

# AHMAD MOHAMMADPANAHAH

**Ph.D., P.Eng.**

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## Education

**2015, Ph.D.** (Mechanical Engineering, University of British Columbia, Canada)

**2011, M.A.Sc.** (Mechanical Engineering, University of British Columbia, Canada)

**2005, M.Sc.** (Applied Mechanics, Sharif University of Technology, Tehran, Iran)

**2001, B.Sc.** (Applied Mechanics, Ferdowsi University, Mashhad, Iran)

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## Professional Qualifications

- **(Since 2016)** P.Eng. License, Engineers and Geoscientists BC
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## Continuing Education / Training

- **2020**, Intense 24 hours Instructional Skills Workshop Certificate
  - **2020**, TDP Certificate (Completed the 9-month training TDP (Teaching Development Program)).
  - **2014**, CTLT Certificate, "Teaching and Presentation Skill"
  - **2014**, "Adaptive Leadership and Communication Skill", (Special courses at UBC, Directed Studies in Conservation)
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## Awards and Recognitions

**2019** Win Project in Science and Technology, Category: Innovation Recognition Program, Design of a Passive Flow Valve/Balancer

**2017** Recognition for design and development of an unconventional guide bearing for circular saws, FPInnovations

**2016** Recognition for design and development of a unique circular saw temperature sensor, FPInnovations (patented - US 2019/0353535 A1)

**2012** Faculty of Applied Science Graduate Award, University of British Columbia

**2001** The outstanding student award, Bachelor, Applied Mechanics, Ferdowsi University, Iran

**2009** Outstanding Instructor in Nasir Institute, KNT University, Tehran, Teaching Dynamics, and Vibration

**2006** Outstanding Instructor in Sattary University, Tehran, Teaching Dynamics, Vibration, and Mechanics of Material

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## Teaching Experience

### Courses at UBC (2018 - current)

- Mechanics of Materials I (Mech 260)
  - Mechanics of Materials II (Mech 360)
  - Machine Dynamics (Manu 265)
  - Mechanical Engineering Labs, and Data Analysis (Mech 305)
  - Mechanical Engineering Labs, Mechatronic group, and Data Analysis (Mech 306)
  - Manufacturing Processes (Mech 392)
  - AI and Machine Learning in Manufacturing (Manu 465)
  - Proposed Course, Design for Additive Manufacturing (under development)
  - Mechanical Vibrations (Mech 463)
  - Capstone Design Project (Mech 45X)
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## Industrial Experience

**2014-2019:** Mechanical Engineer and Researcher at FPIInnovations\*, Department of Smart Manufacturing, Vancouver, BC, Canada

### Major Projects:

- Digital Signal Processing of Data collected by an Acoustic Emission Sensor, Microphone, and Non-contact displacement sensors for a guided splined saw machine
- Application of Machine Learning Algorithm in developing a smart saw-box
- Small energy harvesting inside a saw-box
- Development of an online saw performance monitoring system
- New guide pad design for circular saw
- Implementation of high-speed sawing, the effect of material property and stress
- Nano-coating for wood machining tools

- Provide primary guidelines for Canadian sawmills in designing saw blade, and choosing stable operational speeds
- Passive flow regulator for the saw lubrication systems
- Development of Temperature sensor for circular saw (Patent Application has been submitted)

(\* **FPIinnovations** is a world-leading provider of technology development, application and knowledge transfer services to the wood products industry.)

**2005-2009:** Mechanical Engineer at R&D Center of SAIPA (Iran's largest automotive corporation), Tehran

**Major Projects:**

- CAD modeling and structural analyses of various parts for a front suspension system for a passenger car
- Stress Analysis of Engine Mount Brackets
- Vehicle Dynamics (Ride and Handling) Optimization employing ADAMS Models
- Engine Mount Design

## Industrial Workshop

**Industrial workshops in Canada:**

**2017 Ahmad Mohammadpanah**, Kamloops, British Columbia, A workshop for Head Filers from two large Canadian Companies (West Fraser Wood Products, Canfor), Head Filers Convention in April 2017, Subject: "Optimum design for the lubrication of guided circular saws"

**2016 Ahmad Mohammadpanah**, FPIinnovations Webinar for Canadian Sawmill Industries, 2016, "Temperature Tolerance of Circular Saws"

**2016 Ahmad Mohammadpanah**, FPIinnovations Webinar for Canadian Sawmill Industries, and machine and Saw Manufacturer, 2016, "A Monitoring System for Circular Saw"

**2015 Ahmad Mohammadpanah**, Kamloops, British Columbia, A workshop for Head Filers from three large Canadian Companies (West Fraser Wood Products, Canfor, Tolko), Head Filers Convention in May 2015, Subject: "Measurement of Circular Saw Temperature and the Adverse effect on Saw Machine Performance"

**2014 Ahmad Mohammadpanah**, FPIinnovations, Webinar for Canadian Sawmill Industries, and machine and Saw Manufacturer, "Guideline for choosing an optimum speed of circular saws, considering the Flutter speed of saw"

## Students Evaluation of Teaching

My classes are known for being the experiential learning activities, in which my students improve their problem-solving and learning strategies, regardless of their baseline. My use of continuous assessment strategies, such as pre- and post-tests, allows me to give my students regular feedback on their learning progress and redesign my lesson plans as needed. I use guided questioning to answer student questions instead of directly answering. This approach is more challenging and my students learn more and deeper through actively engaging with the topic. My focus on student-centered teaching is highlighted in my evaluations and students in my MECH 305 (Design of Experimental Tests and Measurements) agreed/strongly agreed to the statement "Provide Guidance" (4.80 out of 5) and in my MECH 260 "An Effective Instructor" (4.85 out of 5), in all the design courses I have taught during the last two years at UBC To enhance motivation and relevance, I relate course material to the respective professional discipline. For example, in Design courses, such as design of mechanism (MANU 265) or Design for Manufacturing (MECH 392) I often connected class material to my own work and projects as a researcher and Engineer. Students benefitted from this connection, 97% agreed to the statement "Using the instructor's industrial Experiences at UBC made the content more relevant to me". (SEoT evaluations are attached for your reference). Here is a summary of student evaluations of teaching effectiveness average scores over the past few years (2018-2021):

Evaluation Questions	Scores			
	Mech 260	Mech 392	Mech 305/6	Manu 265
The instructor made it clear what students were expected to learn. (Score out of 5)	4.79	4.05	4.45	5
The instructor communicated the subject matter effectively. (Score out of 5)	4.84	4	4.42	5
The instructor helped inspire interest in learning the subject matter. (Score out of 5)	4.74	4.28	4.48	5
Overall, evaluation of student learning (through exams, essays, presentations, etc.) was fair. (Score out of 5)	4.88	4.13	4.37	4.85
The instructor showed concern for student learning. (Score out of 5)	4.79	4.44	4.55	5
Overall, the instructor was an effective teacher. (Score out of 5)	4.79	4.20	4.45	5
The instructor made it clear what students were expected to learn.	100%	78%	100.00%	5
The instructor communicated the subject matter effectively.	100%	83%	90.91%	100
The instructor helped inspire interest in learning the subject matter.	100%	80%	96.97%	100
Overall, evaluation of student learning (through exams, essays, presentations, etc.) was fair.	100%	85%	100.00%	100
The instructor showed concern for student learning.	100%	90%	96.97%	100

Overall, the instructor was an effective teacher.	100%	85%	96.97%	100
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As mentioned in my teaching philosophy, “Nurturing” (Good teachers care about their students and provides encouragement and support for each individual student, along with clear expectations and reasonable goals for all learners but do not sacrifice self-esteem for achievement) is one of my teaching perspectives. As an example, repeating the word, “caring” 89 times in one course students’ evaluation is a good illustration of this. Here is a screenshot of students’ feedback in one of my courses, with the word, “care” being highlighted.

**Comments**

The professor did a very good job of relating the material to industry and he went to great effort to do this (showing us simulations and arranging for success. Additionally, the professor always gave us examples and arranged guest lectures which were less helpful, but okay. We solved some examples, which were sometimes hard to follow. Also, we were given a ton of study material for both midterms and the exam which I am very thankful for. Overall, the class was very successful thanks to the professor

The instructor **cares** a lot about students and puts a lot of effort into teaching.

Great pamphlet, great questions, great teaching, midterms assessing what we learnt.

This course is taught extremely well, the professor does an amazing job of explaining difficult concepts. He also **cares a lot** about the students and is very helpful during office hours. I feel that I rarely have to ask for help because the professor does such an amazing job of explaining the material. The material can be dry at times but the professor will occasionally show us applications of the material we are learning in different fields.

Our professor, Ahmad Mohammadpanah Foroutaghe, is the best professor I've ever had. He did an amazing job at pacing the course that struggling students could keep up, while still keeping it interesting and applicable for stronger students. His emails even his emails made it very clear that he **cares** about his students. I will be taking MECH 260 next semester.

Ahmad is an excellent professor. He also **cares** about students' learning. Suggestion: please actually ask students to quiet down when it is time to take notes.

Dr. Mohammadpanah was one of the best instructors I have ever had. He also spends time out of classroom to make sure students are organized notes and catch up if I missed a class. I have used his office hours to help us prepare. On top of it all, he was charismatic and recognition he deserves.

Ahmad is an excellent professor. He also **cares** about student learning. Suggestion: please actually ask students to quiet down when it is time to take notes.

Dr. Mohammadpanah was one of the best instructors I have ever had. He also spends time out of class to help us better understand the material.

Dr. Mohammadpanah has taught us and I don't think anything needs to be changed. He really encouraged students to ask questions and lectures had a great mix of examples and applications.

Ahmed is amazing

Only location that needs improvement is the initial few webworks and their bugs. Overall absolutely loved the way Ahmad handled the course, he **cares** about students and makes sure to bring the wealth of knowledge he acquired in industry to the classroom. Please consider teaching some of the higher level eng phys courses as we would be delighted to have you as our instructor again!

MECH 260 was by far my favorite course and that is mainly thanks to Dr. Mohammadpanah, from day one he demonstrated his knowledge of the course material, his relevant, helpful (and nowadays rare among profs) work/ industry experience, his **caring** of his students learning; and ability to teach the material simply, concisely and with a right pace and balance of teaching novel material and solving examples. He always came up with examples from real world that would not only help us understand what the material is used for but also stimulate our interest in the course material and value the material because it is applicable to real world. I was able to see from my experience in UBC Rocket this year that the course material is not just theoretical but it is practical. I was able to apply what I learned into real world after class to apply what I learned into real world. Connections were made between what students were expected to know and the real life applications of this knowledge. A good variety of problems were solved in class to help us better understand, and the practice problems provided were challenging enough to help students learn.

All the information we needed was laid out extremely clearly, and connections were made between what students were expected to know and the real life applications of this knowledge. A good variety of problems were solved in class to help us better understand, and the practice problems provided were challenging enough to help students learn.

Professor Mohammadpanah always made expectations clear, and clearly **cares** about student learning. He was always available to help us better understand the material. His classes were always organized and effective.

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You are the best Prof I've had who actually **cares** a lot about the students learning.

First day of class and WE WERE ALREADY GIVEN A WHOLE BOOKLET PREPARED BY YOU, WITH ALL CONTENTS CLEARLY LAYED OUT?! THIS IS ALREADY WAY OVER EXPECTATION!!

You understand the students' struggles when we are hit by webworks and midterms from other courses. You were willing to extend your webwork.

You came to class with props to ensure student's understanding of the material taught, I really appreciate your effort.

You never ignored a raised hand in class even when you knew time was running out and the materials might not be covered in the class.

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## Educational Leadership Activities

### (a) Accomplishments in educational leadership (2020 – current)

- Submitted a paper to CICE-2021 (Canada International Conference on Education).
- Title:

*“The Learning effect of Speed vs Normal Watching Video Lectures, Engineering Education”*

- Developed the Machine Dynamics Lab (It has been used this year for MANU 265)
- Added the Machine Learning, Deep Learning (Artificial Neural Network, and Convolutional Neural Network), as a large portion of MECH 305/306 course. (It received a very positive feedback from students)
- Added a new Lab/Experiment, entitled “Sharp-Dull Hacksaw, and Sound”, to the current labs in MECH 305/306. (It piqued students’ interest, they enjoyed this lab, It received a very positive feedback from students).
- Lab-in-Box (as part of the MECH 305/6 for this year- pandemic). Several tests were designed with a focus on Data Analysis applications.

### (b) Curriculum development/renewal

- I proposed a new elective course which was accepted. The course will be taught in Sep 2021:
- MANU 465 (Intelligent Manufacturing) – topics: Applications of AI and ML in Manufacturing

### (c) Pedagogical innovation

- Lab-in-box experiments

The lab-in-box kit contains several Solid & Fluid Mechanics experiments. The review on this new method of running labs was very positive and we may continue to run the lab-in-box even post pandemic.

- Applications of and contributions to the scholarship of teaching and learning Research on the effect of “View Speeds”, when students watch recorded lectures. The abstract was submitted:

*“The Learning effect of Speed vs Normal Watching Video Lectures, Engineering Education”*

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## Capstone Design Projects

Here is the list of projects I have supervised at UBC, as part of the Capstone Design Course (2019 - current):

- Electronic continuously variable transmission (for BAJA SAE)
  - Human Centrifuge (for School of Kinesiology)
  - Rotary actuator on RISER (for School of Kinesiology)
  - CHHM Upright actuated platform for MRI (for Vancouver Hospital)
  - CSA Directional antenna
  - Human Balance Testing Device (for School of Kinesiology)
  - Reaction Rocket Nose Cone Design
  - MEMS Multi-Nozzle 3D Printer
  - Educational Spherical Parallel Manipulator (external link)
  - Hardhat of Future (external link)
  - Building a generic complex dynamic model for neck injuries, useful for Biomedical researchers (external links)
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## Service to the University

- Member of “Grade Policy” committee (2021)
  - Member of Cyber E Force (help with switching to Online teaching – year of pandemic), 2020
  - Department received a Metal 3D printer (from Rapidia). It took several months and a lot of works and collaboration with Rapidia engineers and technicians to run this machine. The Metal 3D printer can be used for educational purpose (in courses, such as MECH 392, Capstone Experiments in Mech 305/6, or for Capstone Design 45X), as well as research. (2020 - current)
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## Service to Other Universities

**2020** - Guest Speaker in BCIT (British Columbia Institute of Technology) – Wood machining Tools and Manufacturing Program, Topic: “Wood Intelligent Manufacturing”

**2021** - Guest Speaker in BCIT (British Columbia Institute of Technology) – Wood machining Tools and Manufacturing Program, Topic: “Wood Intelligent Manufacturing”

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## Publications

- Ahmad Mohammadpanah and Hutton S.G., 2019, “Limitation on Increasing the Critical Speed of a Spinning Disk Using Transverse Rigid Constraints, An application of Rayleigh’s Interlacing Eigenvalues Theorem”, ASME, Journal of Vibration and Acoustics, Paper No: VIB-17-1322.
  - Vahid Nasir, Ahmad Mohammadpanah & Julie Cool, 2018, “The effect of rotation speed on the power consumption and cutting accuracy of guided circular saw: Experimental measurement and analysis of saw critical and flutter speeds”, Wood Material Science & Engineering, doi:10.1080/17480272.2018.1508167.
  - Ahmad Mohammadpanah and Hutton S.G., 2017, “Theoretical and Experimental Verification of Dynamic Behavior of a Guided Spline Arbor Circular Saw,” Journal of Shock and Vibration, vol. 2017, Article ID 6213791
  - Ahmad Mohammadpanah, Bruce Lehmann, John White, 2017, “Development of a monitoring system for guided circular saws: an experimental investigation”, Wood Material Science & Engineering, DOI: 10.1080/17480272.2017.1415970
  - Ahmad Mohammadpanah, and Hutton S.G., 2016, “Vibrations and Dynamics Behaviour of a Guided Spline Spinning Disk, Subjected to Conservative In-Plane Edge Loads, Analytical, and Experimental Investigation”, ASME, Journal of Vibration and Acoustics, doi: 10.1115/1.4033456
  - Ahmad Mohammadpanah and Stanley G. Hutton, 2015, “Flutter Instability Speeds of Guided Splined Disks: An Experimental and Analytical Investigation,” Shock and Vibration, vol. 2015, 8 pages, 2015. doi:10.1155/2015/942141
  - Ahmad Mohammadpanah & Stanley G. Hutton, 2015, “Maximum operation speed of splined saws”, Wood Material Science & Engineering, doi:10.1080/17480272.2015.1108998.
  - Khorasany R.M.H., Ahmad Mohammadpanah, and Hutton S.G., 2012, “Vibration Characteristics of Guided Circular Saws: Experimental and Numerical Analyses”, ASME, Journal of Vibration and Acoustics, 134(6), doi:10.1115/1.4006650
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