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Engineering and Technology for the Better Good of Society, PIT-OER

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ENGINEERING AND TECHNOLOGY FOR THE BETTER GOOD OF SOCIETY

Material Prepared by Prof. Dimitrios Stroumbakis, Dr. Raymond Lam, and Prof. Huixin Wu

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DESCRIPTION

Engineering and Technology for the Better Good of Society PIT-OER is intended to train engineering technology students to leverage the power of select technologies aligned to the public interest applications and targeted public works institutions.

This PIT-OER consists of four modules:

- Module 1: Project Management Methods with Applications to Public Works.
- Module 2: Technology and Ethics: "Are You Conflicted?".
- Module 3: 3D Printing Applied to Everyday Public Interest and to Public Work Institutions.
- Module 4: How "Open" is Open Source Content: The Do's and Don't of Using Open Source Software, OSS.

Each module is organized with lecture, assessment, and laboratory experiments. The modules are course materials for TECH-100, Introduction to Engineering and Technology, of Queensborough Community College.

CLICK HERE TO GO TO THE COMPLETE COURSE

OUR MISSION

Understanding the importance of New America's commitment to strengthening the outcomes of non-profits and the public sector. We at QCC's Engineering Technology (ET) Department are dedicated to contributing to the nationwide efforts underway by Universities to establish Public-Interest-in-Technology curriculums. Technology impacts our every day lives like never before and it is time to augment the technologists' and engineers' education with curriculum components to enhance their ability to serve the good of society by:

- Teaching students to leverage 3D printing, Open Source Coding, Project Management and Engineering Ethics for the good of society.
- Exposing ET students to put into practice the design tenant of "public good" as a top priority along with their design priorities.
- Understanding the benefits of working in a public sector with meaningful class exercises.
- Creating measured outcomes of assessment, exercises, laboratories, and field visits.
- Using practical rules and processors of engaging and collaborating with local community and municipalities, relevant to the technology course topics.

MODULE 1: PROJECT MANAGEMENT METHODS WITH APPLICATIONS TO PUBLIC WORKS

This module will focus on introducing the student to Project Management using MS Project Tools, with an emphasis on applications applied to Public Sector, specifically to construction and building entities in NYC.

At the end of module 1, you will have created your own project execution plan, either in a team effort or on individual basis. Of course, the team effort allows for a special learning experience and we appraise active team participation.

Module duration: 9-hours

Module material prepared by: Prof. Stroumbakis

GO TO MODULE 1

MODULE 2: TECHNOLOGY AND ETHICS: "ARE YOU CONFLICTED?"

Module 2 give students an insight to key concepts of engineering ethics, sketch alternative views, and show examples of failures and successes in decision making processes. It also explains the Extra-Ordinary Case studies and every-day working ethics provided by the instructor experiences as a practicing engineer; explores Social / Pubic Good importance of technology and how intellectual challenge should be handled; discusses an engineer's life-long commitment to serve the disadvantaged, and an engineer's perseverance in understanding of societal problems and their feasible solutions; and exposes Engineer's Basic Code of Ethics.

Module duration: 7.5-hours

Module material prepared by: Prof. Stroumbakis

GO TO MODULE 2

MODULE 3: 3D PRINTING APPLIED TO EVERYDAY PUBLIC INTEREST AND TO PUBLIC WORK INSTITUTIONS.

This module presents various technologies of three dimensional (3D) printing, 3D printing materials, basic steps of 3D printing, and printing resolution. 3D printing capabilities at Queensborough Community College are described. 3D modeling software, including commercial software and free software, is introduced. Learners are trained on using Tinkercad free 3D modeling software for design and creation of three dimensional objects. Applications of 3D printing in general public use and public work use are described. Learners are required to complete two laboratories to design objects of public use. Learner's knowledge in 3D printing is assessed prior to and after taking the module.

Module duration: 9-hours
Module material prepared by: Dr. Lam
GO TO MODULE 3

MODULE 4: HOW "OPEN" IS OPEN SOURCE CONTENT: THE DO'S AND DON'T OF USING OPEN SOURCE SOFTWARE, OSS

Module 4 focuses on giving a brief explanation of what the practice of Open Source Software, OSS, is for public use. For this module, you will not need to download an OSS, instead it focuses on the student exploring what an OSS is, their ethics in personal and professional use, and also understanding the OSS communities that are available to the public use.

The module will do a pre-assessment exercise that will test your general knowledge of OSS before studying the material in this module and read and understand the Terms of Use of open applications. After the pre-assessment, we will read the material in this module, and take two laboratory exercises to assess your final understanding of the public use of OSS.

Module duration: 6-hours

Module material prepared by: Prof. Wu

GO TO MODULE 4

MEET OUR TEAM

Professor Dimitrios Stroumbakis, P.E., M.S.

Dimitrios Stroumbakis, holds a BSME / MSME from Polytechnic University (Summa Cum Laude), and Columbia University and is a licensed Professional Engineer in NY. Prior to transitioning to Academia, Dimitri acquired 24 yrs of experience in the undersea photonics industry contributing to the development of over 50 electro-optic devices for commercial and military markets. He served on two national industry standards groups and as core Team member, received two industry awards "Cisco's Optics Supplier of the Year" Award and "IBM's Quality Partner of the Year" Award. Dimitri is an Assistant Professor at Queensborough Community College (CUNY) and has a strong interests in Hybrid learning, leveraging instructional technology and industry partnering for student motivation.

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Doctor Raymond Lam, Sc.D.

Dr. Lam is an assistant professor at the department of Engineering Technology of Queensborough Community College. He earned his Doctor of Science in Materials Science and Engineering from Massachusetts Institute of Technology in 1998, Master of Science in 1983 and Bachelor of Science in 1981 both in Mechanical Engineering from University of Hawaii at Manoa. He has an extensive industrial experience of more than 25 years taking the roles of senior material scientist, development engineer, manufacturing engineer, manufacturing engineering manager, and quality engineer. He received 10 U.S. patents and published/presented 14 technical papers. Currently, Dr. Lam is working on research in three-dimensional printing.

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Professor Huixin Wu, M.S.

Professor Wu is a lecturer at the department of Engineering Technology of Queensborough Community College. She earned her Master of Science in Electrical Engineering from Stony Brook University, 2008. Prof. Wu is the course coordinator of the Digital Computer Theory course with the department of Engineering Technology at QCC. As the course coordinator, professor Wu updates the course outline and also creates homework and exercises to complement the learning materials for the course. She also has participated in grants and has experiences in creating new teaching terminologies for engineering technology students. She was the CO-PI of the National Science Foundation (NSF) STEM grant titled "A video Lecture Library and an Interactive Systems for Computer Programming Concepts". In addition from her teaching schedule, she is the lead of the curriculum development of TechWorks grant, and a faculty mentor of the students Undergraduate Research Project program at QCC. Professor Wu has more than ten years of experience teaching both the Digital Computer Theory course and laboratory in QCC and NYCCT.

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