Click to Register

STEM-I Professional Development Course

3 days / 24 hours

Course Designed by: Jeff Dudukovich, M.Ed., STEM PROS™

Course Description

Transform your STEM teaching in just 3 days! Whether you're a new educator or a seasoned veteran, our hands-on intensive, 3-day course is designed to boost your school's STEM program to new levels. Here's what you'll gain:

- **10 hours of hands-on STEM and STEAM labs**, integrating innovative AI tools to revolutionize lesson planning and activity creation.
- **8 hours of enriching science content knowledge**, with expert interactive demonstrations and an emphasis on engaging teaching strategies.
- **6 hours of interactive classroom skill-building,** focused on improving STEM literacy and harnessing the power of AI for more effective and engaging education.

Most importantly, discover how to make STEM education irresistibly fun! Plus, learn how to create a top-tier STEM classroom on a budget. Participants receive **exclusive access to the course Google Classroom** to extend their learning.

Target Audience

K-12th grade STEM teachers who wish to learn different strategies and/or improve their teaching skills, **teachers in need of credit** to apply toward certification, **instructional coaches** who wish to train other teachers, and **administrators** who wish to strengthen their school STEM programs. This math and science standards-based course is designed for both public and private school teachers. The techniques and strategies also work well for teachers of other subjects outside of STEM.

Course Goals

This 3-day STEM-I professional development course is designed to:

- Enhance teachers' expertise in physical, earth-space, and nature of science, alongside optimizing use of internet resources and technology.
- Empower teachers to share innovative ideas and practices with peers, develop cross-curricular lessons, and strengthen school STEM programs.
- Equip teachers with AI tools for lesson design and activity formulation.
- Refine teaching strategies, classroom management, and efficiency, including streamlined lesson planning and curriculum development.
- Integrate reading strategies to enhance STEM lesson comprehension.
- Provide cost-effective teaching materials, online resources, and guidance for constructing STEM lab tools.
- Boost student performance and refine assessment methods.
- Foster a collaborative network of STEM educators for resource and idea sharing.

STEM-I Professional Development Course

Learning Outcomes

By the end of this course, participants will be able to:

- Develop lesson plans using the 5E model (engage, explore, explain, elaborate, evaluate).
- Incorporate the use of AI in developing lessons.
- Design lessons with cross-curricular collaboration and vertical articulation in mind.
- Design highly engaging and effective laboratory activities on a shoestring budget.
- Set up and manage a Google Classroom to streamline assignments, quizzes, & resource sharing.
- Use community resources to build material and equipment capacity.
- Model effective teaching techniques for colleagues.
- Develop an effective formative and summative assessment system.
- Build and equip an efficient STEM storage space.
- Design and plan hands-on activities for various grade levels for the entire school year!
- Plan and schedule in-house field trips, STEM Family Nights, and STEM summer camps.

Required Course Materials

- Notebook
- Pencils/Pens
- Laptop computer
- Gmail account
- Tennis shoes

Grading

To receive full credit, all participants must:

- Attend all sessions and actively participate in hands-on activities.
- Collaborate with peers to design and present one lesson using the 5E Model. Teachers are encouraged to refer to the hands-on activities and demonstrations used during the course in their lesson plans.

Documentation, including sign-in sheets and certificates of completion, will be provided to schools and certifying organizations upon successful completion of the course.

Classroom Use of Course Materials

All participants are authorized to access lesson plans, demonstration design plans, the Google Classroom for this specific course, and resources provided after the completion of this course to use in their own classrooms and schools. Some resources and design plans from this course are subject to copyright laws and may ***not*** be reproduced outside of a participant's school, may ***not*** be posted to a website, and may ***not*** be used for future monetary gain.

STEM-I Professional Development Course

Class Schedule*

Day One	Start	End	
Morning	8:30 AM	9:00 AM	Sign-in, Technology Setup, and Introductions
Session	9:00 AM	9:30 AM	**STEM Activity #1: Team Building Activity**
	9:30 AM	10:00 AM	Building Bright Futures: The Power of STEM in Elementary Education
	10:00 AM	10:30 AM	AI as Your Teaching Assistant: Effortless Lesson Ideas & Prompts
	10:30 AM	11:00 AM	Bringing Lessons to Life: The 5E Model & ABCs of Instruction
	11:00 AM	12:00 PM	**STEM Activity #2: Roller Coaster Physics and the 5E Model**
	12:00 PM	12:30 PM	**Lunch**
Afternoon	12:30 PM	1:30 PM	**STEM Activity #3: Paper Airplanes and the Scientific Method**
Session	1:30 PM	2:30 PM	Building Capacity: Unlocking Measurement Labs for Deeper Learning
	2:30 PM	3:00 PM	Seeing Sound: Exploring Vibration, Frequency & Waves
	3:00 PM	4:00 PM	Lighting the Way: Exploring Refraction, Reflection & the EM Spectrum
	4:00 PM	4:30 PM	**STEM Activity #4: Seeing Sound Device**
	4:30 PM	5:00 PM	Vocabulary Hacks: Supercharge Reading Comprehension
Day Two	**Start**	**End**	
Morning	8:30 AM	9:00 AM	Gravity Well & Beyond: Exploring Orbits, Eclipses, and the Universe
Session	9:00 AM	10:00 AM	Powering Up: Exploring Electricity, Magnetism & Circuits
	10:00 AM	11:00 AM	Forces in Motion: Gyroscopes & Ballerinas
	11:00 AM	12:00 PM	Mastering the Art of Formative & Summative Assessments
	12:00 PM	12:30 PM	**Lunch**
Afternoon	12:30 PM	1:30 PM	**STEM Activity #5: Hot Wheels Speedometry**
Session	1:30 PM	2:00 PM	Equipping your STEM Classroom on a Shoestring Budget
	2:00 PM	3:00 PM	**STEAM EDC #1: Build a Car**
	3:00 PM	4:00 PM	Maximizing Impact: Plan STEM Field Trips, Family Nights & Camps
	4:00 PM	4:15 PM	Powering Up: Exploring Energy Transfer, Transformation & Conversion
	4:15 PM	5:00 PM	**STEM Activity #6: Newton's Rocket**

(Class Schedule continued on next page)

STEM-I Professional Development Course

Day Three	Start	End	
Morning	8:30 AM	10:00 AM	**STEAM EDC #2: Stomp Rockets the STEM PROS Way!**
Session	10:00 AM	11:00 AM	**STEAM EDC #3: Raingutter Boat Race**
	11:00 AM	12:00 PM	Matter Matters: Classifying, Atomic Theory & Building Atoms
	12:00 PM	12:30 PM	**Lunch**
Afternoon	12:30 PM	1:30 PM	**STEAM EDC #4: Mechanical Arm**
Session	1:30 PM	2:30 PM	Earth Science in Action: Stream Tables, Plate Tectonics & More
	2:30 PM	3:30 PM	**STEAM EDC #5: Battle Bots**
	3:30 PM	5:00 PM	STEM Lesson Presentations and Feedback

*We reserve the right to modify the schedule to add additional activities not scheduled, as time permits, to meet the needs and requests of participating teachers.

EDC: *Engineering Design Challenge*
STEM: *Science. Technology. Engineering. Math*
STEAM: *Science. Technology. Engineering. Art. Math*

Content Knowledge

ALL activities, content knowledge demonstrations, and lessons will include lesson key points, reference materials, and demonstration construction plans.

Content knowledge instruction includes, but is ***not limited*** to:

- **Nature of Science:** Scientific approach/method, variables, controls, test outcomes, repeat vs replicate, scientific models, empirical evidence (Nature of Science will be covered throughout the entire workshop)
- **Sound:** Sound as vibrational energy, frequency, energy, pitch, sound waves vs light waves, medium, speed of sound
- **Light:** Electromagnetic spectrum, light waves vs. sound waves, lenses, telescopes, microscopes, refraction, reflection, absorption, speed of light
- **Electricity:** Circuits, conductors vs. insulators, static electricity
- **Magnetism:** Ferrous vs. non-ferrous, repulsion vs attraction, magnetic fields
- **Forces and Motion:** Newton's Laws, inertia, momentum, speed, velocity, acceleration, moment of inertia, angular momentum, gyroscopes, balanced vs unbalanced forces, aerodynamics, air resistance, air pressure, vacuum, friction, sports physics
- **Gravity:** Law of Universal Gravitation, mass vs. weight, mass and distance
- **Space:** Solar system, hierarchy of the universe, stars, planets, seasons, rotation vs revolution/orbit, Sun/Moon/Earth system, distances
- **Energy:** Types of energy, Law of Conservation of Energy, transfer vs transformation, formulas
- **Matter:** Classification of matter, atoms, periodic table, chemical vs physical changes
- **Earth Science:** Weathering vs erosion, rock cycles, weather vs climate, volcanoes and earthquakes, Earth's changing surface