**EDAP 676-31, Technology Applications for Science Teaching**

**Course Syllabus**

**UNIVERSITY OF LOUISVILLE**

**The Department of Teaching and Learning**

**Instructor**

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**Catalog Description**

Methods, techniques, and materials of instruction for meaningful and appropriate use of technology for the teaching of mathematics and science in the middle and high school. Equipment and computer software used in the course as well as student projects required will vary according to advances in the available technology and the interest of prospective students.

**Course Purpose**

The purpose of this course is to explore a wide variety of technology-based applications and their relevance to science teaching and learning in middle and secondary school settings. Learners will investigate the use of technology to support general pedagogy, such as that used for communication, presentation of content, and assessment. Learners will also investigate specific applications of technology to facilitate data collection and analysis, as well as the use of virtual manipulatives, animations, and simulations. Throughout this course, students will also understand the complexities of technology integration into public school settings, with particular attention paid to the legal, ethical, financial, and social aspects of technology usage.

**Required Readings/Texts**

* Bell, R.L., Gess-Newsome, J., & Luft, J. (2008). *Technology in the secondary science classroom.* Washington, DC: NSTA Press. Available as a free download from NSTA.org (see link on Blackboard site)
* LiveText
* Supplemental readings as assigned in class and posted on Blackboard
* Software downloads (freebies) as indicated in class
* Websites, as posted on Blackboard and the class Wiki site

**COURSE BACKGROUND**

**Conceptual Framework**

The conceptual framework, *Shaping Tomorrow: Ideas to Action,* embodies a unified rationale for our diverse programs that includes three constructs: Inquiry, Action, and Advocacy. Under the construct of ***Inquiry,*** and through active engagement and skilled training in methods of rigorous ***Research***, candidates develop the knowledge, skills, and dispositions to become ***Critical Thinkers***. Scholarship, informed practice through inquiry and reflection, is performed not in isolation but in communion with others, both within the university and in the world (Shulman, 2004). Under the construct of ***Action,*** and through continual ***Practice***, candidates develop the knowledge, skills, and dispositions to become ***Problem Solvers*** in the community. They are encouraged to apply knowledge and change practice to solve real world problems. Under the construct of ***Advocacy,*** and through dedicated, committed ***Service*** to their peers, university, community, and world, candidates develop the knowledge, skills, and dispositions to become ***Professional Leaders***. Our candidates are empowered to participate fully in the life of the metropolitan community in which we live, to practice social justice, and to seek equity of educational access for all the constituents.

As a key part of an approved program in the College of Education and Human Development, this course includes objectives aligned to the CEHD Conceptual Framework and aligned with national expectations for teachers of science in grades 5-12. EDAP 676-31, Technology Applications for Science Teaching aligns with the conceptual framework in the following ways:

***Inquiry***

* Explore key purposes for technology implementation in science education
* Investigate ways in which technology can be used to appropriately support instructional goals
* Identify and report on useful Internet sites related to science education and technology integration
* Self-assess current practice/skills/knowledge with respect to technology integration

***Action***

* Explore a variety of existing and emerging technologies
* Design standards-based lessons and activities that demonstrate technology integration
* Collaborate with other teachers and pre-service teachers to investigate course content
* Design and carry out a plan to develop a product related to technology integration that meets one’s own technology integration needs

***Advocacy***

* Explain legal, ethical, financial, and social issues related to technology implementation
* Describe features of Universal Designs for Learning and other ways to ensure access to students with a variety of needs

**Course Connections to Conceptual Framework**

The course has as its foundation the Conceptual Framework of the College of Education and Human Development. Through course activities and assignments, students will demonstrate the three constructs of *inquiry, action,* and *advocacy*. Instructional technology is a field that grows rapidly; accordingly, end-users cannot be expected to learn about every potential technology application. Rather, this course intends to facilitate participants’ development in using the skills of inquiry to critically evaluate the appropriateness of various forms of technology integration, taking action to develop effective instructional experiences that integrate technology appropriately, and advocating for the access to and use of appropriate technology by all students to meet individual learning needs.

**Relevant Professional Standards Met by this Course**

*Kentucky Teacher Standards (2008)*

In addition to other Kentucky Teacher Standards related to instruction and teacher professional development, this course primarily addresses Standard 6: The teacher demonstrates the implementation of technology. Descriptions of the Advanced Level Performance of relevant standards follow:

**Standard 1:** The teacher demonstrates applied content knowledge**.** The teacher demonstrates a current and sufficient academic knowledge of certified content areas to develop student knowledge and performance in those areas.

**1.1** *Communicates concepts, processes, and knowledge.* Accurately and effectively communicates an in-depth understanding of concepts, processes, and/or knowledge in ways that contribute to the learning of all students.

**1.5** *Identifies and addresses students’ misconceptions of content.* Consistently anticipates misconceptions related to content and addresses them by using appropriate instructional practices.

**Standard 2:** The teacher designs and plans instruction.The teacher designs/plans instruction that develops student abilities to use communication skills, apply core concepts, become self-sufficient individuals, become responsible team members, think and solve problems, and integrate knowledge.

**2.4** *Plans instructional strategies and activities that address learning objectives for all students.* Plans a learning sequence using instructional strategies and activities that build on students’ prior knowledge and address learning objectives.

**Standard 6:** The teacher demonstrates the implementation of technology. The teacher uses technology to support instruction; access and manipulate data; enhance professional growth and productivity; communicate and collaborate with colleagues, parents, and the community; and conduct research.

**6.1** *Uses available technology to design and plan instruction.* Uses appropriate technology to design and plan instruction that supports and extends learning of all students.

**6.2** *Uses available technology to implement instruction that facilitates student learning.* Designs and implements research-based, technology-infused instructional strategies to support learning of all students.

**6.3** *Integrates student use of available technology into instruction.* Provides varied and authentic opportunities for all students to use appropriate technology to further their learning.

**6.4** *Uses available technology to assess and communicate student learning.* Uses technology to assess student learning, manage assessment data, and communicate results to appropriate stakeholders.

**6.5** *Demonstrates ethical and legal use of technology.* Provides and maintains a safe, secure, and equitable classroom environment that consistently promotes discerning and ethical use of technology.

**Standard 9:** The teacher evaluates teaching and implements professional development. The teacher evaluates his/her overall performance with respect to modeling and teaching Kentucky’s learning goals, refines the skills and processes necessary, and implements a professional development plan.

**9.1** *Self assesses performance relative to Kentucky’s Teacher Standards.* Thoroughly and accurately assesses current performance related to the Kentucky Teacher Standards and any school/district professional development initiatives.

**9.2** *Identifies priorities for professional development based on data from self-assessment, student performance and feedback from colleagues.* Reflects on data from multiple sources (i.e., self-assessment, student performance, feedback from colleagues, school/district initiatives) and identifies priority areas for growth.

**9.3** *Designs a professional growth plan that addresses identified priorities***.** Designs a clear, logical professional growth plan that addresses all priority areas.

**Standard 10:** The teacherprovides leadership within school/community/profession. The teacher provides professional leadership within the school, community,

**10.1** *Identifies leadership opportunities that enhance student learning and/or professional environment of the school.* Identifies leadership opportunities within the school, community, or professional organizations to advance learning, improve instructional practice, facilitate professional development of colleagues, or advocate positive policy change; and selects an opportunity to demonstrate initiative, planning, organization, and professional judgment.

*International Society for Technology in Education Standards for Teachers 2008 (ISTE NETS-T):*

1. **Technology Operations and Concepts.** Teachers demonstrate a sound understanding of technology operations and concepts. Teachers:
   1. demonstrate introductory knowledge, skills, and understanding of concepts related to technology (as described in the ISTE National Education [Technology Standards for Students](http://cnets.iste.org/students))
   2. demonstrate continual growth in technology knowledge and skills to stay abreast of current and emerging technologies.
2. **Planning and Designing Learning Environments and Experiences.** Teachers plan and design effective learning environments and experiences supported by technology. Teachers:
   1. design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
   2. apply current research on teaching and learning with technology when planning learning environments and experiences.
   3. identify and locate technology resources and evaluate them for accuracy and suitability.
   4. plan for the management of technology resources within the context of learning activities.
   5. plan strategies to manage student learning in a technology-enhanced environment.
3. **Teaching, Learning, and the Curriculum**. Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning. Teachers:
   1. facilitate technology-enhanced experiences that address content standards and student technology standards.
   2. use technology to support learner-centered strategies that address the diverse needs of students.
   3. apply technology to develop students' higher order skills and creativity.
   4. manage student learning activities in a technology-enhanced environment.
4. **Assessment and Evaluation.** Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies. Teachers:
   1. apply technology in assessing student learning of subject matter using a variety of assessment techniques.
   2. use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.
   3. apply multiple methods of evaluation to determine students' appropriate use of technology resources for learning, communication, and productivity.
5. **Productivity and Professional Practice.** Teachers use technology to enhance their productivity and professional practice. Teachers:
   1. use technology resources to engage in ongoing professional development and lifelong learning.
   2. continually evaluate and reflect on professional practice to make informed decisions regarding the use of technology in support of student learning.
   3. apply technology to increase productivity.
   4. use technology to communicate and collaborate with peers, parents, and the larger community in order to nurture student learning.
6. **Social, Ethical, Legal, and Human Issues.** Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in PK-12 schools and apply those principles in practice. Teachers:
   1. model and teach legal and ethical practice related to technology use.
   2. apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.
   3. identify and use technology resources that affirm diversity
   4. promote safe and healthy use of technology resources.
   5. facilitate equitable access to technology resources for all students.

**COURSE CONTENT**

The content of this course was developed around the relevant professional standards (KTS-2008, ISTE NETS-T; above) in conjunction with the NSTA Position Statement on Computers in Science Education: currently available from <http://www.nsta.org/about/positions/computers.aspx>. Specific technologies embedded in this course include those used for presentation of science concepts, communication, teacher productivity, student engagement and interaction, data collection and analysis, and assessment. Furthermore, sociological issues related to technology integration (funding, equity, Internet safety, digital citizenship) will be addressed throughout the course.

Several broad questions will serve as a guide to the interpretation of technology experiences in this course:

* What are the appropriate uses of technology for students and for teachers, and how do these differ?
* Is the technology appropriate and effective for the intended task?
* How does the use of technology enhance the teaching and learning experience? What does it allow the teacher and/or students to do faster, more efficiently, more accurately, or more safely?
* How should teachers evaluate technology and select technology that supports instructional goals?
* How can teachers ensure student mastery of content through technology use, in addition to the engaging and entertaining features of many technologies?

**Course Objectives**

Candidates are expected to develop a sophisticated understanding of the following concepts and be able to:

* Integrate technology into accurate and appropriate standards-based science instruction (KTS 1.1, 1.5, 2.4; NETS-T 2a, 2b, 2e, 3a-3d)
* Judge the appropriateness of technologies for specific instructional contexts (setting and content; KTS 6.1; NETS-T 2b, 2c, 2d, 2e, 3a-3d)
* Analyze candidate’s own professional needs with respect to technology and identify strategies to improve skills (KTS 9.1, 9.2, 9.3; NETS-T 1a, 1b)
* Describe societal concerns related to technology implementation (KTS 6.5, 10.1; NETS-T 6b, 6c, 6d, 6e)
* Model legal and ethical technology practices (KTS 6.5, 10.1; NETS-T 6a, 6e)
* Analyze the contribution of given technologies to effective science education, including those related to: (KTS 6.2, 6.3, 6.4; NETS-T 2c, 3a-3d, 4a-4c, 5a-5d)
  + Social networking, communication, and Web 2.0 tools
  + Audio/visual tools and digital imaging
  + Data collection and analysis
  + Assessment
  + Interactive learning technologies
  + Professional productivity
* Demonstrate basic skills with given technologies, including those related to: (KTS 6.1, 6.2, 6.3, 6.4; NETS-T 1a, 2c, 3a-3d, 4a-4c, 5a-5d)
  + Social networking, communication, and Web 2.0 tools
  + Audio/visual tools and digital imaging
  + Data collection and analysis
  + Assessment
  + Interactive learning technologies
  + Professional productivity
* Critically evaluate and reflect on current literature regarding technology implementation in science instruction (KTS 10.1; NETS-T 2b)

**COURSE ASSIGNMENTS/REQUIREMENTS**

Additional information will be provided in class and on Blackboard.

1. Technology Integration Activities (25%)

In this course, you will be experiencing a number of different educational technologies and exploring how to integrate them with the content that you teach. Activities that you will complete will include:

* Annotated Bookmarks – as a class, we will develop a Wiki in order to share “the best of the Web”. Each class member will have responsibility for locating and describing a certain number of bookmarks and posting them to our Wiki. Bookmarks will be due in two stages, in order to spread out your thinking and your work. Requirements will be negotiated in class.
* Audio/Visual Microteaching – After discussing how to embed quality audio-visual materials into science instruction, each class member will select an online video, digital image, or sound file related to science content. Class members will then present the video to the class as a “microteaching” lesson.
* Podcast/videocast Assessment – after experiencing a technology-based lesson, you will interview one another as a form of assessment and post the interview as a podcast or videocast.
* SmartBoard Lesson – after discussing and experience interactive uses of SmartBoard technology, you will prepare a lesson that takes advantage of the many features of interactive white boards.
* Simulation Evaluation – As a class, we will explore various online or handheld simulations or virtual manipulatives. Each class member will identify some specific sims, evaluate their role and usage in a science classroom, and share their findings in a collaborative workspace. You will also be asked to read one another’s evaluations and provide commentary.

2. Self-Assessment and Final Reflection (10%)

In the first week of the session, you will self-assess your readiness to implement science education-related technologies into your teaching practice. The format for this self-assessment will be discussed in class. You will then prepare a professional growth plan that addresses how you will work to improve your skills in several areas. At the end of the course, you will prepare a reflection on how activities completed in and out of class so far have impacted your professional growth.

3. Article Discussions/Reflections (15%)

To achieve a broad perspective on the many considerations regarding technology implementation in science classrooms, we will be reading from a well-respected text as well as current periodical literature. The format for discussions and reflections will vary and may include class or small group discussions, in-class reflective activities, online discussion forums, and written reflective essays. Class members may be responsible for selecting appropriate articles for some topics, while readings will be pre-selected for other topics. Topics to be addressed with supplemental articles include Internet safety, legal and ethical considerations of technology usage, technology equity/access, funding, and student use of technology.

Readings from the Bell, Gess-Newsome, & Luft (2008) text are assigned to correspond to the particular technologies being examined each week. Students are expected to have read the chapter(s) in advance of the class meeting and apply the readings to the technology experiences, even if specific time is not given to a formal class discussion of the book chapters or if specific reflective assignments are not given.

4. “Push Yourself Project” (Hallmark Assessment Task; 40%)

Just as your own technology backgrounds, experiences, readiness, and goals are multifaceted, so is the Hallmark Assessment for this course. In the first week of the session, you will be asked to select from six options for a Hallmark Assessment Task. These six options appear later in this syllabus, and you are encouraged to carefully consider which option best meets your own developmental needs at this point in your professional career. You may wish to consult with the instructor as you develop your proposal and as your final project emerges. You will submit an initial proposal for instructor approval by June 29. Your accomplishments will be presented and celebrated at the last class, on August 5.

5. Professionalism and Participation (10%)

The underlying philosophy of this class is one of social interaction. The experiences each person brings to the class contribute to the body of knowledge learned. It is difficult, if not impossible, to make up experiences missed by not being in class. We all learn from others, and your thoughts and questions are an important part of the learning process. Likewise, a professional attitude and demeanor are vital to success as a teacher. Therefore, the following rubric will be used for attendance, promptness, participation, and professionalism.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Exemplary Performance** | **Meets Standard** | **Unacceptable Performance** |
| **Attendance** | Does not miss a class. | Misses one class because of illness, emergency, or professional obligation. Notifies professor ahead of class missed. | Misses two or more classes and/or does not notify professor ahead of class(s) missed. |
| **Promptness** | Attends each class on time. | Is tardy for one class because of emergency or professional obligation. | Is tardy for two or more classes. |
| **Participation** | Reads assigned text each week and can discuss thoroughly. Shares relevant experiences with others in class. Contributes to the overall quality of the learning environment by contributing thoughtful outside resources and information. | Reads assigned text each week and can discuss, but not in an in-depth fashion. Shares relevant experiences with others in class. | Does not read assigned text. Does not participate or participates minimally. |
| **In-Class Activities** | Consistently completes all in-class activities in a positive manner. Attends to the completion of assignments with purpose and a spirit of inquiry. | Completes most in-class activities, but may require prompting. | Does not complete in-class activities or presents barriers to others. |
| **Professionalism** | Materials handed in on time and prepared with clarity, precision, and attention to detail. Team/group membership is positive and handled with a sense of responsibility. | Materials handed in on time. Team/group membership is positive. | Materials are not handed in on time and may or may not be clear. Team/group membership is confrontational or irresponsible. |

The following grading scale will be used to determine your final grade.

100%-98% A or A+ 4.0

97%-94% A 4.0

93%-90% A- 3.7

89%-87% B+ 3.3

86%-84% B 3.0

83%-80% B- 2.7

79%-77% C+ 2.3

76%-74% C 2.0

73%-70% C- 1.7

69%-67% D+ 1.3

66%-64% D 1.0

63%-60% D- 0 .7

59% and Below Fail 0.0

**OTHER COURSE POLICIES AND PROCEDURES**

**University Policy on Severe Weather**

While we make every effort to announce our closings through the local media, their processes can lead to confusing or sometimes wrong information. Please note that the university will provide official school closing information in the following ways:

* A notice on the university home page, http://louisville.edu, and on the UofL Today site, http://louisville.edu/uofltoday
* Text messages sent to students, faculty and staff who sign up for UofL Alerts. Sign up for alerts at: http://louisville.edu/alerts
* Emails sent to students and employees on their Groupwise accounts
* A recorded message at 502-852-5555

These are the only venues through which we can guarantee accurate information. They also are the first four methods by which we will communicate, although we will continue to announce our decisions through media as well. Whenever possible, we will announce decisions regarding morning classes by 6 a.m. and decisions regarding evening classes by 3 p.m. For purposes of this policy, evening classes will be defined as any classes beginning at or after 4:30 p.m.

**Department of Teaching and Learning Attendance Policy**

**Goal: To establish a high level of professionalism for every teacher.**

* Attendance is REQUIRED at each class session
* If you are absent, you will not receive full participation credit for the course. The course syllabus will document the participation guidelines/requirements for each course. If you are absent, you must contact the instructor of the course, preferably prior to the class session. It is your responsibility to find out what you missed.
* You must be on time for class sessions. Repeated tardiness will also impact your participation credit. Absences and tardiness will be considered in assessing your dispositions.
* If you are absent TWICE from a course that meets once weekly, or THREE times in a course that meets twice weekly, you MUST initiate a meeting with the course instructor to determine whether you will still be able to pass the course with the acceptable grade required by your program and if you can devote the necessary time to the course.

***NOTE:* *This T&L policy refers to a semester-long course; missing more than one class in an intensive summer session is cause for concern, and missing two classes requires a meeting with the instructor and/or advisor.***

* If you miss the course an additional time, the course instructor will schedule a meeting with you and the program director to complete a *Communication of Concern*. Extenuating situations will be considered on an individual basis.
* You may be required to complete additional assignments to compensate for class sessions for which you were absent. Even with these assignments, your participation credit may still be affected.
* When you expect a prolonged absence (out more than a week), contact **CEHD** Teaching and Learning Staff @ 852-6431. **U of L** Dean of Students Cardinal Angel Program is available for support @ 852-5787 or DOS.louisville.edu. You will need to provide your name, student ID number, and circumstances.

**Policy on Instructional Modifications**

Students with disabilities, who need reasonable modifications to complete assignments successfully and otherwise satisfy course criteria, are encouraged to meet with the instructor as early in the course as possible to identify and plan specific accommodations. Students will be asked to supply a letter from the Disability Resource Center to assist in planning modifications.

**CEHD Diversity Statement**

Diversity is a shared vision for our efforts in preparing teachers, administrators, school counselors, and other professionals. Students will be encouraged to investigate and gain a current perspective of diversity issues (race, ethnicity, language, religion, culture, SES, gender, sexual identity, disability, ability, age, national origin, geographic location, etc.) related to their chosen fields. Students will also have the opportunity to examine critically how diversity issues apply to and affect philosophical positions, sociological issues, and current events in a variety of areas. Students will examine their belief systems and be encouraged to reexamine and develop more grounded beliefs and practices regarding diversity.

**Research Statement**

Any research conducted in schools will be consistent with University of Louisville and school district human subjects research policies.

**Technology Expectations**

Assignments are to be word-processed. Continuing and regular use of email is expected. Hallmark assessments must be posted electronically in LiveText. Students are expected to search the web, use online tools, and use Blackboard as a learning tool. We will work with a variety of software, both web-based and downloadable, during this course. You will be asked to download some of that software in order to use on your own. Such software will only include software downloads available for free from reputable organizations, and ones that I am also willing to download onto my own office and home computers.

**Electronic Equipment**

This is a course focused on the integration of technology into science instruction. Therefore, you will be expected to use a wide variety of electronic equipment, and this may include cell phones, PDAs, and laptops. While you are encouraged to make full use of electronic technologies to achieve the intended course outcomes, it is inappropriate to use these devices for other purposes during the teaching and learning process. Students are therefore asked to manage their electronic equipment responsibly so that it is not a distraction for anyone in the class. If you have a personal emergency that requires immediate communication, you may excuse yourself quietly and attend to the matter at hand. Otherwise, please save personal business until breaks or until after class has finished for the day.

**Plagiarism Statement**

Plagiarism is addressed by the Graduate School at the University of Louisville in two documents, both accessible on Blackboard. One explanation is in the *Graduate Catalog* in the “Student Code of Conduct” category and the other is in the *Graduate Student Handbook*, “Student Code of Conduct” category, section 5, item 5.

#### Closing

I look forward to working with you throughout the session. If you have any questions, comments, suggestions, or issues to raise, please do so at any appropriate time! Thanks! In addition to email communication, I also encourage phone calls and face-to-face communication and invite you to meet with me before or after class, or call us to set up an appointment.

Course adapted by Dr. Melissa Shirley, Summer 2010. Syllabus prepared by Dr. Melissa Shirley, Summer 2010.

**Course Calendar (subject to change as student needs arise)**

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| --- | --- | --- |
| Meeting dates | Class Topics and Activities | Assignments and Readings:  To be completed **BEFORE** coming to class |
| Week 1:  Tuesday, June 22 | 1. Introductions & Syllabus Overview 2. Technology standards for science education 3. Technology in Science Education: Goals, Issues & Concerns, Purposes, Types 4. Audio/Visual technologies | 1. Download and print “verification of reading syllabus” *signature page* (on Blackboard) 2. Read Ch 1 from Bell, Gess-Newsome, & Luft (hereafter referred to as “BGL”) |
| Week 1:  Thursday, June 24 | 1. Audio/Visual Microteaching 2. Class discussion on integrating A/V 3. Technology for presenting information 4. Concepts of “Universal Designs for Learning” | 1. Read BGL Chapter 2 2. Self-assessment on technology standards due (BB) 3. Prepare for A/V microteaching 4. Read/reflect UDL article(s) |
| Week 2: Tuesday, June 29 | 1. Communication and Productivity tools 2. Posting to a Wiki 3. Internet safety and Netiquette | 1. Read article(s) on Internet Safety 2. Create CMAP based on Internet Safety readings 3. HAT Initial Proposal due; in LiveText |
| Week 2:  Thursday, July 1 | 1. Communication & Productivity tools 2. Internet safety and Netiquette | 1. Read Edutopia article \*Top Ten Tips\* 2. Make a Wordle to share with us |
| Week 3:  Tuesday, July 6 | 1. Data collection, collection, and analysis through technology 2. Probeware and graphing calculators 3. Legal and ethical issues related to technology | 1. Read BGL Chapter 4 2. Read/reflect article(s) on legal and ethical issues |
| Week 3:  Thursday, July 8 | 1. Data collection, collection, and analysis through technology 2. Data visualizations & Geospatial technologies 3. Legal and ethical issues related to technology | 1. First set of Annotated Bookmarks completed (posted to class Wiki) 2. Read BGL Chapter 5 |
| July 11-17 | No Class Meeting – instructor available for assistance or consultation on “Push Yourself Projects” | Work on class assignments and “Push Yourself Project” |
| Week 4:  Tuesday, July 20 | 1. Data collection, collection, and analysis through technology 2. Issues of advocacy and access | 1. Read/reflect article(s) on advocacy/access 2. Read BGL Chapter 6 3. Pod/Videocast Due |
| Week 4:  Thursday, July 22 | 1. Technology for interaction and engagement: Interactive WhiteBoard Technologies 2. Designing lesson for interactive technology 3. Funding issues | 1. Read/reflect article(s) on funding 2. HAT Interim Progress Check |
| Week 5:  Tuesday, July 27 | 1. Technology for interaction and engagement: Simulations and virtual manipulatives 2. Developing a blog | 1. Read BGL Chapter 3 2. Read BGL Chapter 7 |
| Week 5:  Thursday, July 29 | 1. Technology for interaction and engagement: Simulations and virtual manipulatives 2. Adapting to a variety of technology-equipped classrooms | 1. Remainder of Annotated Bookmarks completed (posted to class Wiki) |
| Week 6:  Tuesday, August 3 | 1. Assessing student skills/use of technology 2. Using technology to assess content 3. Evaluating appropriateness and purposes of technologies | 1. Read BGL Chapter 8, 10 2. Sim Evaluation posting due (on blog) |
| Week 6:  Thursday, August 5 | 1. Presentations of “Push Yourself Projects” 2. Wrap-up discussion of technology purpose, goals, issues, types | 1. Sim Evaluation Commenting due (on blog) 2. Final self-reflection on technology standards 3. Final projects due |

**EDAP 676-30/EDAP 676-31 Hallmark Assessment Task (Pg 1)**

**(Note that there are six different possibilities for demonstrating the same competencies. Choose one of these six options for your HAT.)**

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| --- | --- | --- | --- |
| Hallmark Assessment Task:  “Push Yourself Project” | Unit of Study (new or enhanced) | Research Study Proposal (PhD students; for MEd & MAT students, an action research proposal is acceptable) | Learning New Technology |
| Initial Proposal (10%)  *Determine which project fits your needs best or propose a novel project. Identify the parameters of your project, how it meets your needs, and how it “pushes” your thinking about teaching with technology.* | For all projects, the initial proposal is due early in the session and must receive instructor approval before proceeding. The proposal is essentially an approximately one-page (single-spaced) description of the intended project, and includes the descriptors that follow and the basic elements from I and II that will be expanded upon in the final product. All projects should center on the use or role of technology in the teaching and learning of core science/mathematics content. | | |
| Describe the current unit of study. If the unit was previously taught, describe how it was taught. Include learning goals, objectives, and standards. Give an overview of the scope of general and content-specific technology use by teacher and students. Describe how creating or revising this unit “pushes” your thinking about teaching with technology. | Provide an overview of the intended research study. Describe how writing this proposal “pushes” your thinking about teaching with technology. | Submit a self-assessment by thoroughly and accurately describing your current level of proficiency in the chosen technology. Describe your goals for your learning, how you plan to meet the goals, and how you will evaluate and document your progress towards meeting those goals. Include a description of how this work “pushes” your thinking about teaching with technology. |
| Part I: Introduction, Purpose (15%)  *Provide the background to help a colleague or critic understand the nature and importance of your project.* | Include the context of the unit of study and situate it with respect to prior and future units. Include a description of students’ prior knowledge for both content/concepts and technology. If currently taught, describe how the unit is currently taught. Justify why the proposed unit design and use of technology is important for student learning. | Provide your research question and rationale for why this is a compelling study. Justify why what you intend to study and learn is important for others to know. | Describe your current knowledge base with respect to the technology and the extent of your skills with the technology. Identify an area for growth, and justify why this is a critical goal. |
| Part II: Background (20%)  *Situate the project in theory, research literature, practitioner literature, experience, and/or standards/policy documents.* | Include relevant standards, learning goals, and learning objectives (i.e., knowledge, skills, concepts, reasoning) addressed in the unit. Describe how students will be using the technology, and include the technology and supplemental resources you have available to you. | Provide a cogent theoretical and research background that includes your literature review and the theoretical framework in which you situate your work. Use a variety of sources, and write in scholarly form. | Describe what you will do to improve in your chosen area and why and how this project will improve your instructional effectiveness. Include a description of your action plan for improvement and your assessment plan to evaluate your growth. |
| Part III: Body (30%)  *Carry out the work that you proposed.* | Describe how you will instruct students in the technology tool(s) before they use them and how you will organize your classroom to maximize effectiveness of the technology given constraints of time, materials, and space. Describe the activities in which students will engage to meet the objectives, identifying the objectives addressed. Include clear, detailed, and complete lesson plans for two lessons from the unit, and describe the overall sequence of unit lessons and activities by including a brief description of unit lessons for which remaining lessons. | Describe the methodology you will use in this study, including details of how you will adapt the methodology to your particular study. Describe data sources, intended participants, analysis techniques to be used, and ethical and procedural considerations for your study. Indicate how you will describe any findings from your study. | Document what you did, the resources you used, and how you improved your skills. Include detailed evidence and examples to illustrate the progress that you made. |
| Part IV: Implications, Conclusions (15%)  *Relate your project to the broader goals of using technology to enhance teaching and learning of science or mathematics.* | Describe how each component of your unit plan uses technology to enhance student learning and justify why the use of technology was an essential component of this unit. Include a description of what you expect students will know or understand from using the technology. Describe how you will assess student understanding and use of technology. | Describe how you anticipate this study being situated in the context of existing literature and what this study adds to the field’s current understanding. | Describe the implications for your own teaching and for student learning from learning this technology. Describe the next steps for your ongoing development in this area. |
| Part V: Presentation (10%)  *Ensure that your project is in a form that can be shared with other professionals.* | For all projects: Presentation may mean correct application of content, format, aesthetics, professionalism in appearance and completion, completeness of the product, high standards of neatness/clarity, appropriate communication, etc. It may also take the form of a 10-15 minute presentation to the class in some format (if class time is devoted to presentations), or it may be the submitting and sharing of the final product. (e.g., A copy of the manuscript is posted on Blackboard.) An interim progress report may also be requested. Note that for all choices, PhD and Med students should consult a minimum of five (5) research sources. | | |

**EDAP 676-30/EDAP 676-31 Hallmark Assessment Task (pg 2)**

**(Note that there are six different possibilities for demonstrating the same competencies. Choose one of these six options for your HAT.)**

|  |  |  |  |
| --- | --- | --- | --- |
| Hallmark Assessment Task:  “Push Yourself Project” | Grant Proposal | Manuscript for Publication  (practitioner article, literature review, position paper/research commentary) | Learner-Designed  (according to this framework and with prior permission from the instructor) |
| Initial Proposal (10%)  *Determine which project fits your needs best or propose a novel project. Identify the parameters of your project, how it meets your needs, and how it “pushes” your thinking about teaching with technology.* | For all projects, the initial proposal is due early in the session and must receive instructor approval before proceeding. The proposal is essentially an approximately one-page (single-spaced) description of the intended project, and includes the descriptors that follow and the basic elements from I and II that will be expanded upon in the final product. All projects should center on the use or role of technology in the teaching and learning of core science/mathematics content. | | |
| Provide a statement similar to a “letter of intent” that describes what you propose to do with the requested funds and why. Include the name of the agency targeted for funding. Describe how writing this proposal “pushes” your thinking about teaching with technology. | Provide an outline of your manuscript. Include the name of the targeted publication, the intended audience, and an abstract-like description of what the manuscript will address. Describe how writing this manuscript “pushes” your thinking about teaching with technology. | Provide an overview of the project and how the project fits into the five-part structure of the framework. Also include a description of how this project “pushes” your thinking about teaching with technology. |
| Part I: Introduction, Purpose (15%)  *Provide the background to help a colleague or critic understand the nature and importance of your project.* | Describe why you are requesting the funds. Possibilities include funds for a research study or to purchase classroom equipment. Identify your targeted funding agency and list the proposal requirements. Justify why your work merits investment from the identified agency. | Describe what you will write about. Include the name of the targeted journal and how you selected it. Include details of the author guidelines, audience, and format for the manuscript (e.g., APA, Chicago). Justify why the information that you present is important to the members of the intended audience. | Defined by learner with instructor approval Justify the importance of this work. |
| Part II: Background (20%)  *Situate the project in theory, research literature, practitioner literature, experience, and/or standards/policy documents.* | Justify how the expenditure will enhance your or colleagues’ teaching effectiveness or student achievement. Include a relevant review of literature to situate your request in current research and expository work. This review is part of the proposal. | Provide a cogent practitioner or research background situated in current research and expository work as appropriate for the article. Your writing style should match that of the intended publication. This part may be combined with Part III. | Defined by learner with instructor approval |
| Part III: Body (30%)  *Carry out the work that you proposed.* | Provide a clear, detailed, and thorough description of the proposed work. Include a budget for how you will spend the money. (This will be requested by the funding agency.) Describe how the resources purchased with the funds will be used and by whom. | This is the body of the manuscript where you describe a unique and effective activity or pedagogical strategy, a unique and thorough view of research literature, strong evidence for a position, etc. This part may overlap with Part II. | Defined by learner with instructor approval |
| Part IV: Implications and Conclusions (15%)  *Relate your project to the broader goals of using technology to enhance teaching and learning of science or mathematics.* | Describe how you will evaluate and report on your progress of the funded work. Include specific details. This will be part of the proposal. | Write a reflection that describes how writing this manuscript aids in your professional development related to teaching and learning with technology. Implications of the work you describe may also be part of the manuscript. | Defined by learner with instructor approval |
| Part V: Presentation (10%)  *Ensure that your project is in a form that can be shared with other professionals.* | For all projects: Presentation may mean correct application of content, format, aesthetics, professionalism in appearance and completion, completeness of the product, high standards of neatness/clarity, appropriate communication, etc. It may also take the form of a 10-15 minute presentation to the class in some format (if class time is devoted to presentations), or it may be the submitting and sharing of the final product. (e.g., A copy of the manuscript is posted on Blackboard.) An interim progress report may also be requested. Note that for all choices, PhD and Med students should consult a minimum of five (5) research sources. | | |

**EDAP 676-30/EDAP 676-31 Hallmark Assessment Task**

**Note that there are six different possibilities for demonstrating the same competencies.**

**This is a general rubric to address all possibilities; specific details will be discussed in class.**

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| --- | --- | --- | --- |
|  | Exceeds Expectations | Meets Expectations | Does not Meet Expectations |
| Initial proposal  (10%)  (KTS 1.1, 9.1) | * Provides   + a clear description of the proposed project,   + some rationale for the importance of the work,   + some background for the work,   and   * + specific details related to the project as outlined in the assignment description   AND   * provides a rationale for the project that thoroughly details how the project will “push” thinking about teaching with technology | * Describes the proposed project without   + justifying the importance of the work,   + including sufficient background for the work,   or   * + including sufficient detail related to the project as outlined in the assignment description   AND/OR   * provides a rationale for the project that doesn’t clearly detail how the project will “push” thinking about teaching with technology | * Does not describe the proposed project or rationale for the work or describes the proposed project in general terms or with insufficient detail to determine the scope of the work   AND/OR   * does not describe or describes in general terms without sufficient detail for determining how the project will “push” thinking about teaching with technology |
| Part I: Introduction and purpose  (15%)  (KTS 1.1, 9.1) | * Provides a clear and thorough introduction that sets the context for the project and logically justifies the significance of the proposed work   AND   * clearly and thoroughly addresses specific details as outlined in the assignment description | * Provides an introduction that sets the context for the project and shows reasonable effort to present the rationale and significance of the proposed work using some logic   AND/OR   * addresses specific details as outlined in the assignment description | * Provides no introduction or an introduction that does not clearly set the context for the project or argue for the proposed work   AND/OR   * does not include or inadequately addresses details outlined in the assignment description |
| Part II: Background  (20%)  (KTS 9.2) | * Clear and thoroughly describes background information that relates to and informs the design of the project without omitting any considerations crucial for the work | * Describes background information that is only somewhat significant to or informative for the design of the project and may omit some considerations | * Describes no background information or information that is insignificant to or informative for the design of the project |
| Part III: Body  (30%)  (KTS 6.1, 6.2, 6.3, 9.3) | * Clearly and thoroughly describes the project mechanics in terms of the past, present, or future as appropriate to the project type | * Clearly and relatively thoroughly describes the project mechanics in terms of the past, present, or future as appropriate to the project type | * Provides no or an unclear description of the project mechanics in terms of the past, present, or future as appropriate to the project type |
| Part IV: Implications and/or conclusions  (15%)  (KTS 6.4, 9.3) | * Clearly and thoroughly describes how the work will be or was evaluated   AND   * clearly and thoroughly addresses specific details outlined in the assignment description | * Describes how the work will be or was evaluated   AND/OR   * addresses specific details outlined in the assignment description | * Provides no description, a description with little detail, or an unrealistic description for evaluating the work   OR   * omits some of the specific details outlined in the assignment description |
| Part V: Presentation  (10%)  (KTS 1.1) | * Uses acceptable style and grammar; * accurately portrays subject matter and technology; * neatly and logically presents project;   AND   * clearly communicates project content | * Includes minor errors or is minimally unclear in   + style and grammar;   + subject matter and technology;   + neatness and logic;   AND/OR   * + communication | * Includes many minor errors or lack of clarity   AND/OR   * one or more major errors or clarity issues in   + style and grammar;   + subject matter and technology;   + neatness and logic;   + communication |

**EDAP 676-31, Technology Applications for Science Teaching**

**Course Syllabus**

**UNIVERSITY OF LOUISVILLE**

**The Department of Teaching and Learning**

Please review the syllabus, print this page, and return this page to instructor.

I have reviewed the syllabus for *EDAP 676-31, Technology Applications for Science Teaching*. The course requirements, class schedule, weightings of assignments and grading scale have been explained. I understand that I will demonstrate my learning through designing and implementing various forms of technology, reading, participating in class activities, and through the “Push Yourself Project”. I understand that I will be expected to try out a variety of new technologies, both in class and out of class.

NAME

SIGNATURE

DATE