

# THEHAZHAN (THIHAL) K. PONNAIYAN

2711 West Central Ave, Apt# F-9,  
Toledo, OH-43606

Ph: (419)-699-0803  
thehazh@yahoo.com

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## **OBJECTIVE**

Aiming to advance knowledge through excellence in learning, discovery and engagement, by working in a challenging and synergistic student-centered, community-engaged teaching environment.

## **EDUCATION**

<b>Ph.D. (Chemical Engineering)</b> The University of Toledo, Ohio, USA (CGPA: 4.00/4.00)	<b>Expected graduation: Spring 2016</b>
<b>M.S. (Advanced Chemical Engineering)</b> Imperial College, London, UK (Overall Performance: Distinction)	<b>Sept 2006</b>
<b>M.B.A. (Entrepreneurship &amp; Economic Forecasting)</b> Cardiff University, Cardiff, UK (Overall Performance: Distinction)	<b>Sept 2004</b>
<b>B.Tech. (Chemical Engineering)</b> Anna University, Chennai, India (Overall GPA: 9.3/10)	<b>May 2003</b>

## **TEACHING EXPERIENCE**

**Lecturer - Department of Chemical and Environmental Engineering, University of Toledo** **2015-**

### **Theory Courses:**

**Mass and Energy Balance (CHEE 2010)**  
**Professional Development (CHEE 1010)**

- Fundamentals of mass and energy balance for freshman class.
- Social protocol and ethics in industry.
- Development of resume writing, presentation and interview skills.
- Employed innovative teaching techniques for maximum classroom engagement.

### **Lab Courses:**

**Chemical Engineering Laboratory I (CHEE 4500)**  
**Chemical Engineering Laboratory II (CHEE 4550)**

- Practical application of theory in mathematics, science, and engineering in a lab setting.
- Maintenance of lab equipment and instruments.

**Video Coding for Project-Based Science (PBS) – Judith Herb College of Education, University of Toledo** **2012-13**

- Video documentation of science classroom teaching practices; Greenhills School, Ann Arbor, MI.
- Transcribed and coded 2 semesters of classes using NVivo 9 software, based on key attributes of PBS.
- Developed, formatted and edited supplemental online teaching resources for the companion website of the text book "*Teaching Science in Elementary and Middle School - A Project-Based Approach.*"

**Co-Instructor for Skills Building Workshop - Judith Herb College of Education, University of Toledo** **2012**

- Conducted faculty-mentored summer workshop for teacher leaders from public and private schools in the Toledo area.
- Provided training in analyzing PBS classroom teaching methods and developing lesson plans.

**Basic Educational Psychology: Science Leadership & Professional Development Design (EDP 7110)**

- Evaluated projects and class presentations.
- Maintained a record of attendance and grades.

**Project-Based Science CI 5890 (LEADERS\*) and CI 5980 (IMPACT#)**

- Setting up and maintaining the science lab as well as outdoor experiments for teacher leaders.
- Demonstrated science lab experiments and evaluated class projects.
- \*LEADERS - Leadership for Educators: Academy for Driving Economic Revitalization in Science (NSF grant)
- #IMPACT - Inquiry Masters Program for Teachers Advancing Content (U.S. Dept. of Education grant)

**Graduate Teaching Assistant – Dept. of Chemical Engineering, University of Toledo**

**2007-08**

**Chemical Engineering Thermodynamics I (CHEE 2230)**

**Process Dynamics and Control (CHEE 3400)**

**Chemical Process Economics and Design (CHEE 4520)**

**Chemical Engineering Laboratory II (CHEE 4550)**

- Weekly office hours to answer student questions.
- Customized tutoring/classroom sessions for students outside of office hours, upon request.
- Graded homework, tests and projects.
- Assisted in providing instructions on how to conduct different lab experiments.

**RESEARCH EXPERIENCE**

**Research Assistant – The University of Toledo, Ohio**

**2008-12**

*Critical Aspects in the Production of Ethanol from Ionic liquid pretreated biomass*

- Pretreatment of biomass with ionic liquids followed by enzymatic hydrolysis.
- Recovery and recycle of ionic liquids: thermodynamic aspects, and design of separation equipments.
- Characterization of lignocellulosic biomass substrates and lignin residues.

**Research Assistant – Imperial College, London, UK**

**2005-06**

*Effect of porosity & yield strength on the dissolution rate of tablets & granules*

- Formulation of food (flavor cubes) & pharmaceutical products (fever suppressers)
- Characterization of prepared samples (porosity & yield strength), and assessment of dissolution rates.

**Research Assistant – Cardiff University, Cardiff, UK**

**2003-04**

*Importance of personnel management for Total Quality Management (TQM) in manufacturing units*

- Case studies in chemical and automobile manufacturing units
- Extensive surveys (opinion poll, questionnaires, and personal interviews)
- Assessment of organizational structure & its impact on work efficiency & group dynamics.

**WORK EXPERIENCE**

**Marketing Manager – Amougaa Tradelink Inc., Dubai, U.A.E.**

**2004–05**

- Consumer products, metal scrap and iron ore trading.
- International customer liaison officer.

**Process Engineer & Signatory Director- EFFAA Healthy Life Pvt. Ltd., Chennai, India**

**2003-**

- Floor supervisor, modified-starch manufacturing division.
- Partial computerization of process flow & troubleshooting operations.

## **TECHNICAL SKILLS**

- Chromatographic Techniques: Fourier Transform Infrared Spectroscopy (FTIR), Gas Chromatography (GC), High Performance Liquid Chromatography (HPLC), Solid Phase Micro-Extraction (SPME) with GC, Gel Permeation Chromatography (GPC).
- Spectroscopic Techniques: Mass Spectroscopy (MS), Nuclear Magnetic Resonance (NMR), Ultra Violet (UV) Spectroscopy.
- Thermo Analytical Techniques: Thermogravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC).
- Others: X-Ray Diffraction (XRD), Karl Fisher Titration.

## **PUBLICATIONS & PRESENTATIONS**

- Thehazhnan Ponnaiyan and Sasidhar Varanasi, "Isolation and characterization of High Quality Lignin from IL Pretreated Biomass Using New Generation Enzymes" 33<sup>rd</sup> Symposium on Biotechnology for Fuels and Chemicals, SIM, May 2-5, 2011, Seattle, WA.
- Thehazhnan Ponnaiyan and Sasidhar Varanasi, "Integrated biorefineries: Isolation of Lignin from IL Pretreated Biomass for the Production of Value Added Lignin By-Products" AIChE Conference, Nov 7-12, 2010, Salt Lake City, UT.
- Thehazhnan Ponnaiyan, Constance Schall and Sasidhar Varanasi, "Evaporative Separation of Ionic Liquid following Biomass pretreatment: Generation of Required Thermodynamic Data" AIChE Conference, Nov 8-13, 2009, Nashville, TN.
- Fei Zhao, Thehazhnan Ponnaiyan, Constance Schall, Sasidhar Varanasi and JaredAnderson, "*Determination of Ethanol in Ionic Liquids Using Headspace Solid- Phase Microextraction-Gas Chromatography*" Analytical & Bioanalytical Chemistry, Vol. 392 (7-8), Dec 2008, pp.1271-1275.
- Dharmendira M, Ponnaiyan T and Rajendran M, "Free radical polymerization of methyl methacrylate in the presence of phase Transfer Catalyst" *International Journal of Polymeric Materials*, Vol.53 (1), Jan 2004, pp.95-103.

## **HONORS**

- International Student of the Year Award, University of Toledo (2010-11)
- 1st rank, Department of Chemical & Environmental Engineering, University of Toledo, (2007-).
- Outstanding Teaching Assistant (TA) Award, University of Toledo (2007-08).
- Shell Centenary Chevening Scholarship Recipient, Imperial College (2005).
- Won several awards in research conferences. Notable awards include:
  - UT Midwest Graduate Research Symposium – 1<sup>st</sup> Place (2011).
  - Cleveland State Interdisciplinary Research Conference (CSIRC)– 1<sup>st</sup> Place (2010).
- Won several interschool and state-level awards in painting, sketching, and essay writing (English and French).

## **LEADERSHIP ACTIVITIES**

- Faculty Advisor, Asha for Education, Toledo Chapter, (2015-)
- Co-founder, Ohio Board of Engineering Graduate Students, (2011-)
- President, Graduate Student Association, (University of Toledo, 2009-10).

## **COMPUTER SKILLS**

Design Expert, Minitab, SPSS, Unix, NVivo, Atlas.

## **LANGUAGES**

English, French, Tamil, Malayalam

## **COMMUNITY SERVICE**

Consistent blood donor: donated 33 units of blood till date.