Syllabus (Chandler)
TTE 523 Curriculum Issues and Practices in Science

Instructors
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Office hours: By appointment or online via Google Hangouts
Class Location: D2L and Chandler Community Center
Day and Time: This class will meet weekly online and face to face on Saturdays in Chandler according to the schedule below:

Date	12:30 – 3:00
September 6	Content Methods
September 27	Content Methods
October 25	Content Methods
November 15	Content Methods
November 29	Thanksgiving Break
December 6	Content Methods
December 13	TBD

We will also arrange a time to meet online via Google Hangout once a week for an hour at a time that is conducive for all participants – day/time TBD during first week of class.

Course Description

Current issues in science education and their application to classroom instructional practices and procedures. Topics based upon recent concerns and developments. Students will study and implement effective, research based science instruction in conjunction with their site-based internship. Students

will come away from the course with skills and dispositions necessary to meet some of the national standards set for teachers:

- The InTASC Standards:
  http://www.ccsso.org/Documents/2011/InTASC_Model_Core_Teaching_Standards_2011.pdf
- The ISTE NETS-T Standards:
  http://www.iste.org/Libraries/PDFs/NETST_Standards.sflb.ashx
- The University of Arizona Teacher Preparation Programs Professional Standards (UA TPP Professional Standards):
  http://www.coe.arizona.edu/professional_standards

Course Objectives

The learner will be able to:	Standard
Assess student prior knowledge, identify student misconceptions and build upon individual *funds of knowledge*.	InTASC Standards: 1a, 1b, 1d, 1e, 1f; 2c, 2d, 2j, 2m; 4d, 4e, 4k, 4m, 4o
Design standards-based lessons and units that provide students opportunities for authentic scientific inquiry through the integration of science content.	InTASC Standards: 1d; 3b; 4a, 4f; 5a, 5i, 5m, 5s; 7a, 7b, 7c, 7d, 7e, 7g, 7i, 7k, ;
Use a variety of formative and summative assessment strategies when planning and delivering instruction.	InTASC Standards: 6a, 6c, 6g; 7d
Ask effective questions, provide clear instructions and communicate content at a level students can comprehend.	InTASC Standards: 1a, 1d, 1f; 5d, 5e, 5f, 5g; 8b, 8f, 8i
Respect the diverse cultural backgrounds and values held by students when teaching topics some may view as controversial.	InTASC Standards: 2d; 3a,3c, 3f; 4b; 5g
Identify and use technology resources to maximize student learning and to differentiate instruction.	InTASC Standards: 2a, 2f; 3g; 4g; 5c; 6i; 8g ISTE.NETS-T Standards: 1a; 2a, 2b, 2c; 3b, 3d; 4a, 4b, 4c
Implement lessons that maximize active participation and allow students of all abilities and backgrounds to take an active role in their own learning.	InTASC Standards: 1b; 2a, 2e; 3h; 4b, 4h; 5a, 5c; 8a, 8b, 8d, 8g, 8h, 8i
Analyze and reflect upon his or her instruction using video or other digital media.	InTASC Standards: 9a, 9b, 9d, 9e, 9f ISTE. NETS-T Standards: 5c
Participate in online professional learning communities by engaging in meaningful dialog and sharing of best practices through ongoing online discussion forums	InTASC Standards: 9a, 9b, 9d, 9f; 10f, 10g ISTE. NETS-T Standards: 3a, 3b, 3c, 3d; 5a, 5c, 5d

Common Core State Standards

All methods courses in the Teach Arizona program require our pre-service teachers to create unit/lesson plans, instructional activities and assessments that align to the Common Core State Standards, as well as other relevant national, state, and district standards:

- The Common Core State Standards: http://www.corestandards.org/ or http://www.azed.gov/standards-practices/common-core-state-standards/

Attendance and Participation

Regular attendance is required. More than one unexcused absence will result in a reduction in the student's participation grade. Excessive absences may result in the student being dropped from the course or receiving a failing grade. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that religion. Absences pre-approved by the UA Dean of Students, or designee, will be honored. As a matter of courtesy, please notify Dr. Roth in advance of any absences when possible.

Textbook

There is no assigned textbook for this class, but **students are required to obtain a student membership to the National Science Teachers Association** www.nsta.org . Students must also download or bookmark the Arizona State Science Standard Articulated by Grade Level. www.azed.gov and the Next Generation Science Standards (available at http://www.nextgenscience.org/next-generation-science-standards). Additional readings will be provided by the instructor. Recommended but not required is The Core Six" Essential Strategies for Achieving Excellence with the Common Core (Silver, Dewing, Perini) 2012. ISBN#978-1-4166-1475-3. This book contains some excellent ideas for implementing the Common Core Standards and is available online for about $15.

Assignments and Grades: Below are criteria for successful completion of assignments, and alignment to the standards. This course aligns to the 6-unit morning field internship (TTE 593). The Backward Design Unit Plan, Video Lesson and Reflection, 5E Unit Plan and Demonstration Lesson should be designed for your school site classroom.

- **Participation: (20% of course grade)** Lessons will require participation in online discussion via D2L, including weekly journal reflections and other related online activities. Participation will also be evaluated based upon attendance and completion of weekly online assignments. Participants will also meet online via Google Hangouts once a week and attendance at these sessions will be factored into the participation grade. InTASC Standards: 9, 10

- **Common Core and Next Generation Science Standard lesson plan: (10% of course grade)** Create a lesson plan that includes activities designed specifically to incorporate elements of the NGSS, Common Core State Standards (Arizona College and Career Ready Standards) and SSTELLA Practices. Detailed assignment guidelines will be provided in class. InTASC Standards 2,7

- **Backward Design unit plan:** (**10% of course grade)** You will create a unit plan following a template found in chapter one of Wiggins and McTighe's Understanding by Design. Detailed assignment guidelines will be provided in class
InTASC Standards: 5, 6, 7,

- **Video lesson reflection: (10% of course grade)**   Students will provide the instructor with a copy of the video either on DVD/CD or through secure online methods. Video cameras will be made available to students who require them.

  - **Required elements:**
    - Release form signed by you
    - Release form signed by students and their parents if students appear in the video
    - Copy of a video showing 15 – 20 minutes of instruction.
    - A copy of the lesson plan
    - A written analysis of your instruction focusing on key elements such as student engagement, clarity of instructions and modeling, checks for understanding, classroom management, closures, etc. Students should provide specific evidence from the recorded lesson to support their analysis. Required length is 1 – 2 pages double spaced.
  InTASC Standards: 9 - ISTE.NETST 3, 4, 5

- **Classroom observation summaries: (10% of course grade)** Field notes are required when observing other classrooms. These notes may include a description of the physical layout of the room, seating arrangement of the students, lesson objectives, instructional methodology (lecture, lab, class discussion, game or simulation, etc.) and any interesting or noteworthy actions or responses by the teacher and students. Do not refer to any school, teacher or student by name.
  - **Required elements:**
    - A scanned or photographed copy of your field notes with any school, student or teacher identifying information redacted
    - A brief description of the instruction
    - Your analysis of the instruction…what worked, what did not and any implications for your own instruction.
  InTASC Standards: 9

- **5E unit plan: (10% of course grade)** Design a unit plan based upon content that you will teach during the spring semester. Base the unit plan on a "big idea" per Backward Design and incorporating SSTELLA Practices.
  - **Required elements:**
    - The unit addresses key content that will be taught spring semester
    - All of the elements of the 5E instructional model (engage, explore, explain, elaborate, evaluate) must be represented and clearly identified
    - A variety of instructional methodologies are utilized (e.g. laboratory activity, modeling, lecture, discussion, reading, debate, simulation, worksheets/advanced organizers, student reports, presentations, etc.)
    - SSTELLA Practices are matched to instructional practices where appropriate (a minimum of three SSTELLA Practices must be addressed within the unit)
    - The instructional method matches the particular "e". For example, an exploration should consist of some sort of hands-on activity while an explanation might consist of a reading assignment or a lecture.
    - The plan specifies the specific content covered, the timeframe (how many days or minutes the activity takes), the instructional method used, the 5e element or

"e" each activity addresses and any formative or summative assessment strategies used.
InTASC Standards: 1, 2, 3, 5, 6, 7

Demonstration lesson: (30% of course grade - This is the benchmark assignment for TTE 523 and must be passed in order to pass the course. A passing grade is defined as an average score of "2" or above (across all categories) on the grading rubric.)
InTASC Standards: 1, 2, 3, 4, 5, 6, 7, 8, 9 – ISTE.NETST 1, 2, 4

<u>Demonstration Lesson Assignment Guidelines:</u>

Each student will select a single lesson from his/her 5e unit plan and teach the lesson to his/her peers. The time allotted for the lesson is 40 minutes. The lesson will be evaluated using the Demonstration Lesson Rubric. The assignment will be weighted 50% for teaching, 30% for a detailed lesson plan and 20% for a written reflection on the lesson describing strengths, areas in need of improvement and plans for improvement.

Each student must submit a lesson plan for the demonstration lesson that follows the lesson plan format presented previously in class. Alternately, a student may use the lesson plan format mandated by his/her host school district if the district requires a specific planning model. The lesson plan will be evaluated using the Demonstration Lesson Rubric.

Lesson Plan Requirements:
- Content objective(s)
- Language objective(s)
- Standards alignment
- Task analysis including sub-objectives, Bloom's Level and time allotted
- Teaching strategies used for each sub-objective (must be varied) that include checks for understanding requiring overt student active participation
- Denote strategies targeting specific SSTELLA Practices (minimum of two practices)
- Comprehensive list of all materials required to teach the lesson

Demonstration Lesson Requirements
- Teach "bell to bell"
- Begin with an engagement activity or anticipatory set that taps into students' prior knowledge
- The lesson must address important content and the teacher must demonstrate content mastery
- The lesson must contain activities that support at least two SSTELLA Practices
- The lesson must include the use of some technology
- The students must be actively engaged
- Use questioning and/or other strategies effectively to check for understanding
- Include a closure activity

Reflective Essay Requirements:
- Describe elements of the lesson that were particularly effective and explain why they were effective
- Describe elements of the lesson that needed improvement and explain what made that part of the lesson less effective than desired
- Provide specific revisions to the lesson that you intend to make in order to improve the lesson.

Demonstration Lesson Rubric

Planning:

Criteria	4 points	3 points	2 points	1 point
Terminal Objective InTASC: 7	Provides a Terminal Objective that is appropriate for curriculum goals and content standards. The objective specifies both content and behavior.	Provides a Terminal Objective that is appropriate for curriculum goals and content standards. The Objective specifies either content or behavior but not both.	Provides a Terminal Objective with questionable alignment with curriculum goals and content standards. The Objective specifies either content or behavior but not both.	The Terminal Objective does not appear to be aligned with curriculum goals and content standards. The Objective lacks specificity.
Language Objective InTASC: 2, 7	The plan explicitly provides tools of language development including strategies for making content accessible to ELLs. The language objective is clearly stated.	The plan implies tools of language development including strategies for making content accessible to ELLs. The language objective is clearly stated.	The language objective is clearly stated but tools of language development are not evident.	The language objective is unclear or missing. Tools of language development are not evident.
Task Analysis InTASC: 7	The plan includes a series of sub-objectives that appropriately sequence learning experiences, demonstrates a variation in Bloom's level and matches the final sub-objective to the terminal objective.	The sub-objectives may not provide appropriately sequence learning experiences, or demonstrates a variation in Bloom's level. The final sub-objective may not match the terminal objective.	The sub-objectives may not provide appropriately sequence learning experiences. Reference to Blooms level may be inaccurate or missing. The final sub-objective may not match the terminal objective.	The sub-objectives does not provide appropriately sequence learning experiences. Reference to Blooms level is inaccurate or missing. The final sub-objective does not match the terminal objective.
Teaching Strategies &	The plan provides teaching strategies and checks for	The plan provides teaching strategies and checks for	The plan provides teaching strategies and checks for	The plan contains less than one strategy and/or one check for

Checks for Understanding InTASC: 7, 8	understanding that include one strategy per sub-objective, varied strategies, one check for understanding per sub-objective and opportunities for overt active student participation.	understanding that include one strategy per sub-objective. Strategies may not be varied. There is one check for understanding per sub-objective. Student active participation is implied.	understanding that include one strategy per sub-objective. Strategies are not varied. There is one check for understanding per sub-objective. There is little evidence of opportunities for student active participation.	understanding per sub-objective. There is little or no evidence of opportunities for student active participation.
Criteria	4 points	3 points	2 points	1 point
SSTELLA Practices InTASC; 2, 8	The plan clearly identifies how instruction will address a minimum of two SSTELLA practices.	The plan identifies two STTELLA practices but the connection between the instruction and the practices is not clear.	The plan only identifies a single STELLA practice.	The plan fails to identify any SSTELLA practices.
Lesson Materials InTASC: 3	The plan provides a comprehensive list of materials necessary and all listed materials are attached.	The materials are listed but not all listed materials are attached.	The list of materials is incomplete and or not all listed materials are attached.	The list of materials is incomplete or missing and few if any listed materials are attached.

Teaching:

Criteria	4 points	3 points	2 points	1 point
The instructional strategies and activities addressed participants' prior knowledge. InTASC 2	The student asks questions specifically designed to elicit participants' prior knowledge or engages students in an activity specifically designed to elicit prior knowledge throughout the lesson.	The student asks questions specifically designed to elicit participants' prior knowledge or engages students in an activity specifically designed to elicit prior knowledge at some point within the lesson.	The student appears to make some attempt to elicit prior knowledge but the method used is not specifically designed to do so.	No participant prior knowledge was elicited
The lesson	The entire lesson	A majority of the	Some of the lesson	The lesson content

involved fundamental concepts of the subject and was at an appropriate level for the students. InTASC 1, 4, 5	covered content essential to mastery of the subject and was at an appropriate level for the students.	lesson covered content essential to mastery of the subject and was at an appropriate level for the students..	content was essential for mastery of the subject and/or the level was slightly higher or lower than an appropriate level for the students.	was not essential for mastery of the subject and/or the level was not appropriate for the students
Criteria	**4 points**	**3 points**	**2 points**	**1 point**
The lesson promoted strongly coherent conceptual understanding. InTASC 2, 4, 5	The entire lesson was designed and implemented in a way that targeted a strong understanding of broad concepts rather than discreet facts or minutiae.	A significant portion of the lesson was designed and implemented in a way that targeted a strong understanding of broad concepts rather than discreet facts or minutiae.	Some of the lesson addressed the broad concepts but the majority of the lesson addressed acquisition of discreet facts with little connection to the big ideas.	There was little meaningful content covered and few if any connections to the big ideas were made.
The student had a solid grasp of the subject matter content inherent in the lesson. InTASC 4,5	The student demonstrated complete understanding of every aspect of the content covered and exuded confidence in content knowledge.	The student demonstrated strong understanding of the content and/or exhibited only minor lapses in confidence in content knowledge.	The student demonstrated adequate content knowledge and/or exhibited a significant lack of confidence in content knowledge.	The student demonstrated serious gaps in content knowledge and/or demonstrated a profound lack of confidence in content knowledge.
Participants were actively engaged in thought-provoking activity that often involved the critical assessment of ideas. InTASC 3, 5, 6, 8	The participants were completely engaged throughout the lesson and were involved in thoughtful discussion involving analysis of the lesson material and or metacognition.	The participants were actively engaged for a majority of the lesson and spent some time reflecting on their learning	The participants were engaged for a portion of the lesson and spent little if any time reflecting on their learning.	There was minimal if any active participation or reflection on the part of participants.
The teacher	The student used	The student used	The student occasionally	The student asked few

used questioning strategies effectively. InTASC 2, 3, 8	instructional questions effectively throughout the lesson to engage students, check for understanding and guide student learning. The student used questions to elicit additional questions from participants and guided participants toward answering their own questions.	instructional questions effectively at times during the lesson to engage students, check for understanding and guide student learning. The student was the primary source of the questions instead of the participants.	used instructional questions effectively but spent a significant amount of time "telling" rather than "asking."	instructional questions and utilized lecture or "telling" as the primary means of instruction
Criteria	**4 points**	**3 points**	**2 points**	**1 point**
Classroom discourse was focused on the lesson topic and much of the discussion was between and among participants. InTASC 3	Participants were engaged in meaningful dialog about the lesson content throughout the lesson.	Participants were engaged in meaningful dialogue about the lesson content for much of the lesson.	Participants were engaged in meaningful dialogue about the lesson content for a portion of the lesson.	There was little dialog among students or most of the student dialog was unrelated to the lesson content.
There was a climate of respect for what others had to say. InTASC 3	Dialog was respectful and respected. Participants listened attentively to each other and responded respectfully at all times. There was evidence that the ideas of others were heard and valued.	Participants listened attentively to each other and responded respectfully most of the time. Only occasionally did participants interrupt one another or show minor disrespect.	"Side bar" conversations and other distractions occurred frequently while participants were speaking. Participants were openly critical of comments made by others.	Few rules governing classroom discussion were evident. Participants were often inattentive or rude to classmates.
Active participation of participants was encouraged and valued. InTASC 2, 4, 5, 8	Participants were encouraged to engage with the material and ask questions. Their enthusiasm was rewarded and opportunities for them to explore further or dig deeper were encouraged.	Participants were encouraged to engage with the material and ask questions. Opportunities for students to explore on their own or dig deeper were not encouraged.	Participants' opportunities to actively engage with the material were limited. Activities were very restrictive and did not allow for deeper exploration by participants.	Participants had minimal opportunity to engage with material. Their role was primarily that of spectator.
The teacher acted as a resource person, working to support and enhance participants'	The teacher could best be described as "the guide on the side" by assuming the role of facilitator and helping participants work through the material for themselves. The teacher served as a resource rather than a purveyor of	The teacher provided many opportunities for participants to make discoveries and draw conclusions for themselves, but occasionally provided information that the participants could have determined for	The teacher provided much of the information and answers to participants even though the participants could have found this information out for themselves.	Participants were rarely given opportunities to provide input in the learning process.

	information. The teacher welcomed participants' questions.	themselves.		
learning. InTASC 3, 5				
The lesson included the effective use of technology. ISTE.NETST 1, 2, 4 InTASC 3, 9	The teacher used technology extensively and effectively to engage students and promote student learning. Both the teacher and the students used technology in a legal and ethical manner.	The teacher and students used some technology effectively to engage students and promote student learning. Both the teacher and the students used technology in a legal and ethical manner.	The teacher used some technology effectively. The teacher used technology in a legal and ethical manner.	Little or no technology was used or the technology was used in an inappropriate way.

Reflection:

Criteria	4 points	3 points	2 points	1 point
The student provided a thoughtful reflection regarding the lesson. InTASC 9	The student provided a detailed, thoughtful reflection to evaluate the outcomes of his/her teaching, to improve planning and practice, and develop relevant learning experiences.	The student provided a somewhat detailed reflection to evaluate the outcomes of his/her teaching and to improve his/her practice.	The student provided a somewhat detailed reflection to evaluate the outcomes of his/her teaching but strategies for improving practice were unclear.	The students reflection lacked depth of thought and/or did not provide strategies for improving practice.

Special Needs and Accommodations

Students who need special accommodation(s) should contact the Disability Resources Center (520-621-3278; http://drc.arizona.edu/). Students who are registered with the Disability Resource Center must submit appropriate documentation to their instructor if requesting reasonable accommodations. Please make an appointment to meet with your instructor during office hours to discuss accommodations that will allow you to fully participate in the course requirements and activities

Nondiscrimination and Anti-Harassment Policy

The College of Education joins in the University of Arizona's commitment to an environment free of discrimination, harassment and retaliation based on race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or other protected characteristics. If you have questions or concerns about possible discrimination or harassment, including in a field experience or any University-sponsored activity, please contact the University's Office of Institutional Equity, 520-621-9449, http://equity.arizona.edu.

University of Arizona Code of Conduct

All University of Arizona students should be familiar with the UA Code of Conduct. The Dean of Students Office has developed information about policies, procedures, rights and responsibilities that should be followed by students. The UA Code of Conduct can be found at: http://deanofstudents.arizona.edu/policiesandcodes.

University of Arizona Code of Academic Integrity

Students are expected to adhere to the Code of Academic Integrity which addresses issues such as: cheating, fabrication, facilitating academic dishonesty, and plagiarism. The Code of Academic Integrity can be found at: http://deanofstudents.arizona.edu/codeofacademicintegrity

Expectations of Professionalism

When you entered Teach Arizona you signed The University of Arizona UA TPP Professional Standards Student Contract in which you agreed to abide by the UA TPP standards. Please review the Teacher Candidate Standards which addresses professional roles and responsibilities. The Teacher Candidate Standards can be found at: http://www.coe.arizona.edu/professional_standards

Note: Information contained in this syllabus with the exception of the attendance and grading policies may be subject to change with reasonable advanced notice, as deemed appropriate by the instructor.