

COURSE SYLLABUS
Fall Semester 2018

EXP ENG 5914 – Explosives Manufacturing
Department of Mining and Nuclear Engineering
Missouri University of Science and Technology

Number of Credit Hours: 3 Hours
Meeting time: Distance
Meeting location: Distance

Instructor: Dr. Kyle A. Perry, P.E.
Office: B55 McNutt / 107 KEM
Phone: 573-341-4549
Email: kperry@mst.edu

Course Description: History of industrial explosives from discovery to what is used today. Manufacturing processes for packaged and bulk explosives are explored along with specialty explosives such as detonating cord, cast boosters, detonators, shaped charges, and commercial fireworks. Field manufacturing of explosives by mixing or gassing is also covered.

Prerequisites: None

Course Goals: Upon conclusion of this course, students will have the knowledge of how explosives are manufactured. Students will understand key features, properties, and performance of explosives and their importance.

Textbook: None. Notes distributed throughout semester.

References: ISEE Blasters' Handbook 18th Edition, ISBN: 9781892396198
Explosives Engineering, P. Cooper, ISBN: 0471186368
Introduction to the Technology of Explosives, P. Cooper, ISBN: 047118635X

Course Format: The course is broken down into Modules in Canvas. Each module covers a specific topic and has lectures, videos, quizzes, homeworks, etc. associated with it. Each module will take 1-3 weeks depending on the topic. Students will follow along with the instructor as he goes through the modules and will not be allowed to "jump ahead" of the rest of the class.

Course Topics: History of Industrial Explosives (Module 1)
Explosive Raw Materials (Module 2)
Explosive Sensitizers (Module 3)
Basic Explosive Theory (Module 4)
Water Resistant Explosives (Module 5)
Initiating System Explosives (Module 6)
Field measurement of explosives (Module 7)
Product analysis in the field (Module 8)
Specialty products (Module 9)
Building an emulsion from basics (Module 10)

Course Homeworks: Homeworks will be assigned throughout the semester. Homework grades will be reduced 20% for each day they are late unless prior arrangements have been made. Each homework will be due at the time specified on the homework.

Course Projects: A research paper is required of all students on an explosives related topic.

Course Grading:

Grade Components		Grade Scale	
Homework	20%	90 - 100 %	A
Quizzes	20%	80 - 89.9%	B
Research Paper	20%	70 - 79.9%	C
Mid-Term Exam	20%	60 - 69.9%	D
Final Exam	20%	< 60%	E

Exams: A midterm and comprehensive final exam will be given. The midterm will cover modules 1-5. The professor reserves the right to alter/adjust the modules covered on each exam.

Student Regulations: Missouri S&T's "Student Academic Regulations" is available at this website. <http://registrar.mst.edu/academicregs/> All students are encouraged to review the sections

Disability Support: If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation. <http://dss.mst.edu/>

Academic Dishonesty: This includes cheating, plagiarism, or sabotage. If you have any questions regarding these issues, please contact Dr. Jeff Cawlfeld, Vice Provost, Office of Academic Support, at jdc@mst.edu.

From the Office of Academic Support

- **Title IX**

Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises. Missouri S&T's Title IX Coordinator is interim chief diversity officer Neil Outar. Contact him (naoutar@mst.edu; (573) 341-6038; Temporary Facility A-1200 N. Pine Street) to report Title IX violations. To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit <http://titleix.mst.edu>.

- **Student Honor Code and Academic Integrity:**

Please take a few minutes to stress the importance of academic integrity in class. Discuss why it should matter to the student, why it matters to you and your discipline, why it matters to Missouri S&T, and why it matters to future employers. Include a statement on your syllabus about the Honor Code developed and endorsed by the Missouri S&T Student Council: the Honor Code can be found at this link: <http://stuco.mst.edu/honor-code/>. Encourage students to read and reflect upon the Honor code and its emphasis on HONESTY and RESPECT. Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the University of Missouri System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage (<http://registrar.mst.edu/academicregs/index.html>). Additional guidance for faculty, including the University's Academic Dishonesty Procedures, is available on-line at <http://academicsupport.mst.edu>. Other informational resources for students regarding ethics and integrity can be found online at <http://academicsupport.mst.edu/academicintegrity/studentresources-ai> .

- **S&Tconnect:** <https://canvas.mst.edu/> (S&Tconnect icon on left toolbar)

Office of Academic Support • 105 Norwood Hall • 320 West 12th Street • Rolla, MO 65409-1520 Phone: 573-341-7276
• Email: ugs@mst.edu • Web: <http://ugs.mst.edu/> *An equal opportunity institution*

S&Tconnect provides an enhanced system that allows students to request appointments with their instructors and advisors via the S&Tconnect calendar, which syncs with the faculty or staff member's Outlook Exchange calendar. S&Tconnect will also facilitate better communication overall to help build student academic success and increase student retention. S&Tconnect Early Alert has replaced the Academic Alert system used by Missouri S&T. If training is needed, please contact Rachel Morris at rachelm@mst.edu or 341-7600.

• **Classroom Egress Maps:**

Faculty should explain where the classroom emergency exits are located. Please include a statement in your course syllabus asking the students to familiarize themselves with the classroom egress maps posted on-line at: <http://designconstruction.mst.edu/floorplan/>.

• **Accessibility and Accommodations:**

It is the university's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please contact Student Disability Services at (573) 341- 6655, [sdsms@mst.edu](mailto:sdsmst@mst.edu), visit <http://dss.mst.edu/> for information, or go to mineraccess.mst.edu to initiate the accommodation process.

**Please be aware that any accessible tables and chairs in this room should remain available for students who find that standard classroom seating is not usable.*

• **LEAD Learning Assistance** <http://lead.mst.edu>

The Learning Enhancement Across Disciplines Program (LEAD) sponsors free learning assistance in a wide range of courses for students who wish to increase their understanding, improve their skills, and validate their mastery of concepts and content in order to achieve their full potential. LEAD assistance starts no later than the third week of classes. Check out the online schedule at <http://lead.mst.edu/assist>, using zoom buttons to enlarge the view. Look to see what courses you are taking have collaborative LEAD learning centers (bottom half of schedule) and/or Individualized LEAD tutoring (top half of the schedule). For more information, contact the LEAD office at 341-7276 or email lead@mst.edu.

• **The Student Success Center**

The Student Success Center is a centralized location designed for students to visit and feel comfortable about utilizing the campus resources available. The Student Success Center was developed as a campus wide initiative to foster a sense of responsibility and self-directedness to all S&T students by providing peer mentors, caring staff, and approachable faculty and administrators who are student centered and supportive of student success. Visit the SSC at 198 Toomey Hall; 573-341-7596; success@mst.edu; facebook: www.facebook.com/SandTssc; web: <http://studentsuccess.mst.edu/>

If you have any questions about the information listed above, please contact the Office of Academic Support at 573-341-7276.