1. **Course Description**

2. **Prerequisites**
Preceded or accompanied by Min Eng 3913

3. **Textbook** (Compulsory)

Other References

4. **Outcomes tied to ABET (1) – (7):**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Program Outcome</th>
<th>Implementation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will be able to use engineering principles, method selection, economics and production efficiency and equipment selection to properly design an effective underground mine system.</td>
<td>(1), (2), (3), (4), (5)</td>
<td>Assignments and Examination</td>
</tr>
<tr>
<td>Detailed introduction of different underground mining methods, system layouts, equipment selection and effective development and production methods.</td>
<td>(2), (3), (4), (7)</td>
<td>Assignments and Examination</td>
</tr>
<tr>
<td>Use of article reviews and field trip report to identify, formulate and solve closed- and open-ended problems in mining systems, equipment selection and engineering problems in underground mining methods.</td>
<td>(1), (2), (3), (4)</td>
<td>Assignments and Field Trip</td>
</tr>
</tbody>
</table>

5. **Grading Policy:**

<table>
<thead>
<tr>
<th></th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Homework</td>
<td>35%</td>
<td>25%</td>
</tr>
<tr>
<td>Class attendance</td>
<td>5%</td>
<td>NA</td>
</tr>
<tr>
<td>Optimization</td>
<td>NA</td>
<td>25%</td>
</tr>
</tbody>
</table>

Two major exams (30% each for undergraduate students and 25% each for graduate students): mid-semester exam and final exam.

There will be homework problems approximately every couple of topics. Homework assignments are due one week from the date assigned. There will be a 10% reduction for each day after the due date to a maximum of 3 days. No work will be accepted after three days.

There will also be a possibility of field trip; the trip report will count for one homework.
Grades (A ≥ 90, B = 80 – 89, C = 70 – 79, D = 60 – 69 & F ≤ 60)

6. Course TA: Raymond Tiile rntzq7@mst.edu 201 Missouri Enterprise Bldg.

7. Course Topics

Introduction and Mine Planning Lessons
1. Introduction; underground mine terminologies;
2. Underground method overview;
3. General mine planning; design considerations; and production estimation.

Mining Methods Lessons
4. Room and Pillar Stoping (R&P);
5. Sublevel Open Stoping (SLOS);
6. Vertical Crater Retreat (VCR);
7. Shrinkage Stoping;
8. Cut and Fill Stoping (C&F);
9. Sublevel Caving Systems;
10. Block Caving;
11. Longwall Stoping.

Mine Auxiliary Operations and Other Topics (within lessons)
12. Sampling, dilution, and recovery
13. Ground control
14. Grouting and shotcreting
15. Drilling (materials applicable to underground mining)
16. Ore passes
17. Mechanical excavation – roadheaders, continuous miners and TBMs
18. Shaft sinking and raise boring
19. Mine backfill

Case histories (supplemented with reading assignments)

8. Important Information for Course Syllabi, 2017-2018 Academic Year

Student Honor Code and Academic Integrity: Honor Code developed and endorsed by the Missouri S&T Student Council can be found at this link: [http://stuco.mst.edu/about/honor.shtml](http://stuco.mst.edu/about/honor.shtml). 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 and all forms of academic dishonesty must be avoided at all times ([http://registrar.mst.edu/academicregs/index.html](http://registrar.mst.edu/academicregs/index.html)). Other informational resources for students regarding ethics and integrity can be found online at [http://ugs.mst.edu/academicintegrity/studentresources.ai](http://ugs.mst.edu/academicintegrity/studentresources.ai).

S&Tconnect: [https://blackboard.mst.edu/](https://blackboard.mst.edu/) S&Tconnect provides an enhanced system that allows students to request appointments with their instructors and advisors via the S&Tconnect calendar.

In Case of Emergency, Classroom Egress Maps: Faculty and Students should familiarize themselves with the classroom egress maps posted on-line at: [http://designconstruction.mst.edu/floorplan/](http://designconstruction.mst.edu/floorplan/)

Disability Support Services: [http://dss.mst.edu](http://dss.mst.edu) (dss@mst.edu) 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.

LEAD Learning Assistance [http://lead.mst.edu](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. Check out the online schedule at [http://lead.mst.edu/assist](http://lead.mst.edu/assist)

The Burns & McDonnell Student Success Center: 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 B&MSSC at 198 Toomey Hall; 573-341-7596; success@mst.edu; Facebook: www.facebook.com/SandTssc; web: [http://studentsuccess.mst.edu/](http://studentsuccess.mst.edu/)

Title IX Statement: 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 contact information (napoutar@mst.edu; (573) 341-6038; After Hours: (573) 202-4185 Centennial Hall) to report Title IX violations. To learn more about Title IX resources and reporting options (confidential and non-confidential) please visit [http://titleix.mst.edu](http://titleix.mst.edu).

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