

**CIVE285 – Civil Engineering Materials****Term – Summer 2020 (202005)**

We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

**Instructor name: Dr. Pejman Azarsa**

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Office: Kryton International Inc.

**Office Hours**

Days: W &amp; F

Time: 8:30 – 9:30 AM

Location: Online

**List all prerequisites and co-requisites:** MATH 100, CHEM 101 or 150, PHYS 110 or 122, 111 or 125**Course Objectives:**

Influence of constituent materials on the properties of fresh and hardened concrete. Concrete mix design. Impact of loads and environment on behavior of concrete. Properties of asphalt cement and aggregates; properties and design of asphalt concrete; Stresses in flexible and rigid pavements. Pavement failures. Material lifecycles. Use of innovative materials including polymer composites, advantages and limitations.

**Learning Outcomes:**

- Differentiate between the types of Portland cement, and explain the Portland cement hydration process.
- Identify and explain the use of supplementary cementing materials and chemical admixtures.
- Determine constituent material proportions for standard Portland cement concrete mixtures.
- Explain the basic procedures involved in batching, mixing, transporting, handling, placing, finishing, and curing Portland cement concrete.
- Conduct laboratory tests on Portland cement concrete while developing an understanding of the effect of water/cement ratio and curing methods on concrete strength.
- Identify the sources, types, properties, and uses of asphaltic cements.
- Conduct basic asphalt cement tests and other tests on asphalt concrete.
- Describe the various layers and calculate stresses in flexible pavements.
- State the basics of Marshall and Superpave design method.
- Describe the fundamentals behind development of composites and its effect on pavement life.

**Syllabus:****Lecture Date(s)**

<b>Section:</b> A/CRN 30122	<b>Days:</b> F*	<b>Time:</b> 10:30 - 13:20	<b>Location:</b> Online
<b>* It should be noted that most of lectures are prerecorded and will be available on UVic Coursespaces.</b>			

### Tutorial Sections

<b>Section:</b> T	<b>Days:</b> W	<b>Time:</b> 13:30 – 14:20	<b>Location:</b> Online
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### Lab Sections

<b>Section:</b> B	<b>Days:</b> Check the course timetable	<b>Time:</b> Check individual sections	<b>Location:</b> Online
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TA Name	E-mail	Office
Mian Huang	<a href="mailto:huangmian1988@outlook.com">huangmian1988@outlook.com</a>	
Maryam Monazami	<a href="mailto:maryam.monazami@gmail.com">maryam.monazami@gmail.com</a>	
Boyu Wang	<a href="mailto:Boyuwang@uvic.ca">Boyuwang@uvic.ca</a>	

Required Text	Optional text
<b>Title:</b> Design and Control of Concrete Mixtures	<b>Title:</b> Pavement Analysis and Design
<b>Author:</b> Kosmatka et al	<b>Author:</b> Huang Y. H
<b>Publisher:</b> Cement Association of Canada (2011, 8 <sup>th</sup> edition)	<b>Publisher:</b> Pearson, 2004

#### Reference Materials:

- CSA A23.1-09 & A23.2-09 Concrete Materials & Methods of Concrete Construction / Methods of Test for Concrete (check for availability in the library)
- S. Mindess, J.F. Young, D. Darwin, Concrete, 2<sup>nd</sup> Edition, Prentice Hall, 2003 (available in the library reserve)
- ACI Materials Journals and Concrete International, Monthly publication by ACI (online for student members)
- The Asphalt Handbook (7 Edition, MS-4): Asphalt Institute: Canadian Technical Asphalt Association, KY, USA. (available in the library reserve)


#### Other learning resources:

##### Required:

- ASTM standards: A student package created with 10 standards on asphalt, cement, and concrete (Instructions to be provided by the instructor)
- Lab/safety gear: Lab coats are mandatory for all labs. For some lab sessions it is recommended that you wear old clothes and rubber boots. Safety glasses are required, and CSA approved steel toed shoes are highly recommended.
- Valid WHMIS training (Instructions to be provided by the instructor)

Assessment	Weight	Date
Assignments/Projects	15%	TBA
Labs and tutorials: reports, quizzes, and safety	15%	TBA
Mid-term 1	25%	TBA
Mid-term 2	30%	TBA
Mid-term 3	15%	TBA

**Assignments: (Include Assignment Schedule) (Description & Method of Delivery)**

Assignment #	Modules	Start	Due (5 PM)
L1	LAB REPORT on Aggregates	TBA	TBA
L2	LAB REPORT on asphalt and SUPERPAVE	TBA	TBA
L3	LAB REPORT on w/cm ratio experiment	TBA	TBA
 <b>Students will be required to complete three lab assignments. Details and submission dates will be confirmed in class.</b>			



**Laboratories: (Description & Method of Delivery)**

Lab #	Modules	Start	Due (5 pm)
1	Library resources for CIVE 285 at the Library (Aditi Gupta)	TBA	TBA
2	Safety demonstration (quiz- online), Aggregate prep and testing	TBA	TBA
3	Demo on Marshal Method (video)/ Superpave (video)	TBA	TBA
4	Concrete - w/c lab: mixing and casting	TBA	TBA
5	Grinding demo, Grinding cylinders, 14d & 28d testing, calculations	TBA	TBA

**Projects: (Description & Method of Delivery)**

 Details of the project and submission date will be confirmed in class.

**NOTE: (sample notes for all instructors)**

-  Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.
-  Failure to pass the final exam will result in a failing grade for the course.

**Course Lecture Notes:**

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

**Course Withdrawal Deadlines:**

- May 16: Withdrawal with 100% reduction of tuition fees
- June 6: Withdrawal with 50% reduction of tuition fees
- July 1: Last day for withdrawal (no fees returned)

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar.

**There will be no supplemental examination for this course.**

**Grading:** Please see the Grading information in the current calendar at: <https://www.uvic.ca/calendar2020-05/undergrad/index.php/home#/policies>

**Course policies and guidelines**

**Late Assignments:** *No late assignments will be accepted unless prior arrangements have been made with the instructor at least 48 hours before the assignment due date.*

**Coursework Mark Appeals:** *All marks must be appealed within 7 days of the mark being posted.*

**Attendance:** We expect students attend all lectures and labs. It is entirely the students' responsibility to recover any information or announcements presented in lectures from which they were absent.

**Electronic devices in labs and lectures:** No unauthorized *audio* or *video* recording of lectures is permitted.

**Electronic devices in midterms and exams:** Calculators are only permitted for examinations and tests if explicitly authorized and the type of calculator permitted may be restricted. No other electronic devices (e.g. cell phones, pagers, PDA, etc.) may be used during examinations or tests *unless explicitly authorized.*

**Plagiarism:** Submitted work may be checked using plagiarism detection software. Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the link given below for the UVic policy on academic integrity. Note that the university policy includes the statement that "*A largely or fully plagiarized assignment should result in a grade of F for the course.*"

**Academic Integrity:** You must make yourself aware of the University of Victoria guidelines and policy concerning fraud and academic integrity at this link, <https://www.uvic.ca/current-students/home/academics/academic-integrity/index.php>

**Policy on Academic Integrity:** <https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policies>

**Standards of Professional Behaviour:** You are advised to read the Faculty of Engineering Document Standards for Professional Behaviour in current Undergraduate Calendar, which contains important information regarding conduct in courses, labs, and in the general use of facilities. Please find the document at this link: <https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

**Notes to Students:**

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

**University of Victoria Privacy Policy:** If any student has concerns about their private information being stored or accessed outside of Canada, they are required to inform the course instructor about their concerns before the end of second week of classes.

**Accommodation of Religious Observance:** See entry in current Undergraduate Calendar.

**Equality:** This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed

to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building, <https://www.uvic.ca/services/cal/>.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

**Sexualized Violence Prevention and Response at UVic:** UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting [www.uvic.ca/svp](http://www.uvic.ca/svp). If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

**Where:** Sexualized violence resource office in EQHR; Sedgewick C119

**Phone:** 250.721.8021

**Email:** [svpcoordinator@uvic.ca](mailto:svpcoordinator@uvic.ca)

**Web:** [www.uvic.ca/svp](http://www.uvic.ca/svp)

**Policy on Inclusivity and Diversity:** See the entry in the current Undergraduate Calendar.

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#### Syllabus statement

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

**Counselling Services** - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.*

<https://www.uvic.ca/services/counselling/>

**Health Services** - *University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives.* <http://www.uvic.ca/services/health/>

**Centre for Accessible Learning** - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations* <https://www.uvic.ca/services/cal/>. *The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.*

**Elders' Voices** - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being.*

<https://www.uvic.ca/services/indigenous/students/programming/elders/index.php>

The [Office of the Ombudsperson](#) is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The

Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations.  
Phone: 250-721-8357; Email: [ombuddy@uvic.ca](mailto:ombuddy@uvic.ca); Web: [uvicombudsperson.ca](http://uvicombudsperson.ca).

## Tentative Lecture & Lab Schedule

Lecture (week of)	Topics Covered	Relevant Reading*	Recommended Problems	Lab/Tutorials
May 4 – 10	Introduction to course, materials, and Properties of aggregates	Chapter 6	See handout	
May 11 – 17	Introduction to Pavement Systems / Terminology	Refer to handouts		Library resources for CIVE 285 – (Aditi Gupta) - Online
May 18 – 24	Asphalt technology / Flexible Pavements Stresses, strains and design	Refer to handouts		Safety demo ( <b>quiz- online</b> ), Aggregate prep and testing
May 25 – 31	Flexible Pavements- Stresses, strains and design	Refer to handouts		Demo on Marshal Method (video)/ Superpave (video)
June 1 – 7	Overlay Design- Marshall Method /Superpave <b>Exam 1 (TBC)</b>	Refer to handouts		
June 8 – 14	Placing, Compaction, condition assessment/ Pavement Failures Introduction to concrete	Chapter 1 Chapter 3	See handout	Concrete - w/c lab: mixing and casting
June 15 – 21	<b>(Guest Speaker-Special topic on Concrete and Asphalt)</b>			
June 22 – 28	Portland Cements; Hydration; <b>Assign Project</b> ; Supplementary Cementing Materials, Chemical admixtures / Mix proportioning	Chapter 4 & 7 Chapter 12	See handout	Grinding demo, Grinding cylinders, 14d & 28d testing, calculations
June 29 – July 5	<b>Exam 2</b> , Mix Proportioning			
July 6 – 12	Batching, Mixing, Transporting and Handling Concrete Placing, Finishing, and curing concrete	Chapter 13 Chapter 14	See handout	
July 13 – 19	Properties of hardened concrete	Chapter 18	See handout	
July 20 – 26	Properties of hardened concrete / Effect of environment on properties of concrete	Chapter 9 & 11	See handout	
July 27 – Aug. 2 <b>Last day of class: July 31</b>	Recent trends in materials engineering and sustainable composites <b>Exam 3 and Project submission</b>			

\* “Chapters” are from DCCM