day campus wide, which required all programs at the University to engage in this process of analyzing data, reporting results, and determining changes needed to improve candidate performance and achievement. Program reports produced as a result are reviewed by the University's Academic Planning and Assessment Committee and feedback is provided to the administrator for each program.

The data collected by the EPP for the process described above is aligned to the assessment areas required for annual reporting to EPSB. For those EPP wide assessments that are not proprietary, the process of establishing construct and content validity and reliability is underway. Each EPP created Key Assessment is developed by a panel of experts using applicable professional standards with input from P-12 partners. In this way, construct validity is established. Then, the EPP utilizes the Lawshe method for ensuring content validity by having a panel of experts, including P-12 partners, review the assessment and determine items on the scoring guide that are viewed as essential for the particular assessment. A content validity ratio (CVR) is established by utilizing a formula ($CVR = \frac{ne - N/2}{N/2}$ where ne is the number of experts who mark an item as essential and N is the number of experts on the panel) to determine the extent to which experts agree that an item is essential. Items with a CVR score of .80 or higher are considered essential. Panel experts discuss each item with a CVR value less than .80 to determine whether the item needs to be deleted or the assessment needs to be revised to clarify the alignment to the item. Then, the assessments are revised and reevaluated using the same approach ensuring that each assessment item retained has attained a CVR of .80 or higher. This process for establishing content validity is undertaken each time an assessment is revised.

The process of establishing reliability is undertaken each semester, as necessary, to ensure that all clinical faculty utilizing the assessment to evaluate candidate performance have interrater agreement. Initially, all faculty who score a given assessment undergo interrater agreement and calibration training. This process includes each faculty member individually utilizing the assessment to score a common candidate work sample. Next, a facilitator records each individual faculty member's scores on a score sheet without discussion. A value of 1 is entered for each item where there is 100% agreement among faculty on the score. A value of 0 is entered for each item where faculty scored the sample at different levels (where agreement is not 100%). Then, the faculty engage in a discussion explaining why each individual scored each item as they did. For any item with an interrater agreement value of 0, the faculty reach a consensus on what the score should be given the

scoring criteria. Then they establish a “rule” for grading for that item to ensure that everyone grading that item knows the appropriate score and how to grade on that item. The rules are recorded and distributed to each faculty member. Then, the process is repeated using a new common student work sample until the raters reach a minimum of 85% agreement on the assessment ratings for the assessment. To calculate the *percentage of agreement*, the number of times the raters agree on the same data item is summed and divided by the total number of data items. Following the interrater agreement and calibration training, an interrater reliability session is conducted with each assessment. This process involves having each faculty member who scores the assessment, individually score a common student work sample. Scores assigned by each faculty member are recorded by the facilitator and the resulting data is used to establish a reliability coefficient (using Cohen’s Kappa Statistic or other acceptable process determined by researcher) for the assessment. In this way, reliability is established for each assessment.

The program reports generated during the process described above are aligned to the assessment areas and program reports required by EPSB and the EPP wide reports required by CAEP. While the EPP has made progress in refining the processes used for program assessment to meet CAEP requirements, further refinements to the Quality Assurance System are necessary to meet all of the CAEP standards.

II. Program Experiences

- a. Program Courses/Experiences– The initial teacher preparation programs at EKU share a common professional core of courses designed to provide candidates with the foundational knowledge upon which to build professional knowledge, dispositions, and skills necessary for success in their specific disciplines and grade levels. These courses consist of both professional education courses and clinical courses wherein candidates practice the skills and concepts learned in the professional courses in clinical settings. See Professional Core Course Inventory at <http://epsb-caep.eku.edu/program-review>.

Woven throughout the professional and clinical courses are five professional elements that program faculty have identified as central to effective teaching. These are personalized learning/differentiation, cultural competency, technology, ethics/code of conduct, and dispositions. The elements are intentionally taught throughout the courses in the professional core as shown in the attached chart. See Professional Core Elements at <http://epsb-caep.eku.edu/program-review>.

Each individual program includes core content courses designed to provide candidates with the knowledge they need to teach effectively in the specific discipline and grade level for which they are seeking certification. The Department of Biological Sciences has undertaken critical review of its core course over the last several years with particular emphasis on improving problem-solving and critical thinking skills of its candidates. The introductory biology courses of BIO 111 (Cellular and Molecular Biology) and BIO 112 (Ecology and Evolution) provide candidates with a hands-on approach to learning

Eastern Kentucky University College of Education Biological Science Initial/UG science. In addition to emphasizing the scientific method, candidates in these courses are taught how to write scientific papers using a sequence of tiered assignments. A continuing effort is creating instructional/reference video modules that specifically target the writing process as utilized in science. BIO 315 (Genetics) and BIO 320 (Microbiology) courses use the inquiry based teaching approach. Candidates are challenged in these courses to work in small groups and problem solve. Instructors in these courses update problems and modules each semester. BIO 316 (Ecology), BIO 318 (Botany) and BIO 319 (Zoology) are content based and help the candidates develop a better understanding of the world around them. Therefore, our Biology Teaching program attempts to make the candidate a well-rounded individual in Biological Sciences – emphasizing both biological content and reading, writing, and critical thinking skills. The content core for the Biological Sciences 8 - 12 teaching program is included in the Biology Course Inventory chart. See Biology Course Inventory under Sciences at <http://epsb-caep.eku.edu/program-review>.

- i. Field/Clinical Experiences (16 KAR 5:040 components addressed as appropriate)
 1. Pre-student teaching candidates have specific clinical experience elements embedded in course requirements throughout the program (16 KAR 5:040 Section 3). The required pre-student teaching clinical courses are CED 100, 200, 300, 400, and 450, each paired with professional education core courses and aligned to the required experiences denoted in 16 KAR 5:040 Section 3 a – g. Candidate engagement in required experiences are recorded in KFETS. These experiences are tracked and monitored by clinical educators through the EPSB Kentucky Field Experience Tracking System each semester under the direction of the Office of Clinical Experiences. CED 150 is identified for candidates who transfer an equivalent to a professional education core course.

The culminating clinical experiences occur in CED 499, The Professional Semester. The candidates are in clinical classrooms from the time they begin their professional education coursework. Candidates progressively increase instructional responsibilities throughout their clinical experiences. At this point in their professional career, The Professional Semester, student teachers begin teaching on the very first day of school. Candidates begin their semester on the same day as their Cooperating Teacher, prior to the first actual day of school for students. As a result, candidates experience all activities associated with the opening of the school year, such as professional development, open house, long range planning, and preparing the classroom. Student teachers complete a Student Teacher Work Sample including four required learner tasks during the professional semester. The first learner task is the Professional Growth Plan. Candidates begin with the self-evaluation, using the Professional Growth and Effectiveness System for Teachers (PGES), building upon their reflections and professional development priorities identified in Residency 1 (methods). Student teachers self-assess and establish professional goals for improvement. The Professional Growth Plan is a living document and, throughout the duration of

the Professional Semester, will be reviewed by the Cooperating Teacher and University Supervisor as well as the student teacher. The second learner task includes the formal lesson plans observed by the University Supervisor. A minimum of four lessons are observed by the University Supervisor over the duration of the Professional Semester. The third learner task is the case study to Assess, Diagnose, Prescribe, Monitor, and Reflect on student learning and instructional effectiveness. The student teacher collects baseline data, sets student growth goals, designs and implements instruction, monitors student progress, and reflects on student learning and instructional effectiveness. The student teacher uses the Assess, Diagnose and Prescribe template for this project, which includes a specific behavior plan and instructional plan for improvement. The fourth learner task includes the unit plans, implementation, and reflection task. The student teacher designs and implements two instructional units that incorporate technology and differentiation of instruction. The student teacher administers a pre-assessment, uses this data to edit the unit, and teaches these two units. One unit will be selected for submission in the Student Teacher Work Sample key assessment platform (TaskStream). Throughout the Professional Semester, student teachers are required to administer a student voice survey and provide the copies to the Office of Clinical Experiences. Student teachers keep a professional log of all outside activities including committees, PLCs, and school or district involvement.

Note: KTIP is the culminating experience for Option 6 candidates.

2. The clinical courses and their associated professional core courses are illustrated in the Clinical Experiences chart. See the Clinical Experiences Chart at <http://epsb-caep.eku.edu/program-review>.
- ii. Kentucky Performance Standards
1. Kentucky Teacher Standards (KTS) – All initial teacher preparation programs are aligned to the Kentucky Teacher Standards-Initial as indicated in the Program Assessment Charts for each program and program syllabi for professional, clinical, and content core courses. Syllabi also indicate alignment to the appropriate SPA standards. Program assessments, including the key assessments that are collected EPP wide in the professional core and clinical courses taken by all candidates, measure performance on indicators directly aligned to the Kentucky Teacher Standards-Initial, CAEP, and InTASC standards. This alignment is shown in the Secondary Program Review Assessment Chart. Please see Secondary Program Review Assessments at <http://epsb-caep.eku.edu/program-review>.
 2. Kentucky Academic Standards (KAS) - Content-focused and pedagogy courses are aligned with both PRAXIS content expectations and Kentucky Academic Standards. Faculty across the university who prepare our teacher candidates have also had training related to the Kentucky Academic Standards. From an instructional point

of view, this prepares faculty to embed content and instruction appropriate for developing candidates' proficiency with those standards.

In addition, candidates have extensive instruction themselves in deconstruction (Key Assessments 5, 6, 7) in accessing, reviewing, and planning instruction based on data aligned to the standards (Key Assessments 4, 5, 7, 8); in utilizing the Kentucky standards to establish learning targets and goals for students (Key Assessments 4, 6, 7, 8); and in designing, adapting, and modifying both assessments and instruction to align with the Kentucky Academic Standards (Key Assessments 4, 5, 6, 7, 8). Through these programmatic expectations, candidates develop knowledge in the content areas as well as build capacity as educators who know how to use the standards to impact instruction.

Our programs assess content knowledge through GPA and through the PRAXIS exam. In addition, our key assessments require that students apply expectations of KTS 1: Demonstrates Applied Content Knowledge. They do this in various contexts and environments: through course-level assessments, in lesson planning and design, and in clinical experiences. Those course level assessments impact candidates' GPA, which is one of the measures that the EPP uses to determine programmatic success in this area. Several key assessments directly link to candidates' demonstrated content knowledge through KTS 2: Designs and Plans Instruction and KTS 5: Assesses and Communicates Learning Results as well. When candidates carefully align their standards-based learning goals with both assessment and instruction, they demonstrate a thorough understanding of the Kentucky Academic Standards. Programmatic-level assessments, such as Key Assessments that measure KTS 1, 2, and 5 (e.g., Key Assessments 4, 5, 7, 8), provide evidence of our teacher candidates' success. While PRAXIS does not directly align to Kentucky Academic Standards, it does establish baseline content knowledge for teacher educators, and our EPP also uses that measure to evaluate candidates' preparedness and depth of knowledge.

3. Kentucky P-12 Curriculum Framework and Kentucky P-12 Assessment System – Candidates use KTIP documents and templates for planning, designing, implementing, and reflecting. They use the Sources of Evidence lesson planning tool in multiple courses, including ELE 302, EDC 300, EMS 300W, and methods (ELE 421, 422, 423, and 424), to name a few. They use the KTIP post-observation document in methods and student teaching. They utilize the Professional Growth Plan in their methods cluster of courses as well. In addition, candidates use templates to assess, diagnose, and prescribe (EDF 413, EMS 490), and they use EPP-prepared documents and online portfolios to organize units, document learning, and differentiate instruction for learners. Our candidates utilize these documents and implement many of these designed tasks in their clinical experiences as well, beginning in CED 300 all the way through CED 499.

Kentucky's P-12 curriculum framework responds to the understanding that educators must create a 21st century learning environment that is motivating, current, and global. Our candidates specifically are expected to plan with 21st century learning approaches in mind in their EMS 300W and methods courses, for example, where they design interdisciplinary units. Beyond that, the candidates themselves experience a cognitively stimulating, creative, collaborative, and problem-solving learning environment as well. From the newly designed, dyad-focused clinical experiences to the course embedded collaboration and creativity assignments (EDF 203, for example), the EPP is preparing its candidates to think and communicate more globally, more responsively, and more critically. We are encouraging deeper, more reflective goal setting; we are embedding direct instruction in cultural competency and ethics/professional behaviors across the professional core; and we are promoting leadership through collaborative professional growth. These elements will make our candidates stronger as learners and as reflective practitioners. Candidates subsequently apply these skills and approaches to their own curricular planning as they learn to effectively use data, to differentiate in meeting every learner's instructional needs, and to deliver high quality instruction through research based practice. Kentucky's framework reminds its educators that cross-curricular competencies and processes are as important to curriculum design as the standards themselves. In expecting our candidates – as both learners and teachers themselves – to self/peer evaluate (through professional growth plans and dyad clinical placements), develop/use digital tools (in EMS/EDC 300, EDF 204, methods, and student teaching), and support cognitive/social/affective engagement (EMS/EDC 300, methods, and student teaching), we promote candidates' maturity as informed and influential classroom decision-makers...as opposed to mere implementers of tasks and instructional techniques. Elements of collaboration, communication, technology, global perspectives, and critical/creative thinking are embedded throughout the candidates' experience and are expected to be reflected in the way that they plan and implement instruction, in clinicals, with K-12 students.

Kentucky's assessment systems also impacts candidates' experience. From the time that they are introduced to the concept of assessment data and accountability in their initial foundations course, EDF 203, to a course mid-way through their preparation where they access and analyze school report cards (EMS 300W), to their methods/student teaching semesters where they begin exploring - more intentionally - classroom-level, school-level, and district-level data to make informed instructional decisions about class, group, and individualized student instruction, candidates understand that assessment data meet needs of various stakeholders and are useful for many purposes. In other courses (e.g., ELE 302/EMS 474, EDF 413, EDC 300, and EMS 490, etc.), candidates begin to recognize that data drive classroom interventions; they experience the impact that pre/post data have on instruction and goal-setting; and they

recognize that assessment is a means to an end, not an end in itself. Candidates also learn about the accountability role of assessment in various courses (e.g., EDF 203, EDF 413, methods), thereby recognizing that while classroom instruction can be informative for day-to-day decisions, school and district data are useful to parents, legislators, and communities as well.

4. Candidate use of KAS in Lesson Planning – Candidates are using the following KTIP documents in their preparation program: Sources of Evidence: Lesson Plan, Sources of Evidence: Post Observation Reflection, Sources of Evidence: Professional Growth Plan, and Sources of Evidence: Self Assessment. In addition, when they complete their student teaching placement (CED 499), they are introduced to the Professional Learning Log, the Records and Communication tool, and the Student Voice process/documentation. Candidates are initially introduced to the Lesson Plan tool in EDC 300 and EMS 300, where they spend significant time with the standards and learning how to deconstruct them. They also begin teaching in their CED 300 clinical (which accompanies EDC 300 & EMS 300), and they utilize the Post Observation Reflection in that context as well. In the key assessment (i.e., Key Assessment 7) associated with this course, candidates are evaluated on their ability to utilize these templates for planning and reflection. Candidates continue to use the Lesson Plan/Reflection tools in CED 400, CED 450, and CED 499, deepening their applications for balanced assessment, discipline-specific and research-supported pedagogy, and differentiated instruction (see Key Assessment 4 for CED 499). Candidates also use an EPP developed protocol for assessing/diagnosing/prescribing instruction related to both behavior and content, beginning in CED 400 and continuing in CED 450 and CED 499. Candidates complete a professional reflection cycle with the self assessment tools, beginning in CED 450 and continuing through CED 499. Candidates also utilize an EPP-prepared unit plan template in EMS 300, methods, and student teaching. In lesson planning, specifically, candidates are directed to align standards, assessment, and instruction; to utilize available data for lesson planning and reflection; and to sequence lessons within a bigger context of unit or thematic instruction. Key Assessments 4, 5, 6, 7, and 8 all require candidates to utilize KTIP documents and apply research-based instructional practices.
 5. Complete descriptions of key assessments and the corresponding rubrics for EPP created assessments are presented in the Key Assessments documents at <http://epsb-caep.eku.edu/program-review>.
- iii. SPA Alignment– All secondary programs are aligned to KTS, InTASC, ISTE Standards for Teachers, and CAEP. See All Initial Secondary Spa Alignment chart at <http://epsb-caep.eku.edu/program-review>.

The Biological Sciences teaching program is also aligned to NSTA Standards. This alignment is illustrated in the Biology Program Review Spa Alignment chart at <http://epsb-caep.eku.edu/program-review>.

III. Evidence of Field/Clinical Partnerships

The EPP maintains partnerships with nearly 30 districts as evidenced by the attached document including the MOAs with our partnering districts. See Clinical Partnerships MOAs at <http://epsb-caep.eku.edu/program-review>.

Madison County Public Schools, with district offices in Richmond, Kentucky is our closest partner at the main campus of EKU. As with all districts partnering with the EPP for clinical placement Eastern Kentucky University has a formal Memorandum of Agreement to work with Madison County Schools as well as a Memorandum of Understanding between the superintendent and EKU office of clinical experiences. Madison County and the Office of Clinical Experiences work together to provide classroom settings for a range of clinical experiences, from the introductory guided experiences to more advanced professional semester and the full year residency placements. Madison County administrators and school leaders, along with leaders from partnering districts, serve on the Educator Preparation Advisory Committee, an advisory group that meets three times each year to review program data, clinical experiences, and proposed revisions to programs or clinical experiences, and work together for continuous improvement of candidate preparation.

As with the pre-student teaching clinical experiences, Eastern Kentucky University's Office of Clinical Experiences works closely with districts for student teacher placement. The priority is to provide the year-long residency whenever possible for student teachers. For example, in the Corbin ISD and EKU Clinical Partnership, all student teachers remain in the residency 1 (Methods) semester placement for residency 2 student teaching. This agreement is a formal partnership between EKU and Corbin ISD.

EKU university supervisors, working in the placement districts, make recommendations based on their experiences collaborating with the district cooperating teachers and principals. EKU faculty working in the field with student teacher supervision and methods clinical supervision make recommendations based on experiences working with effective teachers.

Representatives from Eastern Kentucky University, Madison County Public Schools, Corbin Independent School District, and several other partnering districts serve on the Educator Preparation Advisory Committee and provide expertise on preparation program recommendations. These highly qualified public school partners also often serve as adjunct professors for certain courses, which gives them another perspective and builds on the working relationship between EKU and these districts.

IV. Syllabi – Professional Education/Methods

- a. Syllabi for the Clinical courses and Professional Education Core are linked at <http://epsb-caep.eku.edu/program-review>. See Clinical Courses All Programs and Professional Education Core All Programs.
 - b. The methods syllabus for ESE 561 in the Biology teaching program is linked under Sciences: Biology 8-12 at <http://epsb-caep.eku.edu/program-review>.
- V. Content syllabi (sampling)** A sampling of content syllabi for the Biology Program Content Core is linked under Sciences: Biology 8-12 at <http://epsb-caep.eku.edu/program-review>.
- VI. Program Faculty Matrix** Information for all program faculty is included in the Clinical Educator chart at <http://epsb-caep.eku.edu/program-review>.
- VII. Curriculum Contract/Guidesheet** The planned programs include the admission criteria, required coursework, and exit criteria including the Praxis Licensure Exam disclaimer. The Planned Program for Biology is linked under Sciences: Biology 8-12 at <http://epsb-caep.eku.edu/program-review>.