	PURDUE UI	NIVERSITY		Print Form		
Office of the Registrar	REQUEST FOR ADDITION	ON, EXPIRATION,				
FORM 40G REV. 4/10	OR REVISION OF A GRA	DUATE COURSE				
	(50000-60000	Gradua	te Council Doc.	No. 10-24b		
RTMENT School of Engineering Education	EEEE	TIVE SESSION FAIL	010 SP 2011			
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INSTRUCTIONS: Please check the items below	which describe the purpose of this requ	est.				
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2. Add existing course offered at a		☐ 8.	Change in instructional h			
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6. Change in course credit/type		12.	Transfer from one depar			
PROPOSED:	EXISTING:		<del></del>	·		
	<u>EXISTING.</u>			RMS OFFERED ck All That Apply:		
Subject Abbreviation ENE	Subject Abbreviation		Summer	X Fall Spring		
Course Number 55300	Course Number		<u> </u>	US(ES) INVOLVED		
Long Title Introduction to Globalization and E	ngineering		Calumet	N. Central		
Short Title Intro to Global and Engr			Cont Ed	Tech Statewide		
	d by the Office of the Desister if a vivi		Indianapolis	XW. Lafayette		
	d by the Office of the Registrar if omitted	. (30 CHARACTERS ONLY)				
CREDIT TYPE  1.Fixed Credit: Cr. Hrs. 1		OURSE ATTRIBUTES	6: Check All That Apply			
2. Variable Credit Range:	1. Pass/Not Pass Only	6. F	Registration Approval Type			
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COURSE DESCRIPTION (INCLUDE REQUISITE	· · · · · · · · · · · · · · · · · · ·					
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role of multinational and metanational corporatio	ns, role of intellectual property and the glo	obal spread of technologic	ogy, global outsourcing and o	off-shoring of engineering jobs		
and services, global convergence of engineering	education and life-long learning. The co	urse includes lectures	by the instructor and by que:	st speakers representing		
industry and academia from all over the world. F This course is designed assuming a maturity leve	rere <b>g</b> s: (1) There are no specific courses el congruent with students having work e	s required as prerequis xperience or planning t	ites (2) Students must have : o enter fulltime employment	graduate or senior status. within a year.		
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<i>&amp;/L</i> /	tur		Professor Ha	rris.		
Calumet Department Head Date	Calumet School Dean	Date	Calumet Undergrad Curricul	um Committee Date		
Fort Wayne Department Head Date	Fort Wayne School Dean		Fort Wayne Chancellor			
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Indianapolis Department Head Date	Indianapolis School Dean	D-1-	Windergrad Curriculum Com	1 7-1-2010		
Date	,	Date		Date 20/31		
North Central Eaculty Senate Chair Date	Vice Chancellor for Academic Affairs	Date	Date Approved by Graduate	<del>-//</del>		
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Lafayette Department Head Date	West Lafayette College/School Dean	Date	Graduate Council Sectetar	Date		
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Office of the Registrar FORM 40G REV. 4/10

### **PURDUE UNIVERSITY**

REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF A GRADUATE COURSE

EFO 24-09 (50000-60000 LEVEL) DEPARTMENT School of Engineering Education

- Carlos of Engineering Educa		FFECTIVE SESSION Fa	1/2010 SP &OI/	
NSTRUCTIONS: Please check the items b	pelow which describe the purpose of this	request		
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2. Add existing course offered	at another campus		Change in course attr	ibutes
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PROPOSED:	EXISTING:		Transfer from one dep	partment to another
Subject Abbreviation ENE				ERMS OFFERED
	Subject Abbreviation		I	heck All That Apply:
Course Number 55300	Course Number		Summer	Fall Spring
Long Title Introduction to Globalization an	d Engineering		Calumet	MPUS(ES) INVOLVED  N. Central
Short Title Intro to Global and Engr		· · · · · · · · · · · · · · · · · · ·	Cont Ed	Tech Statewide
Abbreviated title will be ent	ered by the Office of the Desister is		Ft. Wayne Indianapol	XW Lafavette
CREDIT TYPE	ered by the Office of the Registrar if omi	tted. (30 CHARACTERS ONLY)		
1.Fixed Credit: Cr. Hrs. 1	1	COURSE ATTRIBUTE	S: Check All That Apply	
2.Variable Credit Range:	1. Pass/Not Pass Only	· []		
Minimum Cr. Hrs (Check One) To Or	2. Satisfactory/Unsatisfactory Only	· ·	Registration Approval Type Department	tanto ( TT
	3. Repeatable		Variable Title	Instructor
Maximum Cr. Hrs.	Maximum Repeatable Credit:		Honors	· <u>L</u>
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OURSE DESCRIPTION (INCLUDE REQUISITE History and dynamics of plobalization, and its important programmes of plobalization, and its important programmes and its important programmes and its important programmes.	ES/RESTRICTIONS):			.)
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Date	Yiayilo oolool Dean	Date	Fort Wayne Chancellor	Date
lianapolis Department Head Date	Indianapolis School Dean		V. K. Cipia	9-7-2010
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rth Central Faculty Senate Chair Date	Vice Chancellor for Academic Affairs	Date		
SR 2011 8/9/10	Y Mulay V. H.	4/m/m	Date Approved by Graduate (	Council
st Lafayette Department Flead Date	West Lafayette College School Dean	Date	Graduate Council Secretary	Date
uate Area Committee Convener Date	Graduate Dean	Date	West Lafayette Registrar	Jale

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Page 1 of 1

To:

The Faculty of the College of Engineering

From: Subject:

School of Engineering Education New Graduate Course, ENE 55300

The faculty of the School of Engineering Education has approved the following new graduate ENE course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENE 55300 Introduction to Globalization and Engineering Sem. 1, Lec. 1, Cr. 1.

### Prerequisite:

Graduate or upper division undergraduate standing. Students who successfully complete ENE55400 Globalization and Engineering cannot subsequently enroll in ENE 55300.

### Course description:

History and dynamics of globalization, and its impact on engineering practice and the lives and education of engineers. Topics include: global migration of highly-skilled people, free flow of capital and the globalization of R&D investment, world trade of commodities and high-tech products, global value chains and the process of innovation, role of multinational and metanational corporations, role of intellectual property and the global spread of technology, global outsourcing and off-shoring of engineering jobs and services, global convergence of engineering education and life-long learning. The course includes lectures by the instructor and by guest speakers representing industry and academia from all over the world.

#### Reasons:

Globalization is the most, or one of the most, influential forces of the first half of the 21st century. All students, regardless of discipline, benefit from an understanding of this force and its impact on their lives and professions. Engineers, in particular, will increasingly function in a globalized work environment. To lead and excel, engineers must understand globalization and incorporate that knowledge in their educational and career choices, as well as within their daily professional activities. This course provides an introductory framework on which students can expand their global competence. This course is designed for students planning a career in engineering or engineering education.

This credit course was previously offered as ENE 695D – Globalization and Engineering in 2006 (9 registered students) and ENE 595D – Globalization and Engineering in Fall 2007 (17 registered students) and Fall 08 (27 registered students). Average evaluation of course = 4.2 and average evaluation of instructor = 4.2.

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Kamyar Haghighi, Head
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<b>Engineering Education</b>
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ECC	Minutes	120		
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Chairman ECC R. Cipra

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- 1. Level: Graduate
- 2. Course Instructors: Dale Harris
- 3. Course Outline

### Learning Outcomes:

- Increased global awareness
- Knowledge of the dynamics of globalization as an economic and social process
- Recognition of engineering and engineers as important social and economic actors
- Understanding the global as the horizon of interest to the engineering profession in the 21st century
- Increased understanding of the nature and roles of engineering education and lifelong learning within the globalization dynamic
- Knowledge of how globalization impacts the process of innovation
- Knowledge of the engineering tools, processes, and attributes required to lead and innovate within a rapidly globalizing profession

Textbook: The World is Flat by Thomas Friedman (Farrar, Strauss and Giroux, 2007)

Syllabus: This syllabus is modeled after the course as it was taught in Fall 2008. Because of the use of case studies and the participation of guest speakers, the course syllabus would be different in details each time it is taught.

#### Class 1 Introduction

Introduction to the course; Introduction to globalization

#### Class 2 19th Century Globalization

- Why important
- Causes and how studied by economists, sociologists, and political scientists
- Globalization dynamics economics, migration of people, flow of capital
- Impact on workers (industrial and farming)
- Impact on the engineering profession
- Political response leading to deglobalization and isolationism

#### Class 3 20th and 21st Century Globalization

Culture; Economics; Politics; Technology; Environment; Psychology; Migration of highly skilled labor including engineers

Class 4 Case Study: Globalization of the Indian Software Services Industry Class 5

# Global Value Chains and Attributes of Engineers

#### Class 6 Globalization and Engineering Practice

- **Multinational Corporations**
- Globalization of R&D Investment
- Intellectual Property

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<ul> <li>Outsourcing and off-shoring of engineering jobs and services</li> </ul>
Asia and the Flat World
Case Study: Entrepreneurship and Upgrading of R&D Services in India
Case Study: Rolls-Royce and the Global Gas Turbine Engine Industry
Managing Innovation in Global Engineering Environments
Exam on book, The World is Flat
Europe and the Flat World
Case Study: Politics of the Global Economy
Global Governance
<ul> <li>Sovereign Nation-States</li> </ul>
<ul> <li>Multinational Corporations</li> </ul>
<ul> <li>Non-governmental Organizations (NGOs)</li> </ul>
<ul> <li>Intergovernmental Organizations (IGOs)</li> </ul>
Case Study: John Deere Corporation in China
Globalization and Engineering Education

### **Guest Speakers:**

### Parasuram Balasubramanian

Founder and CEO, Theme Work Analytics

Previously, Vice President, Infosys Technologies

Previously, CEO, Hytec Software Engineers

### **Professor Terrence Casey**

Department of Political Science, Rose-Hulman Institute of Technology

### Jeffery Finn

General Manager for China Operations, John Deere Corporation

#### Dr. Renate Fruchter

Department of Civil Engineering, Stanford University

### Gopichand Katragadda

General Manager, GE India Technology Center

#### Allan Novik

Vice President, Rolls-Royce Corporation

### Professor Balaji Parthasarathy

International Institute of Information Technology, Bangalore, India

### **Professor Bjorn Pherson**

Department of Telematics, Royal Institute of Technology, Sweden

### Peter Tannenwald

Manager, Infosys Technologies

#### Grading:

Attendance 80%; Exam 20%

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# Supporting Document for a New Graduate Course

To:	Purdue Universit	University Graduate Council			For Reviewer's comments only (Select One)		
From:	Faculty Member: Department:	Dale Harris Engineering Education			Reviewer:		
Date:	Campus: West Lafayette						
Subject:	Proposal for New Required by the C Registrar's Form	Graduate Co	Course-Documentati uncil to Accompan	ion y	Comments:		
	Contact for inforquestions arise:	rmation if	Name: Phone Number:	Cinde 494-3	ey Hays (temporary) 3884		
			E-mail: Campus Address:	isenb ARMS	erg@purdue.edu 5 1321		
	Course Subject Abl	oreviation and	d Number: ENE 553	300			
	Course Title: Introd	luction to Glo	obalization and Engin	eering			

### A. Justification for the Course:

- Provide a complete and detailed explanation of the need for the course (e. g., in the
  preparation of students, in providing new knowledge/training in one or more topics, in
  meeting degree requirements, etc.), how the course contributes to existing fields of study
  and/or areas of specialization, and how the course relates to other graduate courses offered
  by the department, other departments, or interdisciplinary programs.
- Justify the level of the proposed graduate course (50000- or 60000-level) including statements on, but not limited to: (1) the target audience, including the anticipated number of undergraduate and graduate students who will enroll in the course; and (2) the rigor of the course.

# B. Learning Outcomes and Method of Evaluation or Assessment:

- Describe the course objectives and student learning outcomes that address the objectives (i.e., knowledge, communication, critical thinking, ethical research, etc.).
- Describe the methods of evaluation or assessment of student learning outcomes. (Include evidence for both direct and indirect methods.)
- Grading criteria (select from dropdown box); include a statement describing the criteria that
  will be used to assess students and how the final grade will be determined.

<u>Criteria</u>	Attendance and Class Participation

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•	Identify the method(s) of instruction (select from dropdown box) and describe how the
	methods promote the likely success of the desired student learning outcomes.

		<u></u>
Method of Instruction	Presentation	
the same of the sa	L	

### C. Prerequisite(s):

- · List prerequisite courses by subject abbreviation, number, and title.
- List other prerequisites and/or experiences/background required. If no prerequisites are indicated, provide an explanation for their absence.

### D. Course Instructor(s):

- Provide the name, rank, and department/program affiliation of the instructor(s).
- Is the instructor currently a member of the Graduate Faculty?  $\times$  Yes No (If the answer is no, indicate when it is expected that a request will be submitted.)

#### E. Course Outline:

Provide an outline of topics to be covered and indicate the relative amount of time or
emphasis devoted to each topic. If laboratory or field experiences are used to supplement a
lecture course, explain the value of the experience(s) to enhance the quality of the course and
student learning. For special topics courses, include a sample outline of a course that
would be offered under the proposed course.

### F. Reading List (including course text):

- A primary reading list or bibliography should be limited to material the students will be required to read in order to successfully complete the course. It should not be a compilation of general reference material.
- A secondary reading list or bibliography should include material students may use as background information.

### G. Library Resources

- Describe the library resources that are currently available or the resources needed to support this proposed course.
- H. Example of a Course Syllabus (While not a necessary component of this supporting document, an example of a course syllabus is available, for information, by clicking on the link below, which goes to the Graduate School's Policies and Procedures Manual for Administering Graduate Student Programs. See Appendix K.)

http://www.gradschool.purdue.edu/downloads/Graduate School Policies and Procedures Manual.pdf

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# **ENE 55300** Introduction to Globalization and Engineering (one credit)

### Course description:

History and dynamics of globalization, and its impact on engineering practice and the lives and education of engineers. Topics include: global migration of highly-skilled people, free flow of capital and the globalization of R&D investment, world trade of commodities and high-tech products, global value chains and the process of innovation, role of multinational and metanational corporations, role of intellectual property and the global spread of technology, global outsourcing and off-shoring of engineering jobs and services, global convergence of engineering education and life-long learning. The course includes lectures by the instructor and by guest speakers representing industry and academia from all over the world.

### A. Justification for the Course

- Globalization is the most, or one of the most, influential forces of the first half of the 21st century. All students, regardless of discipline, benefit from an understanding of this force and its impact on their lives and professions. Engineers, in particular, will increasingly function in a globalized work environment. To lead and excel, engineers must understand the dynamics of globalization and incorporate that knowledge in their educational and career choices, as well as within their daily professional activities. This course provides an introductory framework on which students can expand their global competence. This course is designed for students planning a career in engineering practice or engineering education.
- The course is organized as a seminar course making use of outside speakers from around the world. There is also required reading. The course targets graduate students in all engineering disciplines planning a career in engineering or engineering. The course is also suitable for undergraduate seniors. This credit course was previously offered as ENE 595 Globalization and Engineering in Fall 2007 (17 registered students), Fall 2008 (27 registered students) and Fall 2009 (34 registered students). Average evaluation of course = 4.2 and average evaluation of instructor = 4.2. Based on enrollments in the experimental versions of the course, approximately 40 enrollments per offering are expected.

# B. Learning Outcomes and Methods of Evaluation or Assessment

### Learning outcomes:

- Increased global awareness
- Knowledge of the dynamics of globalization as an economic and social process

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- Recognition of engineering and engineers as important social and economic actors
- Understanding the global as the horizon of interest to the engineering profession in the 21st century
- Increased understanding of the nature and roles of engineering education and life-long learning within the globalization dynamic
- Knowledge of how globalization impacts the process of innovation
- Knowledge of the engineering tools, processes, and attributes required to lead and innovate within a rapidly globalizing profession

### Methods of evaluation of learning outcomes:

Evaluation of learning outcomes is done by

- observation of student in-class engagement and discussions
- exam results
- student written work
- end of course survey

### Grading:

Grading is based on a combination of class attendance (this is primarily a seminar course), one exam covering the course textbook, and completion of formal notes taken on each seminar speaker.

### C. Prerequisites:

- There are no specific courses required as prerequisites
- Students must have graduate or senior status. This course is designed assuming a maturity level congruent with students having work experience or planning to enter fulltime employment within a year.

#### D. Course Instructor:

Dale Harris
Professor, Engineering Education
Currently a member of the Graduate Faculty

#### E. Course Outline:

The syllabus below describes the course topics and indicates the relative amount of time devoted to each. Guest speakers will vary year-to-year. Those listed below participated in the experimental offering of the course in Fall 2009.

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Assigned Book: The World is Flat, Thomas Friedman (any version).

Week 1 Introduction Introduction to the course Introduction to globalization Week 2 19th Century Globalization Why important Cause Dynamics - Economics, migration of people, flow of capital Impact on labor (industrial and farming) Impact on the engineering profession Political response leading to deglobalization and isolationism Week 3 Guest Speaker: Gopichand Katragadda General Manager, Engineering Operations GE Energy - India Bangalore, India Subject of talk: Global Innovation in the Flat World Week 4 20th and 21st Century Globalization **Global Governance** Sovereign Nation-States Intergovernmental Organizations (IGOs) Non-Governmental Organizations (NGOs) **Multinational Corporations** Guest Lecture by Hari Harikumar Vice President, Ingersoll Rand Engineering Center, Bangalore, India Week 5 20th and 21st Century Globalization Globalization of R&D Investment Importance and Impact **Drivers and Dynamics** Statistical Snapshot Guest Lecture by Professor Kaili Kan Previous Dean of the School of Business Management Beijing University of Posts and Telecommunications, China Week 6 20th and 21st Century Globalization Global Dispersion of Engineering Jobs and Migration of Highly Skilled Statistical Snapshot Importance and Impact **Guest Lecture by Professor Rabi Mohtar** Director of Global Engineering Programs, Purdue University Week 7 Guest Speaker: Bjorn Pehrson Professor and Previous Chair, Department of Teleinformation The Royal Institute of Technology Stockholm, Sweden Subject of talk: Globalization and Engineering Education - The Swedish Perspective Week 8 20th and 21st Century Globalization Impact of Globalization on Organizations and Multinational Corporations Scientization, Rationalization, and Standardization of Organization Management Innovation in the Flat World by Multinational Corporations Guest lecture by Professor Vedhathiri Thanikachalam National Institute of Technical Teachers Training and Research, Chennai, India Week 9 **Guest Speaker: Emily Ligget** CEO, NovaTorque Sunnyvale, California Subject of talk: Global Engineering Leadership in Companies Large and Small

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Week 10 Guest Speaker: Gene Spafford

**Professor of Computer Science** 

Executive Director, Center for Education and Research in Information Assurance and

Security

**Purdue University** 

Subject of talk: Globalization and Intellectual Property

Week 11

Guest Speaker: Shyamal Majumdar

**Director General and CEO** 

Columbo Plan Staff College for Technical Education

Manila, Philippines

Subject of talk: Engineering and Engineering Education in the Asia Pacific

Region

Week 12

Test on The World is Flat

Week 13

20th and 21st Century Globalization

Globalization of Technology, Innovation, and Intellectual Property Law

Technology Transfer and Technology Leak
Distributed Research, Development, and Design

Standardization of Intellectual Property Law and Trends in Enforcement

Guest lecture by Sergio Nacach

Vice President of Andean Region Operations, Kimberly-Clark, Lima,

Puru

Week 14

21st Century Globalization and Beyond

The Future of Globalization

Week 15

**Course Conclusion and Review** 

### F. Reading List (course text)

The World is Flat by Thomas Friedman; Published by Picador / Farrar, Straus and Giroux (New York, 2007)

### G. Library Resources

None required beyond the course text

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