1. **Course Number and Name**
   
a. **CENG 3352**: Introduction to Environmental Engineering, Fall 2020
   
b. Section 010, TR 8:00 – 8:50 am
   
c. Laboratory section 01Z, W 11:00 am – 1:50 pm; section 02Z M 11:00 am – 1:50 pm

2. **Credits and Contact Hours**
   
a. **Credits**: 3
   
b. **Contact Hours**: 2 hours/week (Classroom) 3/hours/week (Lab)

3. **Instructor Information**
   
a. **Course Coordinator**: Aldo R. Pinon-Villarreal
   
b. **Instructor**: Aldo R. Pinon-Villarreal, 325-486-5510, apinonvillarreal@angelo.edu. Office: VIN 272. For office hours see faculty homepage.

**Instructions to join the virtual office hour sessions (simultaneous with face to face office hrs):**

1. In your Blackboard go to the Home tab then go to *My organizations* module
2. Select *Engineering Community* Organization, which looks like a regular course blackboard page.
3. On the organization menu, select *Virtual Engineering Hub* which takes you to a Collaborate Ultra virtual meeting room.
4. In there, find the correct Office Hours Session series in the scheduled Collaborate sessions (e.g., *Prof. Pinon Tuesdays Office Hours*)
5. Fifteen min before the session starts (and during the session) you will be able to join the session. Choose your role as *participant*.

4. **Course Materials:**
   
a. **Required Textbook:**
      - Top Hat Pro ([www.tophat.com](https://www.tophat.com)) will be used for class participation. Cost of Top Hat Pro is $22 per semester. If you already have Top Hat account, go to [https://app.tophat.com/e/466057](https://app.tophat.com/e/466057) to be taken directly to our course. If you are new to Top Hat, go to [https://app.tophat.com/register/student](https://app.tophat.com/register/student) and search for our course with the following join code: 466057. For more instructions refer to the invitation sent to your school email address or consult Top Hat’s Getting Started Guide ([https://bit.ly/31TGMIw](https://bit.ly/31TGMIw)). For questions or support send an email to support@tophat.com, use the in-app support button, or call 1-888-663-5491.
b. **Software**
   None.

c. **Other Supplemental Materials**: Posted on Blackboard® Learning Management System

5. **Specific Course Information**

a. **Catalog Description**: Introduction to environmental problems, water quality indicators and requirements, potable water quality and quantity objectives, water sources and treatment methods; water pollution control objectives and treatment methods; solid waste management and introduction to air pollution control.

b. **Prerequisites and Corequisites**: Prerequisites: CHEM 1411
   Completion or Concurrent Enrollment: ENGR 2302

c. **Required or Elective**: Required (satisfies Introductory CE Discipline)

6. **Specific Goals for the Course**

a. Course Learning Outcomes:
   1. Calculate partitioning coefficient of pollutants in environmental compartments
   2. Estimate Fate of pollutants in the environment
   3. Recognize contaminant transport mechanisms from a source to a recipient
   4. Calculate the speed of contaminant transport in the environment
   5. Calculate risk of contaminants
   6. Describe Environmental Law
   7. Distinguish between groundwater remediation technologies
   8. Distinguish waste disposal/ containment systems

b. Course Learning Outcome Mapping to ABET Criterion 3 Student Outcomes:

Table 1: Course Learning Outcomes mapped to ABET Student Outcomes

<table>
<thead>
<tr>
<th>ABET Student Outcomes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Solve Problems</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Communication</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ethics &amp; Professionalism</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Teamwork</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Experimentation</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Acquire New Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
7. Topics Covered
   1. Multimedia partitioning of environmental pollutants
   2. Fate and transport of pollutants: CSTR, PFR, MFR
   3. Risk assessment
   4. Environmental regulations
   5. Physical, chemical and biological processes in water and wastewater treatment
   6. Groundwater remediation
   7. Waste containment systems
8. Course structure and communication

**NOTE:** the course format could change without prior notice from a blended format to an online format if ASU dictates that courses need to be taught remotely in the event that COVID-19 cases pose a serious threat to the University Community.

The course is a mixture between face to face and online formats. Class sessions will be face to face. All lectures will be recorded and uploaded to blackboard within 24 hrs. for those who may not be able to attend. Some parts of the lecture such as laboratory or project assignments may be provided via video webcasts posted in blackboard asynchronously. The instructor will be holding face to face and online synchronous sessions simultaneously during published office hours.

You are expected to complete all required reading and video webcasts independently before each class period. Please bring the textbook, any relevant handouts and a calculator with you to the class. You are also expected to collaborate with peers virtually for online assignments and to communicate frequently with your instructor for any questions or clarifications you may have. All lesson materials will be organized on the Blackboard course website. Important course announcements and changes will be sent via Blackboard. Students are expected to regularly check their Angelo State University email for these messages.

Academic integrity is expected from all students at all times in accordance with Part I, Section B.1² of the Angelo State University Code of Student Conduct. Respect for your fellow classmates in the face to face or online environments is required. While online do not act in a manner that perturbate others.

8.1 Calculator policy

The use of a calculator is required and allowed on all tests and quizzes. Computers, tablets, smart phones, i-Pads and similar electronics are not allowed on tests/quizzes. Calculators with graphing capabilities will be allowed in the course. Recommended calculators with these capabilities include the HP48, HP49, HP50, TI86, and TI89. However, only calculators currently allowed in the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams will be allowed in tests and quizzes. Please refer to the NCEES calculator policy³ for the list of acceptable calculators.

8.2 Professionalism

Professional engineering standard apply in this class. You are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. You are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) demonstrate sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accept constructive criticism in a productive manner; (6) demonstrate an attitude that fosters professional behavior among peers and faculty; (7) be punctual to class meetings; (8) maintain a good work ethic and integrity; and (9) recognize the classroom as a professional workplace.
9. Graded Material

9.1 In-Class Problems
You will be able to submit answers to in- or after-class questions using any smartphone, tablet or laptop using Top Hat Pro. The In-class short problems will be presented during synchronous sessions and will remain open until the next day by midnight. These are short examinations of varying formats containing multiple choice, calculation and short answer questions. The purpose of the in-class problems is to encourage you to participate actively in class or complete the reading and web-based material. Your lowest score will be dropped.

9.2 Homework
Homework assignments are designed to demonstrate problem-solving, analytical, and critical thinking skills. These will consist of textbook problems or self-reflection essays after completing a reading or watching a video. The problem solving exercises require you to scan the assignment (or type it), convert it to pdf and upload it to blackboard using Gradescope. Due dates for Homework assignments will be listed in Bb.

9.3 Laboratory Reports
You must pass the lab portion of the class as a whole in order to pass the course. Weekly laboratory sessions will be undertaken to research lab analytical equipment, design and conduct experiments or work on a project. The instructor will post the handouts for every lab in Bb at least one week in advance of the session. Ensure to read them in advance to be prepared for the lab activity and to answer any pre-lab online quiz. Most sessions require submission of a professionally written report submitted as a team. 10% of the lab report grade will be based on a self and peer evaluation. Unless stated otherwise each lab report will be due at the beginning of the lab session, one week after the lab is completed.

9.4 Projects
This is a three-person team project assignment. Two projects will be assigned with the purpose of prompting each team to research a current and local environmental issue and discuss potential ways the local communities can overcome or solve this issue. Your team will present your final proposed solution in both a written report and an oral presentation. Due dates will be listed in Blackboard. Online group discussions are highly encouraged to keep physical contact to a minimum.

9.5 Exams
There will be a total of two partial and one comprehensive final exam required to pass the course. All the exams are closed-notes. You will be allowed to use the NCEES approved calculator during the exams.

9.6 Late Assignments
No late assignments or missed assignments will be accepted unless a prior arrangement has been made with the instructor. All arrangements must be accompanied by a memorandum containing (i) the reason for the late submission, (ii) specific preventive action(s) to ensure the situation, if preventable, does not repeat in the future, and (iii) a proposed new timeline for the submission. Acceptance of the terms and grade deduction for late assignment is at the discretion of your instructor.
9.7 Grade Weighting and Letter Grades

The weighting system shown in Table 2 will be used in determining final grade for the course.

Table 2: Grade Weighting

<table>
<thead>
<tr>
<th>Item</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-class problems (Top Hat)</td>
<td>10%</td>
</tr>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Laboratory Reports</td>
<td>20%</td>
</tr>
<tr>
<td>Projects</td>
<td>15%</td>
</tr>
<tr>
<td>Partial Exams (2)</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

The instructor will determine letter grades for the course using his professional judgment, and the following standards as described in the University Catalog:

A = excellent work (> 89%), B = good work (80-89%), C = average work (70-79%), D = poor work (60-69%), F = failing work (< 60%).

10. Classroom and University Policies and Student Support

10.1 General Policies

All students are required to follow the policies and procedures presented in the Angelo State University Student Handbook and Angelo State University Catalog.

10.2 Student Disability Services

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student’s responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the Student Disability Services website. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112
10.3 Title IX at Angelo State University

The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Face to face: Mayer Administration Building, Room 210
325-942-2022, michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information about Title IX in general you may visit www.angelo.edu/title-ix.

10.4 Observance of Religious Holy Day

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

10.5 Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

10.6 Student Conduct Policies

10.6.1 Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university’s Statement of Academic Integrity

10.6.2 Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.
Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center11.

10.6.3 Copyright Policy
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

11. Instructor Prerogative
The instructor reserves the right to change the policies and procedures of this course when he deems it necessary. Any such changes will be implemented fairly and will typically not be a detriment to your grade. The instructor will notify you of any such changes in a timely manner.

12. Format of Homework Assignments and Laboratory Reports
Hand written assignments must be completed on engineering paper using the format shown in Figure 1 before being scanned and submitted via Gradescope. All pages must be numbered and contain the header information shown in Figure 1. Work completed using a computer may be submitted on regular 8 x 11 in. paper. All equations should be typed using the insert equation button from the main menu bar in word® or a specialized mathematics typing application or software.

Every lab report will require a cover page containing the student name, names of team members, as well as course name, instructor name, date when experiment/analysis was undertaken, and report submission date. See handout Grading and Formatting of Lab reports in the Orientation Module in Bb for detailed information about report format and expectations.
Given: Perez & Rabinowitze prob. 6-13

A ship on a lake is sighted from 2 stations located 521.67′ apart, along an E-W baseline. The azimuth measured from the western most station is 30°17′33″.

The azimuth measured from the eastern most station is 321°47′08″.

Find: The distance from the baseline to the ship.

Solution:

\[ \angle a = 90° - 30°17′33″ = 59°42′27″ \]
\[ \angle b = 321°47′08″ - 290° = 51°47′08″ \]
\[ \angle p = 180° - \angle a - \angle b \]
\[ = 180° - 59°42′27″ - 51°47′08″ \]
\[ = 69°30′15″ \]

Using law of sines
\[ \frac{AP}{\sin p} = \frac{521.67′}{\sin b} \]

Figure 1: Required format for handwritten homework
13. **Course Outline**

The course outline is presented in Table 3 and the schedule for Lab Activities is presented in Table 4. Detailed reading and homework assignments along with updates to this schedule will be provided via Bb. The following schedule may be modified as the semester progresses.

**Table 3: Course Lecture Schedules**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Date</th>
<th>Topic</th>
<th>Textbook Reading</th>
<th>Laboratory Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T, 08/18</td>
<td>Introduction</td>
<td>Chapter 1</td>
<td>Lab 1: Safety procedures</td>
</tr>
<tr>
<td>2</td>
<td>R, 08/20</td>
<td>Units of concentration</td>
<td>Chapter 1; Handout</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>T, 08/25</td>
<td>Nature of pollutants</td>
<td>Chapter 2</td>
<td>Lab 2: Environmental lab instruments</td>
</tr>
<tr>
<td>4</td>
<td>R, 08/27</td>
<td>Nature of pollutants</td>
<td>Chapter 2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>T, 09/01</td>
<td>Partition coefficients: Kaw</td>
<td>Chapter 3</td>
<td>Lab 2: Identifying pollutants</td>
</tr>
<tr>
<td>6</td>
<td>R, 09/03</td>
<td>Partition coefficients: Kaw</td>
<td>Chapter 3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>T, 09/08</td>
<td>Partition coefficients: Kam</td>
<td>Chapter 3</td>
<td>Lab 3: Contaminant partition- Design</td>
</tr>
<tr>
<td>8</td>
<td>R, 09/10</td>
<td>Partition coefficients: Kd</td>
<td>Chapter 3</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>T, 09/15</td>
<td>Partition coefficients: BCF</td>
<td>Chapter 3</td>
<td>Lab 3: Contaminant partition- Design</td>
</tr>
<tr>
<td>10</td>
<td>R, 09/17</td>
<td>Transport: CSTR</td>
<td>Chapter 3, 5, 8</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>T, 09/22</td>
<td>Transport: CSTR/PFR</td>
<td>Chapter 3, 5, 8</td>
<td>Lab 4: Contaminant transport- Design</td>
</tr>
<tr>
<td></td>
<td>R, 09/24</td>
<td>Test 1 (Lectures 1-9)</td>
<td>Chapter 3, 5, 8</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>T, 09/29</td>
<td>Transport: PFR</td>
<td>Chapter 3, 5, 8</td>
<td>Lab 4: Contaminant transport- Design</td>
</tr>
<tr>
<td>13</td>
<td>R, 10/01</td>
<td>Transport: MFR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>T, 10/06</td>
<td>Environmental law</td>
<td>Chapter 13</td>
<td>Lab 5: Waterways</td>
</tr>
<tr>
<td>15</td>
<td>R, 10/08</td>
<td>Environmental law</td>
<td>Chapter 13</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>T, 10/13</td>
<td>Risk assessment</td>
<td>Lecture Slides</td>
<td>Lab 6: Risk assessment</td>
</tr>
<tr>
<td>17</td>
<td>R, 10/15</td>
<td>Risk asmt: Exposure routes</td>
<td>Lecture Slides</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>T, 10/20</td>
<td>Risk asmt: Effective dose</td>
<td>Lecture Slides</td>
<td>Lab 6: Water quality measures</td>
</tr>
<tr>
<td>19</td>
<td>R, 10/22</td>
<td>Water treatment</td>
<td>Lecture Slides</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>T, 10/27</td>
<td>Wastewater treatment;</td>
<td>Lecture Slides</td>
<td>Lab 7: Project presentations</td>
</tr>
<tr>
<td></td>
<td>R, 10/29</td>
<td>Project report due</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>R, 11/03</td>
<td>Groundwater remediation;</td>
<td>Lecture Slides</td>
<td>Lab 8: Remediation</td>
</tr>
<tr>
<td>22</td>
<td>R 11/05</td>
<td>Case study: physical/chemical</td>
<td>Lecture Slides</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>T, 11/10</td>
<td>Case study: biological</td>
<td>Lecture Slides</td>
<td>Lab 9: Lab Design presentations</td>
</tr>
<tr>
<td>24</td>
<td>R, 11/12</td>
<td>Landfill design</td>
<td>Lecture Slides</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>T, 11/17</td>
<td>Case study</td>
<td>Lecture Slides</td>
<td>Open lab</td>
</tr>
<tr>
<td>26</td>
<td>R, 11/19</td>
<td>Review</td>
<td>Lecture Slides</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Final Exam (Lectures 18-25)</td>
</tr>
</tbody>
</table>
End Notes

1 https://ncees.org/engineering/fe/
3 http://ncees.org/exams/calculator-policy/
4 http://www.angelo.edu/student-handbook/
5 http://www.angelo.edu/catalogs/
6 http://www.angelo.edu/services/disability-services/
7 http://www.angelo.edu/incident-form
8 http://www.angelo.edu/title-ix
9 http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
10 http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php
11 http://www.angelo.edu/dept/writing_center/academic_honesty.php