



Asia-Pacific
Economic Cooperation

2006/HRDWG/SYM/017

Agenda Item: 16

Open Courseware: Experience from Chulalongkorn University's Collaboration with MIT

Purpose: Information
Submitted by: Thailand



**APEC Symposium on Open Source
and Open Course for E-Learning
Ha Noi, Viet Nam
4 - 6 December 2006**

Abstract

Manoj Lohatepanont

In this talk, the author presents the experience from a collaboration project between Chulalongkorn University, Thailand and Massachusetts Institute of Technology (MIT), USA on OpenCourseware. Chulalongkorn University recognizes the potential of OpenCourseware movement in enabling the societies to learn and the education institutes to share the knowledge through the Internet. With this vehicle, educators can share their knowledge freely and self-learners and even educators can learn and improve their knowledge at their own pace. Chulalongkorn University is currently hosting a MIT OpenCourseware mirror site and a MIT OpenCourseware Translation site, and is constructing its own OpenCourseware site offering subjects taught at Chulalongkorn University.

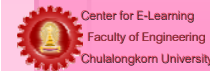


OpenCourseware: Experience from Chulalongkorn University's Collaboration with MIT

Dr. Manoj Lohatepanont
Associate Director, Center for E-Learning
Faculty of Engineering, Chulalongkorn University
December 2006

Outline

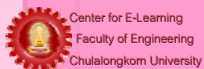
- MIT OpenCourseware
- OCW Consortium
- Collaboration with MIT
- Educational Liberalization



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Chulalongkorn University

MIT OpenCourseware (OCW)

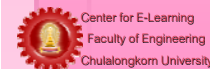
- MIT OCW is a large-scale, Web-based electronic publishing initiative.
- A free and open educational resource for educators, students, and self-learners around the world. OCW supports MIT's mission to advance knowledge and education, and serve the world in the 21st century.
- MIT OCW:
 - Is a publication of MIT course materials
 - Does not require any registration
 - Is not a degree-granting or certificate-granting activity
 - Does not provide access to MIT faculty



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MIT OCW

- MIT OCW's goals are to:
 - Provide free, searchable, access to MIT's course materials for educators, students, and self-learners around the world.
 - Extend the **reach and impact** of MIT OCW and the **"opencourseware" concept**.
- As of May 2006, there are 1,400 courses online at <http://ocw.mit.edu>.



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Reflections from MIT President Susan Hockfield

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Electrical Engineering and Computer Science

Electrical engineering, originally taught at MIT in the Physics Department, became an independent degree program in 1882. The Department of Electrical Engineering was formed in 1902, and occupied its new home, the Lowell Building, when MIT was still located near Copsey Square in Boston. The Department dedicated its present facilities in the Sherman Fairchild Electrical Engineering and Electronics complex in Fall 1973, and a year later, it recognized its growing activity in computer science by changing its name to Electrical Engineering and Computer Science. The Department's activities in computer science, communications, and control moved into the architecturally unique and exciting Ray and Maria Stata Center for Computer, Information, and Intelligence Sciences in Spring 2004.

The primary mission of the Department is the education of its students. Its three undergraduate programs attract more than 30 percent of all MIT undergraduates, and its doctoral programs are highly ranked and selective. A leader in cooperative education, the Department has operated the highly successful VISA Internship Program since 1917. It has recently established a five-year Master of Engineering program, under which students stay for a fifth year and receive simultaneously a Bachelor's degree and a Master's of Engineering degree.

During its history faculty and students of the Department have made major, lasting research contributions, some of which have opened up entire new fields of study. For more information, go to <http://www.eecs.mit.edu/>.

Available Courses


- Undergraduate
- Graduate
- Undergraduate/Graduate

Undergraduate Courses

MIT COURSE #	COURSE TITLE
6.001	Structure and Interpretation of Computer Programs, Spring 2005
6.002	Circuits and Electronics, Fall 2000
6.003	Signals and Systems, Fall 2003
6.004	Computation Structures, Fall 2002
6.011	Introduction to Communication, Control, and Signal Processing, Spring 2004 - Spring 2005
6.012	Microelectronic Devices and Circuits, Fall 2005 NEW
6.012	Microelectronic Devices and Circuits, Fall 2003
6.013	Electromagnetics and Applications, Fall 2002
6.013	Electromagnetics and Applications, Fall 2003 NEW
6.0211	Quantitative Physiology: Cells and Tissues, Fall 2004
6.0221	Quantitative Physiology: Organ Transport Systems, Spring 2004
6.0251	Introduction to Bioengineering (RE.010), Spring 2006 NEW
6.033	Computer System Engineering (SMA 5501), Spring 2005
6.034	Artificial Intelligence, Spring 2005
6.034	Artificial Intelligence, Fall 2002
6.035	Computer Language Engineering (SMA 5502), Fall 2005 NEW
6.0421	Mathematics for Computer Science, Fall 2004 NEW

» [View courses alphabetically](#)

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6.003 Signals and Systems, Fall 2003



The course number, 6.003, rendered as a reflection of themes in Signals and Systems. (Image courtesy of Prof. Alan Wilsky.)

Highlights of this Course

The course features a full set of [lectures notes](#). In addition, exams with solutions are available in the [exams](#) section.

» [View the course as a list of lectures notes.](#)

Course Description

The course covers fundamentals of signal and system analysis, with applications drawn from filtering, audio and image processing, communications, and automatic control. Topics include convolution, Fourier series and transforms, sampling and discrete-time processing of continuous-time signals, modulation, Laplace and Z transforms, and feedback systems.

Staff

Instructors:
Prof. Paul Gray
Dr. Charles Kubos
Prof. Alan Wilsky
Prof. Joel Voldman
Prof. Victor Zue

Course Meeting Times


Lectures:
Two sessions / week
1 hour / session

Recitations:
Two sessions / week
1 hour / session

Level
Undergraduate

Feedback
Send [feedback](#) about OCW or this course.

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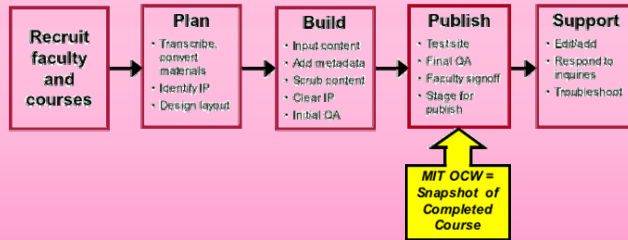
Lecture Notes

Available lecture notes are listed below.

SEM #	TOPICS
R1	CT and DT Signals
L1	Introduction (GG)
R2	CT and DT Signals (cont.)
L2	CT and DT Systems (GG)
R3	CT and DT Systems
L3	DT Convolution (GG)
R4	DT Convolution
L4	CT Convolution, Impulses (GG)
R5	CT Convolution, Impulses
L5	CT Fourier Series (GG)
R6	CT Fourier Series
L6	CT and DT Fourier Series (GG)
R7	CT and DT Fourier Series
L7	Frequency Response, Filtering I (GG)
R8	Fourier Series, Filtering
L8	CT Fourier Transform (GG)
R9	CT Fourier Transform
L9	CT and DT Fourier Transform (GG)
R10	CT and DT Fourier Transform
L10	DT Fourier Transform (GG)
R11	DT Fourier Transform
L11	High PT, Mag/Phase of Freq. Response (GG)
R12	PT and Review for Quiz
L13	PT and Bode Plots
L12	Effects of Phase, 1st and 2nd order DT Systems (GG)
R14	Bode Plots, 1st and 2nd order DT systems
L15	Sampling, Aliasing (GG)
R15	Sampling
L14	DT Processing of CT Signals I (GG)
R16	DT Processing of CT Signals
L17	Stimulated Modulation (GG)
R17	Amplitude Modulation

MIT Publication Process

- The publication lifecycle of the MIT faculty's content is the core process of MIT OpenCourseWare, which is best understood as a digital publishing organization.



Content Management System

- What is Content Management System (CMS)?



Utah State

ocw.usu.edu



Kyoto

ocw.kyoto-u.ac.jp



Vietnam

■ <http://voice.net.vn/>

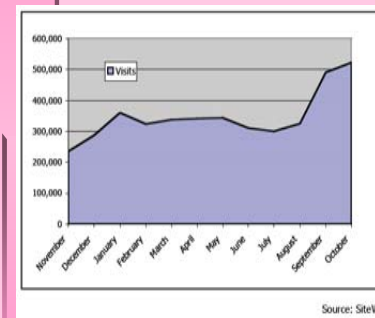
Impacts

- 95% of users report MIT OCW has or will help them to be more productive and effective
- 46% of educators have adopted MIT OCW content to improve their own teaching
- 38% of students use MIT OCW materials to complement a course they are taking; 34% use MIT OCW to learn about subjects outside of formal classes
- 56% of self-learners use MIT OCW to enhance personal knowledge; 16% use MIT OCW to stay current in their chosen field
- 96% of all users would recommend MIT OCW to others

MIT OCW Translation

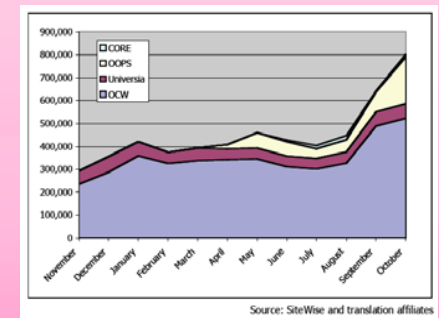
- MIT OpenCourseWare (MIT OCW) has originally partnered with organizations that are translating MIT OCW course materials into Spanish, Portuguese, Simplified Chinese, and Traditional Chinese.
- Since September 2002, when the MIT OCW pilot phase opened to the public, MIT OCW materials have been translated into at least 10 languages, including Spanish, Portuguese, Chinese, Thai, French, German, Vietnamese, and Ukrainian.

MIT OCW Stats



Number of Visitors

Source: SiteWise



Number of Visitors

Source: SiteWise and translation affiliates

MIT OCW Stats

Role	04 Survey	03 Survey
Educator	15.3%	13.1%
Student	31.4%	30.9%
Self learner	48.2%	51.6%
Other	5.1%	4.4%
Total	100.0%	100.0%

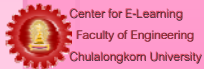
Source: SiteWise

User Identifications

Degree	%
High school	13.3%
Associates	6.6%
Bachelors	33.3%
Masters	32.2%
Doctorate	11.7%
Other	2.9%
Total	100.0%

Source: 2004 Intercept Survey

Education Background

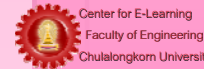


MIT OCW Stats

Subject Area	All Roles	Subject Area	All Roles
Electrical Engineering/Computer Science	26.6%	Architecture	1.1%
Business	6.8%	Foreign Languages & Literatures	1.1%
Management	6.8%	Philosophy	1.1%
Physics	5.9%	Political Science	1.0%
Mathematics	5.4%	Biological Engineering	1.0%
Other	5.2%	History	0.9%
Mechanical Engineering	5.1%	Linguistics	0.9%
Economics	4.4%	Media Arts and Sciences	0.9%
Aeronautics and Astronautics	3.2%	Writing and Humanistic Studies	0.9%
Biology	2.5%	Earth, Atmospheric, Planetary Sciences	0.8%
Civil and Environmental Engineering	2.5%	Literature	0.8%
Science, Technology and Society	2.3%	Ocean Engineering	0.5%
Engineering Systems	2.2%	Anthropology	0.4%
Health Sciences and Technology	1.9%	Comparative Media Studies	0.3%
Chemistry	1.7%	Nuclear Engineering	0.3%
Brain and Cognitive Sciences	1.7%	Music	0.3%
Material Science and Engineering	1.7%	Theater Arts	0.1%
Chemical Engineering	1.4%	Total	100.0%

Source: 2004 Intercept Survey

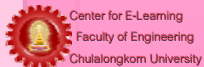
Number of Visits by Department



MIT OCW Stats

Rank	URL	Visits	Rank	URL	Visits	Rank	URL	Visits
1	mit.edu	65,253	19	utexas.edu	2,263	37	rutgers.edu	1,677
2	ntu.edu.tw	11,421	20	upenn.edu	2,236	38	ucla.edu	1,673
3	nus.edu.sg	11,007	21	umd.edu	2,180	39	u-tokyo.ac.jp	1,657
4	harvard.edu	5,889	22	cuhk.edu.hk	2,136	40	trnc.edu.tw	1,655
5	stanford.edu	3,356	23	nthu.edu.tw	2,123	41	northwestern.edu	1,636
6	nctu.edu.tw	3,168	24	cmu.edu	2,121	42	ox.ac.uk	1,611
7	gatech.edu	3,117	25	iitm.ac.in	2,113	43	ohio-state.edu	1,582
8	columbia.edu	3,013	26	csu.edu.au	2,081	44	metu.edu.tr	1,570
9	purdue.edu	3,008	27	umn.edu	2,057	45	asu.edu	1,558
10	umich.edu	2,855	28	ufl.edu	2,016	46	surrey.ac.uk	1,537
11	uiuc.edu	2,794	29	psu.edu	1,937	47	wisc.edu	1,527
12	cornell.edu	2,785	30	duke.edu	1,865	48	ecu.edu.au	1,512
13	cam.ac.uk	2,665	31	bg.ac.yu	1,818	49	itu.edu.tr	1,498
14	tamu.edu	2,661	32	yale.edu	1,765	50	unsw.edu.au	1,478
15	berkeley.edu	2,655	33	kaist.ac.kr	1,746	—	Others	244,046
16	usc.edu	2,431	34	technion.ac.il	1,727	Total for 3,154 ISPs		434,630
17	washington.edu	2,373	35	nyu.edu	1,722	Source: 2004 Intercept Survey		
18	bu.edu	2,339	36	uiowa.edu	1,717			

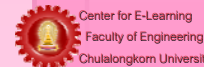
Origin of Visits from Educational Institutes



Stats

Rank	URL	Visits	Rank	URL	Visits	Rank	URL	Visits
1	comcast.net	87,614	36	rcn.com	9,641	71	biscali.it	5,097
2	aol.com	72,834	37	so-net.net.tw	9,248	72	eth.net	4,837
3	rr.com	66,696	38	localhost	8,984	73	tpnet.pl	4,737
4	attbi.com	46,706	39	newsbies.net	8,656	74	t-ipcconnect.de	4,661
5	pacbell.net	38,186	40	ntli.net	8,626	75	lmco.com	4,555
6	verizon.net	37,204	41	ttnet.net.tr	8,269	76	pacific.net.sg	4,555
7	cox.net	35,332	42	maxonline.com.sg	8,054	77	bigpond.net.au	4,542
8	hinet.net	29,311	43	blueyonder.co.uk	7,932	78	motorola.com	4,532
9	sify.net	27,360	44	bttec.net	7,812	79	avantgo.com	4,267
10	ne.jp	26,000	45	intel.com	7,779	80	optusnet.com.au	4,164
11	interbusiness.it	22,141	46	bezeqint.net	7,722	81	ernet.in	4,157
12	rma-tde.net	21,382	47	cantv.net	7,575	82	hp.com	4,153
13	rogers.com	21,345	48	boeing.com	7,454	83	primus-india.net	4,134
14	optonline.net	20,621	49	singnet.com.sg	7,443	84	insightbb.com	4,050
15	bellsouth.net	20,271	50	speedy.net.pe	7,304	85	exatt.net	4,020
16	sympatico.ca	20,190	51	tfn.net.tw	7,195	86	mchsi.com	3,951
17	vsnl.net.in	19,837	52	giga.net.tw	7,010	87	af.mil	3,857
18	seed.net.tw	19,451	53	prod-inifitum.com.mx	6,647	88	af.mil	3,857
19	t-dialin.net	19,260	54	luu.net	6,541	89	asianet.co.th	3,744
20	mindspring.com	18,001	55	prodigy.net.mx	6,416	90	iprimus.net	3,722
21	adelphia.net	17,209	56	btopenworld.com	6,385	91	army.mil	3,550
22	netvigator.com	16,073	57	veloxzone.com.br	6,348	92	otenet.gr	3,414
23	shawcable.net	15,487	58	proxad.net	6,219	93	earthlink.net	3,271
24	isvbell.net	15,465	59	skynet.be	6,207	94	info.com.ph	3,242
25	wanadoo.fr	14,672	60	touchtelindia.net	6,014	95	bluewin.ch	3,230
26	amertech.net	14,280	61	btcentralplus.com	5,993	96	speakeasy.net	3,147
27	level3.net	14,099	62	hkicable.com.hk	5,811	97	u-bourgogne.fr	3,145
28	qwest.net	12,625	63	libero.it	5,598	98	telepac.pt	3,135
29	telep.net.br	12,536	64	isu.net.sa	5,568	99	njpr.mil	3,122
30	navy.mil	11,546	65	pol.co.uk	5,564	100	telecom.net.ar	3,067
31	ebix.net.tw	11,431	66	ibm.com	5,524	Sub Total of top 100		1,227,842
32	charter.com	11,267	67	raytheon.com	5,303	Total for 37,604 ISPs		2,230,251
33	dsl-verizon.net	11,043	68	att.net	5,221	Total for Unknown		1,519,635
34	covad.net	10,362	69	brasiltelecom.net.br	5,207	Total		3,749,886
35	telus.net	9,725	70	videotron.ca	5,111	Source: SiteWise		

Origin of Other Visits

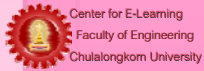


MIT OCW Stats

Scenario	% of use	Completely successful	Somewhat successful	Not successful	Total
Enhance personal knowledge	25.0%	34.0%	55.2%	10.8%	100.0%
Develop a course	22.8%	34.1%	56.2%	9.7%	100.0%
Prepare for a specific class	17.8%	43.8%	46.5%	9.7%	100.0%
Enhance research	13.8%	39.8%	54.9%	5.3%	100.0%
Develop curriculum	9.3%	36.5%	52.7%	10.8%	100.0%
Advise students	4.3%	54.3%	42.9%	2.9%	100.0%
Develop educational technology	3.6%	41.4%	48.3%	10.3%	100.0%
Other	3.4%	46.4%	42.9%	10.7%	100.0%
All scenarios	100.0%	38.3%	52.4%	9.2%	100.0%

Source: 2004 Intercept Survey

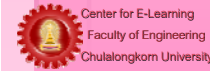
Reason of Visits



OCW Consortium

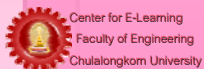
<http://www.ocwconsortium.org/>

- OCW Consortium is a collection of institutes of higher education who support the Open Courseware concept
- The consortium started from a small network of like-minded institutes who share similar ideals
- It has grown to a reasonable size of more than 30 world class universities and institutes
- The most recent consortium meeting was in Kyoto, Japan in summer 2006



Japan OCW Consortium

- Hokkaido
- Keio
- Kyoto
- Kyushu
- Nagoya
- Osaka
- Tokyo Tech
- Tokyo
- Waseda



Kyoto

ocw.kyoto-u.ac.jp

Japanese | English

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KYOTO UNIVERSITY

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一、人類の文運をため、地球の輝きに貢献する。
文運は武運の対極
現代科学のいづれもが文運にかかわる。

京都大学OpenCourseWareは、全人類のための「創造的グローバル＝ローカルな知のクラスター」という視点から国際的な知的資産の蓄積に貢献に参加すること、および京都大学のレジリエンスを高め、世界中から優秀な教員、学生を発見すること、およびインターネットによる国際的な教育展開を狙っています。

一、門外とやいなす言葉を書き、教育は共に楽しむを旨とする。
学の統合の鍵は言語にあり。
よき言語による教育は華なる知識伝達にとどまらず。

OCW@KUは、MITOCWへのアクセスの6割がアジア圏からであるという事実を考慮した情報発信をねらっています。アジア各国からの優秀な留学生をリクルートするとともに、世界に向けて、京都の文化と伝統を持つ京都大学の教育をアピールするために、積極的に日本語を使って、OCWを作成していきます。さらに、OCWを新しい教育メディアとしてアジア各国とのコミュニケーションを高い国際交流を推進してゆきます。

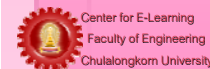
一、賢才が購ることなく、賢才もまた購るべき大学。

この京都大学OCWは、京都大学で講義に利用している教材をインターネットで公開するプロジェクトです。学内の学生、教職員、他大学の学生、関連学会の研究者、京都大学を志願する高校生、さらなる学習を志す社会人など、あらゆる方々に京都大学の講義内容を知っていただくことを目的として、広く社会に貢献するだけでなく、ウェブにおける知的資産の蓄積に貢献することを

アクセスできる授業リスト
講義一覧 (国語分類法)

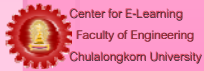
総合人間学部
文学部
教育学部
法学部
経済学部
理学部
医学部
工学部
農学部
全学共通科目

文学研究科
教育学研究科
法学研究科
経済学研究科
理学研究科
医学研究科



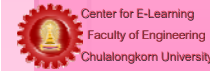
China

- Peking University
- Tsinghua University
- Zhejiang University
- Xi'an Jiaotong University
- Central South University
- Beijing Jiaotong University
- Sichuan University
- Beijing Normal University
- Dalian University of Technology
- Central Radio and Television University
- Shanghai Jiaotong University
- Nanjing University
- Jilin University
- Northwest Polytechnic University
- Southeast University
- Sun Yat-Sen University
- Fudan University
- Huazhong University of Science and Technology
- Renmin University of China
- Huazhong Agricultural University



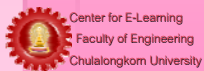
France

- The engineering institutions ("Grandes Ecoles") which form ParisTech have published the ParisTech OpenCourseware project. The ParisTech institutions include:
 - École Nationale du Génie Rural, des Eaux et des Forêts (ENGREF)
 - École Nationale des Ponts et Chaussées (ENPC)
 - École Nationale Supérieure d'Arts et Métiers (ENSAM)
 - École Nationale Supérieure de Chimie de Paris (ENSCP)
 - École Nationale Supérieure des Mines de Paris (ENSMP)
 - École Nationale Supérieure des Télécommunications (ENST)
 - École Nationale Supérieure de Techniques Avancées (ENSTA)
 - École Polytechnique (EP)
 - École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI)
 - Institut National Agronomique Paris-Grignon (INA P-G)
 - École Nationale de Statistique et d'Administration Économique (ENSAE) (associate member)



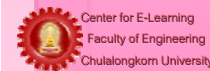
Vietnam

- Fulbright Economics Teaching Program
- Vietnam OpenCourseware
 - Can Tho University
 - Da Nang University
 - Hanoi Agriculture University No.1
 - Hanoi Education University
 - Hanoi Medical University
 - Hanoi National University of Economics
 - Hanoi University of Technology
- Vietnam OpenCourseware (Cont'd)
 - HCMC Education University
 - HCMC Medical University
 - HCMC University of Economics
 - Hue University
 - Thai Nguyen University
 - Vietnam National University – Hanoi
 - Vietnam National University – HCMC



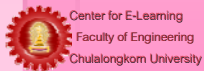
USA

- Defense Acquisition University
- Harvard Law School, Berkman Center for Internet and Society
- Johns Hopkins Bloomberg School of Public Health
- Massachusetts Institute of Technology
- Michigan State University
- Tufts University
- University of California, Irvine
- University of Michigan School of Information
- University of Notre Dame
- Utah State University
- Utah Valley State College
- Wheelock College



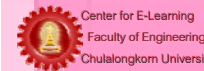
Others

- Austria
 - University of Klagenfurt
- Canada
 - Capilano College
- Saudi Arabia
 - Alfaisal University
- South Africa
 - University of the Western Cape
- Thailand
 - Chulalongkorn University
- United Kingdom
 - The Open University
- Venezuela
 - Universidad Central de Venezuela
 - Universidad de Los Andes



Collaboration between Chulalongkorn University and MIT

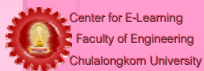
- Chulalongkorn University's Dean of Engineering visited MIT and started the collaboration in 2005
- Translation agreement signed in 2005
- Translation started shortly after with financial supports from the Office of Higher Education, Ministry of Education
- The first phase of the project is completed and published on the web at <http://mit-ocw-thai.eng.chula.ac.th>



Thai MIT OCW

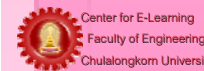
mit-ocw-thai.eng.chula.ac.th

The screenshot shows the Thai MIT OCW website. At the top, it says 'MITOPENCOURSEWARE MASSACHUSETTS INSTITUTE OF TECHNOLOGY CHULALONGKORN UNIVERSITY'. Below that, there is a section titled 'ยินดีต้อนรับสู่ โครงการพัฒนาระบบการเรียนการสอน (OpenCourseWare) ด้านวิศวกรรมศาสตร์' (Welcome to the Engineering OpenCourseWare Development Project). It features a photo of Susan Hockfield, MIT's president at the time, and a list of MIT OCW courses. The website is in Thai and provides information about the partnership between MIT and Chulalongkorn University.



Thai MIT OCW

The screenshot shows a specific course page on the Thai MIT OCW website. The course is 'MIT OpenCourseWare - วิศวกรรมไฟฟ้าและคอมพิวเตอร์' (MIT OpenCourseWare - Electrical Engineering and Computer Science). The page includes a description of the course, a list of lecturers (Susan Hockfield, MIT), and a list of course materials. There is also a photo of students working with a robot in a classroom. The website is in Thai and provides detailed information about the course content and access.



MITOPENCOURSEWARE
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 CHULALONGKORN UNIVERSITY

หน้าหลักของวิชา > MIT OpenCourseWare > วิศวกรรมไฟฟ้าและวิทยาศาสตร์คอมพิวเตอร์ > สัญญาณและระบบ, ฤดูใบไม้ร่วง 2003

6.003 สัญญาณและระบบ, ฤดูใบไม้ร่วง 2003 (Signals and Systems, Fall 2003)

รหัสวิชา 6.003 เมื่อถูกวางให้เป็นภาพสะท้อนของใจความหลักในวิชาสัญญาณและระบบ (ภาพนี้ได้รับความเอื้อเฟื้อจากศาสตราจารย์ อลัน โวลสกี)

จุดเด่นของวิชานี้
 วิชาที่น่าสนใจของที่สุดของส่วนบรรยายการสอน นอกจากนี้แล้วยังมีข้อสอบพร้อมเฉลยเตรียมไว้ให้ด้วยในหัวข้อ **ข้อสอบ**

รายละเอียดของเนื้อหาวิชา
 วิชานี้ครอบคลุมพื้นฐานของการวิเคราะห์สัญญาณและระบบ พร้อมกับการประยุกต์ใช้ซึ่งได้ป็นมาจากกรอบ การประมวลผลภาพและเสียง การสื่อสาร และการชักตัวอย่าง (sampling) และการประมวลผลเวลาต่อเนื่อง (discrete-time signal processing) ของสัญญาณเวลาต่อเนื่อง การกล่าวถึงสัญญาณ

Center for E-Learning
 Faculty of Engineering
 Chulalongkorn University

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 Your use of the MIT OpenCourseWare site and course materials is subject to the conditions and terms of use in our Legal Notices section.

MIT OCW Mirror Site

Daily visit report

Number of visitors/uniq IPs

Time increment

Powered by 123 Log Analyzer, www.123logalyzer.com

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 Chulalongkorn University

MIT OCW Mirror Site

Total Hits	32488	Total Visitors	1656
Total Cached Hits	353	Average Visitors Per Day	55
Average Hits Per Day	1082	Average Time Spent	1228 Sec
Average Hits Per Hour	45	Average PageViews per visitor	5.68
Average Hits Per Visitor	19.6	Average Downloads per visitor	4.52
Average Data Transferred per Hit	17.1 KB	Average Data Transferred per Visitor	1356.8 KB

Center for E-Learning
 Faculty of Engineering
 Chulalongkorn University

MIT OCW Thai Site

Daily visit report

Number of visitors/uniq IPs

Time increment

Powered by 123 Log Analyzer, www.123logalyzer.com

Center for E-Learning
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 Chulalongkorn University

MIT OCW Thai Site

Total Hits	85182	Total Visitors	6546
Total Cached Hits	8868	Average Visitors Per Day	218
Average Hits Per Day	2839	Average Time Spent	175 sec
Average Hits Per Hour	119	Average PageViews per visitor	1.05
Average Hits Per Visitor	13	Average Downloads per visitor	4.77
Average Data Transferred per Hit	38.4 KB	Average Data Transferred per Visitor	499.8 KB

Chula OCW

- The Open Courseware concept agrees with the mission of Chulalongkorn University to give the knowledge to the society without discrimination
- Chulalongkorn University becomes a member of the OCW Consortium and is undergoing a project to launch its own open courseware site— Chula OCW
- Chula OCW will give everybody access to course materials taught at Chulalongkorn University
 - Starting with 10 subjects in the first phase

Educational Liberalization

- OpenCourseware is a liberalization of education system
- Higher education institutes have the responsibilities to education the society and the nation in a non-discrimination manner
- Governments and NGOs should encourage and support educational liberalization movement
- Governments should clearly differentiate open education from intellectual property protection issues
- Open education is a vehicle for continuing education, thorough which educational society can be built and sustained