JacksTeach Secondary Science and Lab Safety Survey

JTCH 2051 Section 001
Spring 2024

This course meets educator preparation standards for one or more certification programs; a complete listing of all the educator preparation standards this course meets can be found at: https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx

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Office Hours: Tuesdays 2:00-3:30 PM, Wednesdays 9:00 AM – 11:30 AM, & Thursdays 3:00 PM – 4:00PM
Department: JacksTeach, STEM

Class meeting time and place: Online

Credit Hours: 0-3

SFASU Policy 5.4: The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students who wish to be successful should plan to spend at least two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Prerequisite: admission to SFA’s Educator Preparation Program or permission of JacksTeach co-director

Course Description

Topics in physics and lab safety and management for students seeking a composite science certification in Texas and/or the skills required to safely and efficiently manage a high school science lab and prep/storage area.
Program Learning Outcomes

The successful JacksTeach candidate will:

1. Demonstrate a deep understanding of and ability to apply STEM content and foundational pedagogical content knowledge through effective teaching in K-12 classrooms; (Texas Teacher Standards 1, 2, 3, 4; Texas PPR Standards I, IV; Texas Science Standards I-IV, VI, XI)

2. Develop an effective classroom management plan that creates a STEM classroom environment conducive to active learning and inquiry techniques, and supportive of individual and collaborative learning; (Texas Teacher Standards 1, 2, 4; Texas PPR Standards II, III; Texas Science Standards I-V, VII)

3. Use a variety of instructional strategies to meet the needs of all students and inspire STEM learners to develop curiosity about local and global issues and the connections to STEM, through the application of critical thinking, creativity, problem solving, and technology; (Texas Teacher Standards 1,2, 4; Texas PPR Standards II, III; Texas Science Standards I-VI, VII, XI)

4. Implement a variety of assessment techniques to monitor learner progress and guide adaptation of instructional plans; and (Texas Teacher Standards 3, 5; Texas PPR Standards I, III, IV; Texas Science Standards IV-V)

5. Exhibit a disposition toward continued learning and professional growth through the utilization of self-evaluation and research-based practices. (Texas Teacher Standards 5, 6; Texas PPR Standards I, IV; Texas Science Standards I-IV)

Student Learning Outcomes

After completing the required readings and participating in class activities, the prospective mathematics or science educator will be able to do the following:

1. Demonstrate science or mathematics content knowledge in the design and teaching of middle school lessons aligned with district curriculum. (PLO 1).

2. Utilize exemplary sources of inquiry-based science and mathematics lessons (PLO 1, 2, 3).

3. Identify the unique attributes of adolescent students and implement teaching strategies that are effective in the middle school environment (PLO 1, 2, 3).

4. Design and implement inquiry-based lessons using the 5E Instructional Model (PLO 1, 2, 3, 4).

5. Plan for and implement safe instructional practices (PLO 1, 2, 3).

6. Demonstrate awareness of diversity within classrooms, discuss the implications for teaching and learning, and explore strategies for achieving instructional equity (PLO 5).

7. Design and teach lessons that incorporate the use of technology (PLO 1, 2, 3).

8. Use probing questions to elicit feedback on students’ acquisition of knowledge (PLO 1, 2, 3, 4).

9. Use pre- and post-assessments aligned to performance objectives to evaluate student learning, to provide instructive feedback to middle school students, and as a basis for revising lesson plans. (PLO 1, 2, 3, 4)

10. Provide instructive feedback to peers. (PLO 1, 2, 3, 4, 5)

11. Reflect on teaching experiences to revise lesson plans. (PLO 1, 2, 3, 4, 5)

12. Assess commitment to pursue teaching as a career path. (PLO 5).

**A complete listing of all the educator preparation standards this course meets and a list of the key assessments used for program accreditation purposes can be found at: (www.sfajacksteach.org)**
Text and Materials

Course materials will be provided by the instructor on D2L. Students will have access to 240 Tutoring throughout the semester.

Course Requirements

Participation

Students are expected to participate fully in online content on D2L and keep up with all deadlines.

Technology

Students must be able to use technology for timely and appropriate communication with your instructor and classmates:

- Check email daily.
- Access the course website to post assignments and discussion board topics.
- Use online collaborative tools and/or use technology in educational settings.

If assistance is needed to meet these requirements, please see the instructor. Help is available!

Grading Policy

The standard university A, B, C, D, F grading system will be employed. A 10% deduction will be taken for all work received 1-3 days late. Work turned in more than three days late without permission from the instructor will receive a zero.

Grades from this course will be taken for class assignments (35%), Content Quizzes (35%), and the final (30%).

Attendance Policy

This class is online. Students are expected to meet deadlines for all assignments and assessment. Notify the instructor via email or phone if an extension is needed. Absences are excused by the instructor.

Course Topics

- Topics in Physics include Motion, Forces, Magnetism, Electromagnetic Energy, Thermodynamics, Waves, and Quantum Physics.
- Embedded Topics in Lab Safety and Stockroom Management include Chemical Inventory and Storage, Chemical Disposal, Corrosives and Reactive Chemicals, Flammables, Toxins, General Lab Safety, Laboratory Activity Design and Management, Accidents in the Laboratory, SDS, Legal Issues and Liability.
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<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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| 1 18-Jan | • Course Overview  
• Syllabus  
• Domain II – Physics, Competency 4: 1-D and 2-D Motion  
  • Motion Graphs  
  • Position, Displacement, Speed, Velocity, Acceleration  
  • Constant, Uniform Acceleration  
  • Projectile Motion |
| 2 22-Jan | Domain II – Physics, Competency 4: 1-D and 2-D Motion  
  • Circular Motion  
  • Fluids  
  • Frames of Reference |
| 3 29-Jan | Domain II – Physics, Competency 5: Laws of Motion  
  • Newton’s First, Forces, and FBD’s  
  • Vectors  
  • Newton’s Second  
  • Newton’s Third |
| 4 5-Feb | Domain II – Physics, Competency 6: Gravitational and Electromagnetic Forces  
  • Universal Gravitation  
  • Electrostatic Forces, Fields, Potentials  
  • Magnetism  
  • Magnetic Fields |
| 5 12-Feb | Domain II – Physics, Competency 6: Gravitational and Electromagnetic Forces  
  • Magnetic Forces  
  • E&M  
  • EMR and waves |
| 6 19-Feb | Domain II – Physics, Competency 7: Electricity and Magnetism  
  • Electrostatics  
  • Conductors, Circuits, Resistance, Resistivity, Potential Difference, Capacitance, and Electromotive Force |
| 7 26-Feb | Domain II – Physics, Competency 7: Electricity and Magnetism  
  • DC Circuits: Series, parallel, current, resistance, voltage, power  
  • AC Circuits  
  • Electromagnets  
  • Motors, Generators, Transformers |
| 8 4-Mar | Domain II – Physics, Competency 8: Conservation of Energy and Momentum  
  • Work  
  • Energy  
  • Power  
  • Conservation of Energy |
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| 9 18-Mar | Domain II – Physics, Competency 8: Conservation of Energy and Momentum  
- Work-Energy Theorem  
- Linear and angular momentum  
- Conservation of Momentum  
- Collisions |
| 10 25-Mar | Domain II – Physics, Competency 9: Thermodynamics  
- Heat Transfer  
- Temperature and Heat  
- Thermal Expansion, Heat Capacity, Heat and Energy |
| 11 1-Apr | Domain II – Physics, Competency 9: Thermodynamics  
- First Law of Thermodynamics  
- Second Law of Thermodynamics |
| 12 8-Apr | Domain II – Physics, Competency 10: Characteristics and Behaviors of Waves  
- Characteristics of Waves  
- Transverse Waves  
- Longitudinal Waves  
- Wave Propagation |
| 13 15-Apr | Domain II – Physics, Competency 10: Characteristics and Behaviors of Waves  
- Reflection, Fiber Optics  
- Refraction  
- Diffraction  
- Interference  
- Applications |
| 14 22-Apr | Domain II – Physics, Competency 11: Quantum Physics  
- Wave Particle Duality  
- Uncertainty Principle  
- Photoelectric Effect  
- Quantum Model of the Atom |
| 15 29-Apr | Domain II – Physics, Competency 11: Quantum Physics  
- Absorption and Emission Spectra  
- Lasers and Semiconductors |
| 16 6-May | Final Exam |
Academic Integrity (4.1)
Academic integrity is the responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways, including instruction on the components of academic honesty and abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

Withheld Grades Semester Grades Policy (5.5)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the coursework because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course to compute the grade point average. For additional information, go to https://www.sfasu.edu/policies/course-grades-5.5.pdf.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodation. For additional information, go to http://www.sfasu.edu/disabilityservices/.
Student Wellness and Well-Being

SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:

The Dean of Students Office (Rusk Building, 3rd floor lobby)
http://www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

SFA Human Services Counseling Clinic Human Services, Room 202
http://www.sfasu.edu/humanservices/139.asp
936.468.1041

The Health and Wellness Hub “The Hub”
Location: corner of E. College and Raguet St.
http://www.sfasu.edu/thehub
936.468.4008
thehub@sfasu.edu

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person - mind, body, and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

www.sfasu.edu/thehub
936.468.4008
thehub@sfasu.edu

Crisis Resources:

- Burke 24-hour crisis line 1(800) 392-8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline 1(800) 273-TALK (8255)
- Crisis Text Line: Text HELLO to 741-741