付　属　資　料

1．タマサート大学工学部関連

2．タイ国・第７次経済社会開発計画

3．生産工学科関連資料

4．電気工学科関連資料（カリキュラム）

5．機械工学科関連資料

6．化学工学科関連資料

7．関連教育機関等資料

付属資料　1．タマサート大学工学部関連

① 学部評議会名簿
② 学部運営組織構成員名簿
③ Faculty Administration Board
④ 学部教官・技官名簿
⑤ 留学中教官一覧
⑥ 公務員給与表
⑦ 教官の昇格基準
⑧ 工学部教官研究テーマ
⑨ 工学部各学科配置図
⑩ モンクット王工学大学ラッカバン校関連予算
⑪ 長期調査聞き取り調査結果

① 学部評議会 (Board of Faculty) 名簿　　1993年

1,Chairman　Assoc.Prof. Sathaporn Kalekinta

2,members

1,Prof.Dr Naksitte Coovattanachai

2,Prof.　Krirkkiat Phipatseritham

3,prof.Dr.Prida Wibulswas

4,　Dirak Charoenphol

5,Asst.Prof.Dr. Atthakorn Glankwamdee

6,Asst.Prof.　Sunee Praparntanatorn

7,　Dr. Somnuke Praparntanatorn

8,　Chaisak Pisitpaibool

9,　Pomgtorn Dhupatemiya

10,　Parichart Baisak

11,　Naris Charoenporn

12,　Dr. Uruya weesakul

13,　Watanachai Sumittakorn

② 学部運営組織構成員名簿　　(1994年2月現在)

1.Dean office

Dean		
Acting Dean	Sathaporn Katekinta	(Assoc.Prof.civil)
Assistsnt Dean		
Administration	Somnuke Praparntanatorn	(Ph.D civil)
Academic Affair	Chaisak Pisitpaiboon	(lecturer civil)
Reseach & Foreign Affair	Uruya Weesakul	(Ph.D civil)
Planning & Dvelopment	Parichat Baisak	(lecturer inderstrial)
Student Affair	Watanachai Smittakorn	(lecturer civil)

2.Secretary office

Secretary	Vanee Suntad
Administration head	Yupa Chatamawong
Finance & Purchasing	Orasa Linsanguan
Plannig & Policy	Chanchai Themlakxame
Academic Affair	Pramual Buangam
Building & Facility	Manop Toopthong
Research & foreign Affair	Nongnarot Tochomongarom

3.Department office

EE. Head	Jarree Demeechai
IE. Head	Jirawan Kloypayan
CE. Head	Somnuke Praparntanatorn
ME. Head	Sunee Coovattanachai
ChE.Head	Pongtorn Dhupatemiya

③ Faculty Administration Board

1. Chairman　　Faculty of the Dean

2. Members

1. Assistant Deans

2. Head of Department

3. Secretary of Faculty

4. Head of Computer Center

Department Committee

1. Chairmann　Head of Department

2. member　　Academic staffs

4

Committee

1, Committee of Computer and Information Center

2, Committee of Building and Facilities

3, Committee of Special Activities

4, Committee of Academic Affair

④ タマサート大学工学部教官・技官名簿

電気工学科

	氏　名	年齢	博士課程	修士課程	卒業大学		職歴
1	Jarree Demeechai	27		A.I.T Telecommunication	コンケン大学	1989	89-90 Sriracha Lion Industry
2	Narong Baubthong	26		A.I.T computer science			
3	Supachai Vorapojpisut	23		チュラ大 Contorol System Theory	チュラロンコン大学	1990	90-92 チュラ 大実験助手
4	Wichian Youyongwatana	23			チュラロンコン大学	1990	
5	Pichai Aree	23			ﾓﾝｸｯﾄ 三工科大学ﾄﾝﾌﾞﾘ	1990	
6	Taweesak Kijikanjawarat	25		A.I.T Computer network	カセサート大学	1989	89-90 Sahviriya Information Co:Ltd (S.E)
7	Somchart Chokchaitam	24			チュラロンコン大学	1991	89-90 Jasmine Co:
8	Wanchai Pijitorojana	33		A.I.T Computer Technology	ﾓﾝｸｯﾄ 三工科大学ﾃｶﾊﾞﾝ	1985	85-86 Worachak International Co:Ltd　87-88 Cadsys Computer
9	Paiboon Nakmahachalasin	22			ﾓﾝｸｯﾄ 三工科大学ﾃｶﾊﾞﾝ	1991	
10	Sunya Mitaim	23			ﾓﾝｸｯﾄ 王工科大学	1990	
11	Jintana Choungeham						
12	Sak Ruangprayoon						
13	Chatchai Surawattanaboon						
14	Wongkol Rojjanasei						
15	Waipbot Srithvn						
16	Somboon Lhaksup						
17	Nopphadol Thaiankhwan						

生産工学科

	氏　名	年齢	博士課程	修士課程	卒業大学		職歴
1	Naris Charonenporn	28		チュラ大 生産工学	カセサート大学	1988	90-92 サイアム大学助手　92 チュラ大実験助手
2	Parichat Baisak	26		A.I.T 生産工学 & Management	コンケン大学	1989	89-90 S.P.S Inderstries
3	Jirarat Theerawarapruk	22			カセサート大学	1991	
4	Samerjit Tantaseraneewat	25			コンケン大学	1991	
5	Somsak Chuakitisak	41			コロン大学	1981	82-93 DOUE教官
6	Jirawan Kloypayan	30		チュラ大 生産工学	チュラロンコン大学	1984	85-87 Thai Ceramic Industry Co:LTD.
7	Sawat Pararach	29			KMITN	1984	93　ランシット大学助手
8	Janya Suranowarath	29		テキサス工科大学	チュラロンコン大学	1988	
9							
10	Montalee Nagswasdi	28		ピッツバーク大学	ボストン大学	1989	
11	Chairath Tantipaibulvut	33			KMITT	1986	86-90 Good Year (Thailand) Co:LTD.
12	Chaosuan Kanchanomai	22			カセサート大学	1991	
13	Woraset Nitianan						
14	Pisit Boonsua						
15	Somsak Boonpuang						
16	Sakchlerm Phopitak						

土木工学科

	氏　名	年齢	博士課程	修士課程	卒業大学	職歴
1	Somnuke Praparntanatorn	36	大阪大学			
2	Chaisak Pisitpaibool	33		コンケン大学		87-92 チェンマイ 大学助手
3	Boonsap Witchayangkoon	24			KMITT	92-93 カセムバンディト大学助手
4	Sunisa Katchamart	27		A.I.T		
5	Watanachai Smittakorn			チュラ大		
6	Sayan Sirimontree	31		チュラ大		
7	Winai Raksuntorn					
8	Chivaluck Pongburanakit			A.I.T		
9	Sacharat Buddhawanna				コンケン大学	
10	Weeraya Sae-Tie					
11	Sathaporn Katekinta					
12	Uruya Weesakul	26	モンテペリル大学 (仏)	A.I.T		
13	Burachat Chatveera	27		A.I.T		
14	Kasemchart Sriwalai					
15	Danai Watnakorn					
16	Jesada Chomdoungtip					
17	napadol Wongkonthong					

化学工学科

	氏　名	年齢	博士課程	修士課程	卒業大学	職歴
1	Pongtorn Dhupatemiya	27		京都大学 Hydrocarborn Chemistry	京都大学　1990	
2	Satok Chaikunchensakun	24			チュラロンコン大学　1991	
3	Prodpran Siritheerasas	26			チュラロンコン大学　1990	
4						

機械工学科

	氏　名	年齢	博士課程	修士課程	卒業大学	職歴
1	Sunee Coovattanachai	48		アルバータ大学	チュラロンコン大学　1996	77-90 プリンスソンクラー大学講師

⑤ 留学中工学部教官一覧表

1994年2月

	氏　名	留学先学科	研究課題	期間	大学名	国名	基金
1	Chairath Tantipaibulvut	Manufacturing Engi	Manufacturing Engi.	60ヶ月	Loughboroush University of Technology	UK	MOUA
2	Chaosuan Kanchnomai	Mechanichal Engi.	Design of Dies for Metals(CAD/CAM)	60	University of Southern California	USA	私費
3	Paiboon Nakmahachalasint	Electrical Engi.	Poewr Electoronics	66	University of Furorida	USA	MOUA
4	Wanchai Pijitrojana	Computer Tech.	Parallel Processing	66	Oregon State University	USA	私費
5	Kasemchart Sriwalai	Civil Engi.	Soil Engi.	66	Oregon State University	USA	MOUA
6	Somchart Chokchaitam	Electrical Engi.	Comunication	48	University of Rochester	USA	MOUA
7	Sanya Mitaim	Electrical Engi.	Electronics & Computer Engi.	60	University of Southern California	USA	MOUA
8	Montaree Nagswasdi	Industrial Engi.	Manufacturing Engi. & Operation management	48	University of Nothingam	UK	TU
9	Danai Wantanakorn	Civil Engi.	Construction Management	48	University of Nothingam	UK	TU
10	Chanathip Namprempre	Computer Engi.	Computer ARC	126	Cambridge	UK	私費
11	Weerachai Asawamethapant	Electrical Engi.	Power Electronics	120	Chiba	JAPAN	私費
12	Nawin Somyat	Electrical Engi.	Distributed Computing	126	University of Manchester	UK	私費
13	Witawats Satasook	Mechanichal Engi.	CAD/CAE/CAM	66	California State University	USA	私費
14	Charkree Maleevan	Electrical Engi.	Electrical Engi. & Computer Science	48	IIT	USA	MOUA

※ MOUA:Ministry of University Affair TU:Thammasat University

⑥ 公務員給与表

単位　バーツ

	1等級	2等級	3等級	4等級	5等級	6等級	7等級	8等級	9等級	10等級	11等級
18	6,350										
17	6,100										
16	5,860										
15	5,630		9,700	11,920	14,770	18,440	22,350	27,100			
14	5,410	7,610	9,350	11,460	14,200	17,510	21,500	26,060	31,990		
13	5,200	7,320	8,970	11,020	13,500	16,640	20,550	25,060	30,760	37,740	
12	5,000	7,040	8,620	10,600	12,980	16,000	19,590	24,100	29,580	36,290	42,520
11	4,810	6,770	8,290	10,190	12,450	15,380	18,840	23,170	28,440	34,890	40,880
10	4,620	6,510	7,970	9,800	12,000	14,790	18,120	22,280	27,350	33,550	39,310
9	4,440	6,200	7,660	9,420	11,540	14,220	17,420	21,420	26,300	32,260	37,800
8	4,260	6,010	7,360	9,050	11,090	13,660	16,740	20,580	25,270	31,000	36,320
7	4,080	5,760	7,060	8,680	10,640	13,100	16,060	19,740	24,240	29,740	34,840
6	3,900	5,510	6,760	8,310	10,190	12,540	15,380	18,900	23,210	28,480	33,360
5	3,720	5,260	6,460	7,940	9,740	11,980	14,700	18,060	22,180	27,220	31,880
4	3,540	5,010	6,160	7,570	9,290	11,420	14,020	17,220	21,150	25,960	30,400
3	3,360	4,760	5,860	7,200	8,840	10,860	13,340	16,380	20,120	24,700	28,920
2	3,180	4,510	5,560	6,830	8,390	10,300	12,660	15,540	19,090	23,440	27,440
1	3,000	4,260	5,260	6,460	7,940	9,740	11,980	14,700	18,060	22,180	25,960

※下線給与は大卒教官の初任給

⑦ 教官の昇格基準

教官の昇格や給与は、体系化され、公表されており、規定に基づいて実施されている審査手順は以下の通り。

・昇格申請書を教官自身にて作成し、学部長に提出する。
・学部長は、昇格審査委員会（学部内各学科１名部外者１名による構成）に審査を依頼する。
・審査委員の中から精査委員を選出しする。
・精査委員は申請書・業績内容を審査し、結果を審査委員会に報告する。
・昇格審査委員会は、精査小委員会よりの報告を踏まえ、審査結果を出す。
・昇格審査委員会は、結果を学部長に報告する。
・学部長は学長に報告する。
・学長が最終決定。

審査対象は、教育経験年数、教育・研究実績で、昇格に必要な教育経験年数と研究業績は以下の通り。

昇格基準

職　　名	教育経験年数	教育・研究業績
Lecturer	大学卒	――――
Lecturer → Assist.Prof.	学士９年 修士５年 博士２年	３０点以上
Assist.Prof → Assoc.Prof.	――――	５０点以上
Assoc.Prof. → Proffesor	――――	７０点以上

教育・研究業績評価基準

業績の内容			評価点
教育		・学士を卒業させる。	0 点／人
		・修士を卒業させる。	5
		・博士を卒業させる。	10
研究	論文	・外国雑誌・内外学会誌（審査有）	30 点／論文
		・国内雑誌・内外学会誌（審査無）	20
	報告資料	・外国	15 点／論文
		・国内	7
	著書	・外国で出版（自分の講義に使用）	20 点／科目
		・国内で出版	15
	制作	・理論的裏付け・応用性が有り公表されること	30 点／作品
		・学生実験用	10
		・独創性が有り教育に有用と評価されるもの	20

（備考）

1、連名の有る場合は人数で割る。但し、連名者の了解に基づき加点も有り得る。

2、雑誌は世界的に権威の有るもの。

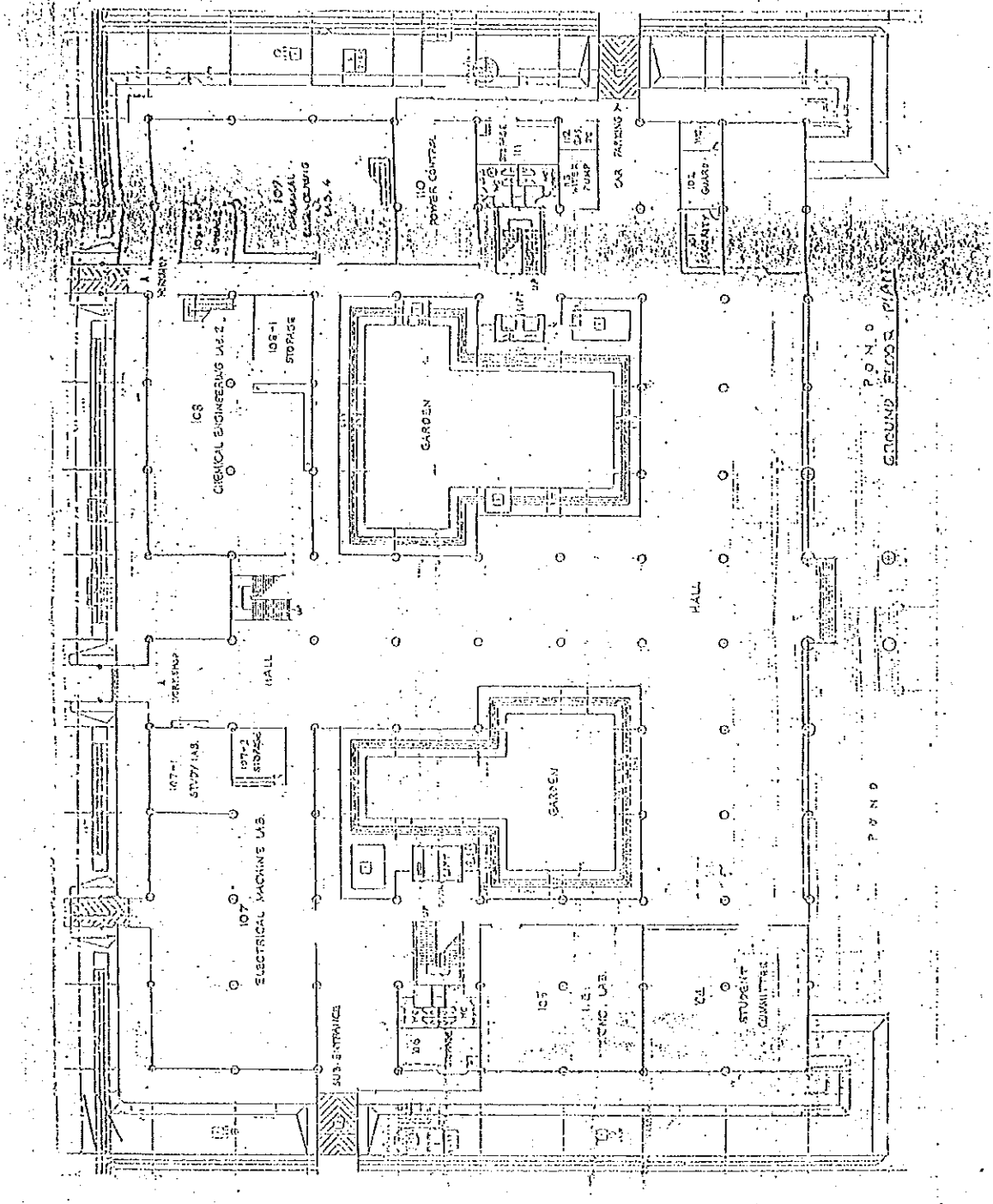
3、申請する場合は、審査対象となる特別に柱となる業績が必要。

4、この点数制度は今後とも見直される。

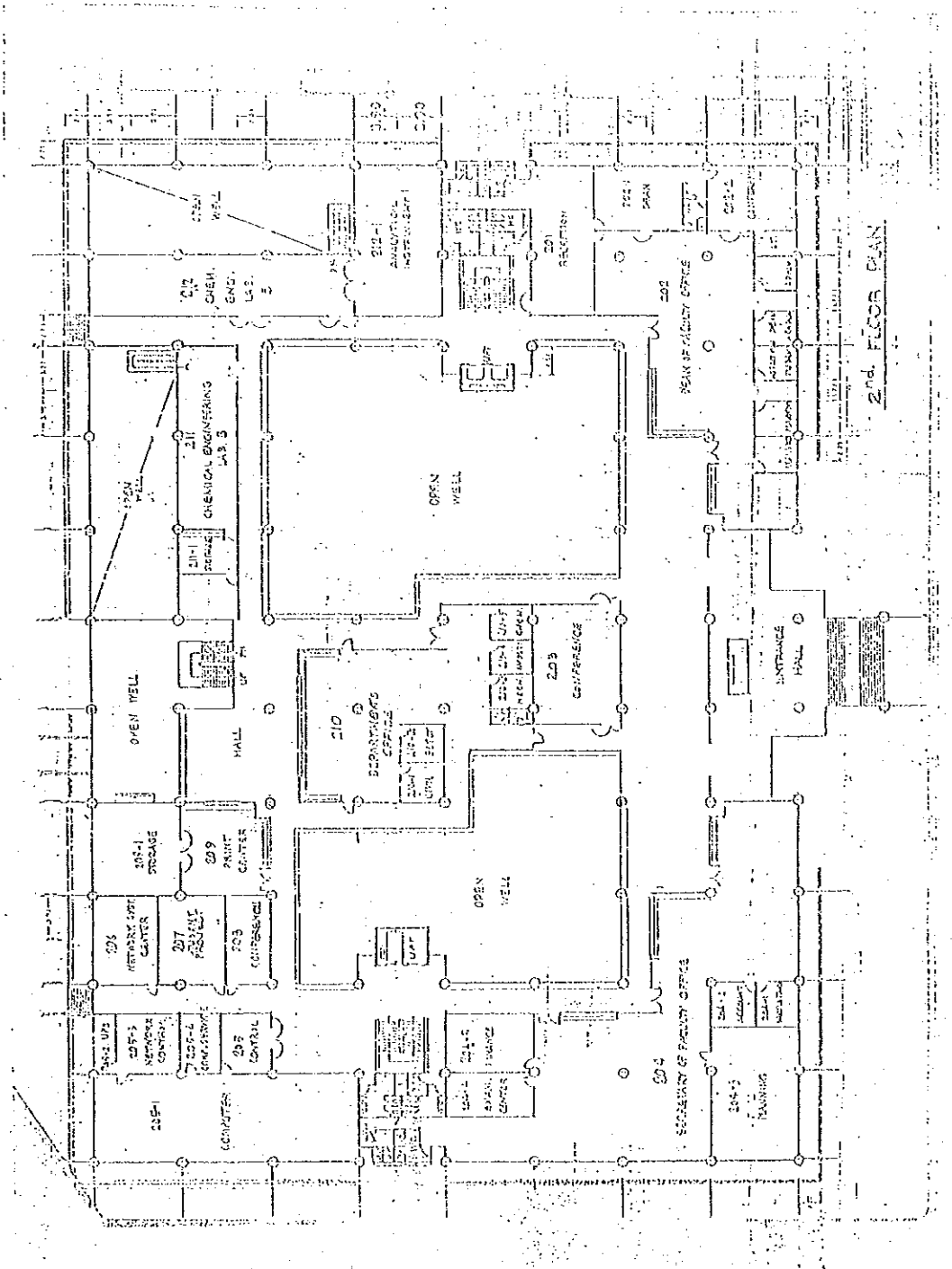
⑧ 工学部教官研究テーマ

氏名	学科	テ ー マ
1, Wanchai	EE	Linking the Suncore with a set of Graphics Application Programs.
2, Jirawan	IE	A Simplifiied Method of Analysis for Flat Plate Structures.
3, Parichart	IE	Economic Evaliation of an Export Processing Zone in Thailand.
4, Montree	IE	Mechanical Properties of Lisal Fiber-Metal Composities Containing Rice Husk Ask.
5, Naris	IE	Study of Ergonomic Resign of Industrial Sewing Workstation.
6, Jirarat	IE	Production Planning in a Germent Factory by Using the Part Lab Technic.
7, Dr. Somnuk	CE	Corrosion of Steel in Concret
8, Dr. Uruya	CE	Contribution of Remort Sensing and Numerial Geography Information to the Understanding of Hydrological Process of Small Mediteranean Basins.
9, Suniser	CE	Subsoil Improvement of a Reclaimed Land by Stage Preloading.
10, Pongsak	CE	The Infulence of Subfides on Properties of Portland Cement.
11, Chaisak	CE	Feasibility study of Damper Application to High-Rise Building.
12, Sunee	ME	Effect of Hoop Confinement on Strength of Post-Tentioned Anchorage Zones.

Appendix A: Faculty's Buildings

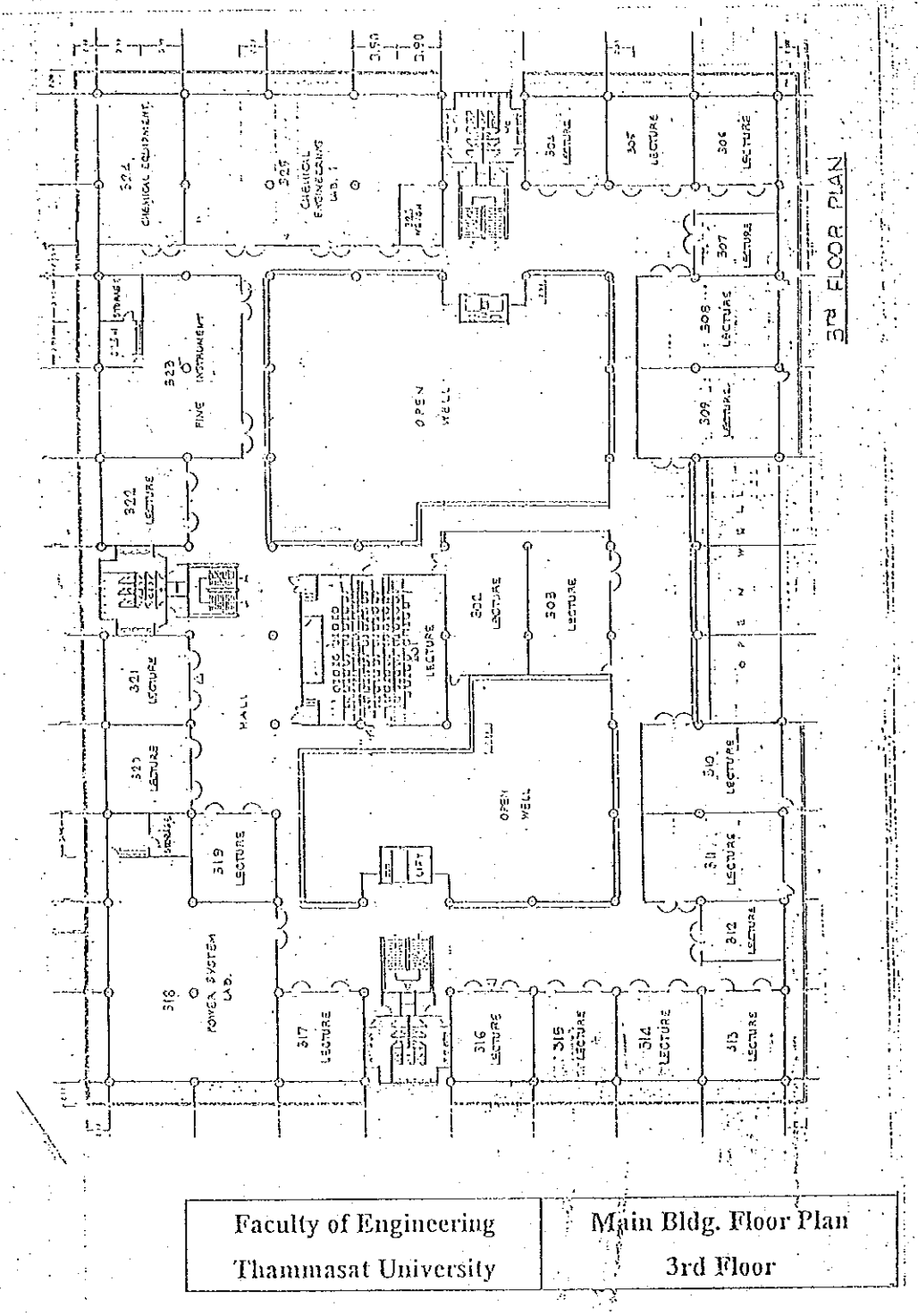


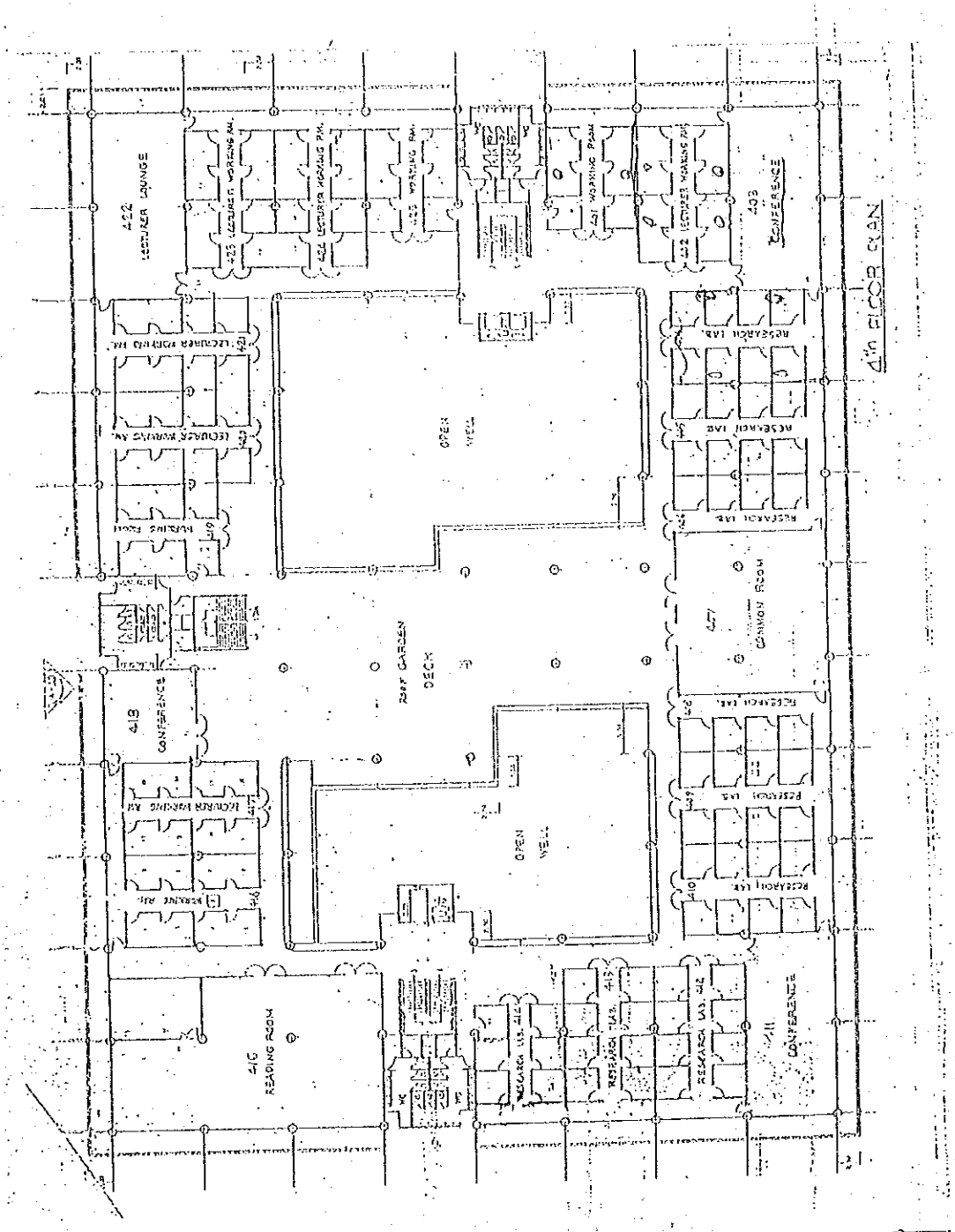
Faculty of Engineering Thammasat University	Main Bldg. Floor Plan Ground Floor



Faculty of Engineering Thammasat University	Main Bldg. Floor Plan 2nd Floor

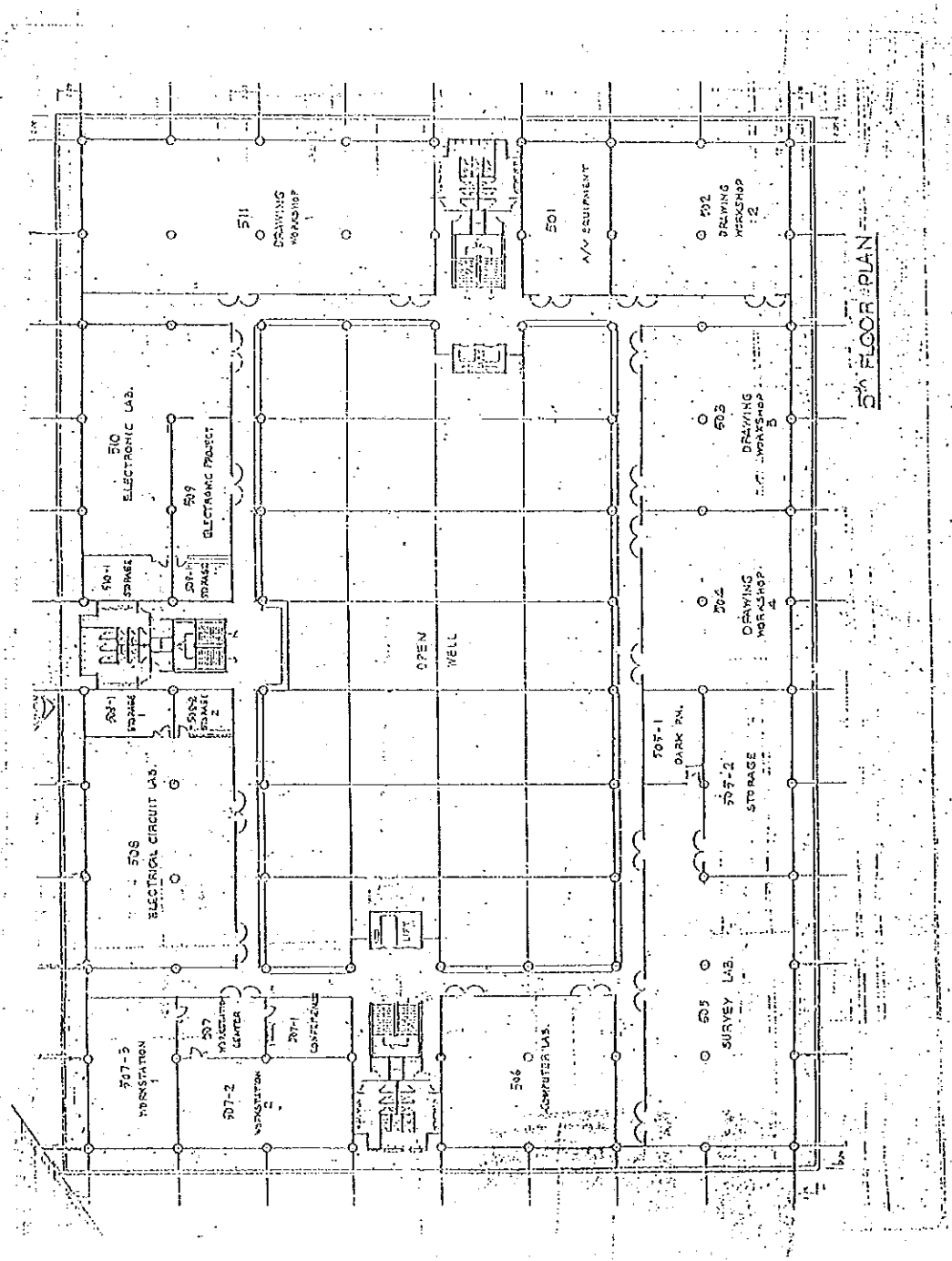
16


3RD FLOOR PLAN
OPEN WELL
OPEN WELL
HALL
324 CHEMICAL EQUIPMENT
325 CHEMICAL ENGINEERING LAB. 1
323 FINE INSTRUMENT
322 LECTURE
321 LECTURE
320 LECTURE
319 LECTURE
316 POWER SYSTEM LAB.
317 LECTURE
316 LECTURE
315 LECTURE
314 LECTURE
313 LECTURE
312 LECTURE
310 LECTURE
311 LECTURE
309 LECTURE
308 LECTURE
307 LECTURE
306 LECTURE
305 LECTURE
304 LECTURE
302 LECTURE
303 LECTURE
Faculty of Engineering
Thammasat University
Main Bldg. Floor Plan
3rd Floor

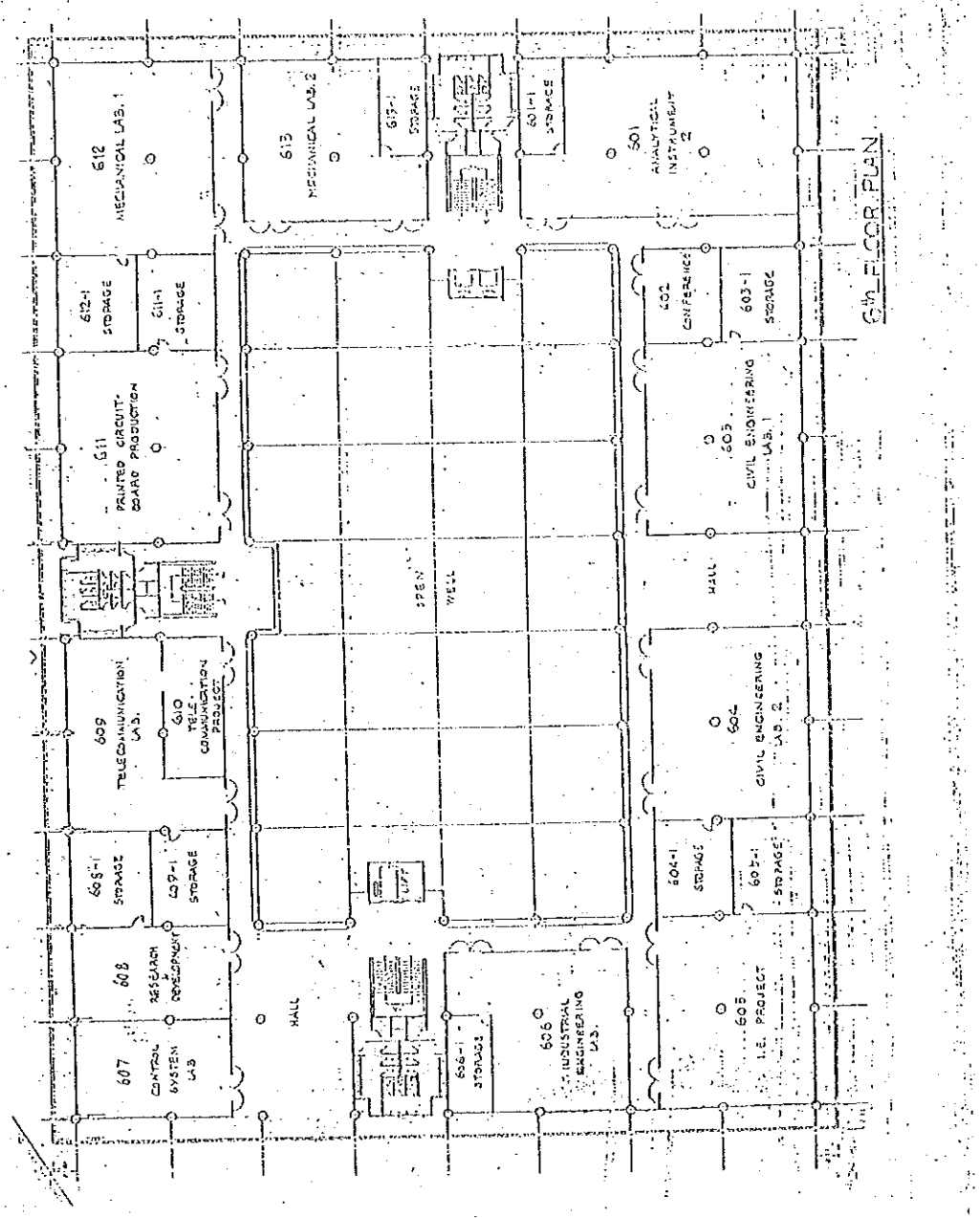


Faculty of Engineering Thammasat University	Main Bldg. Floor Plan 4th Floor

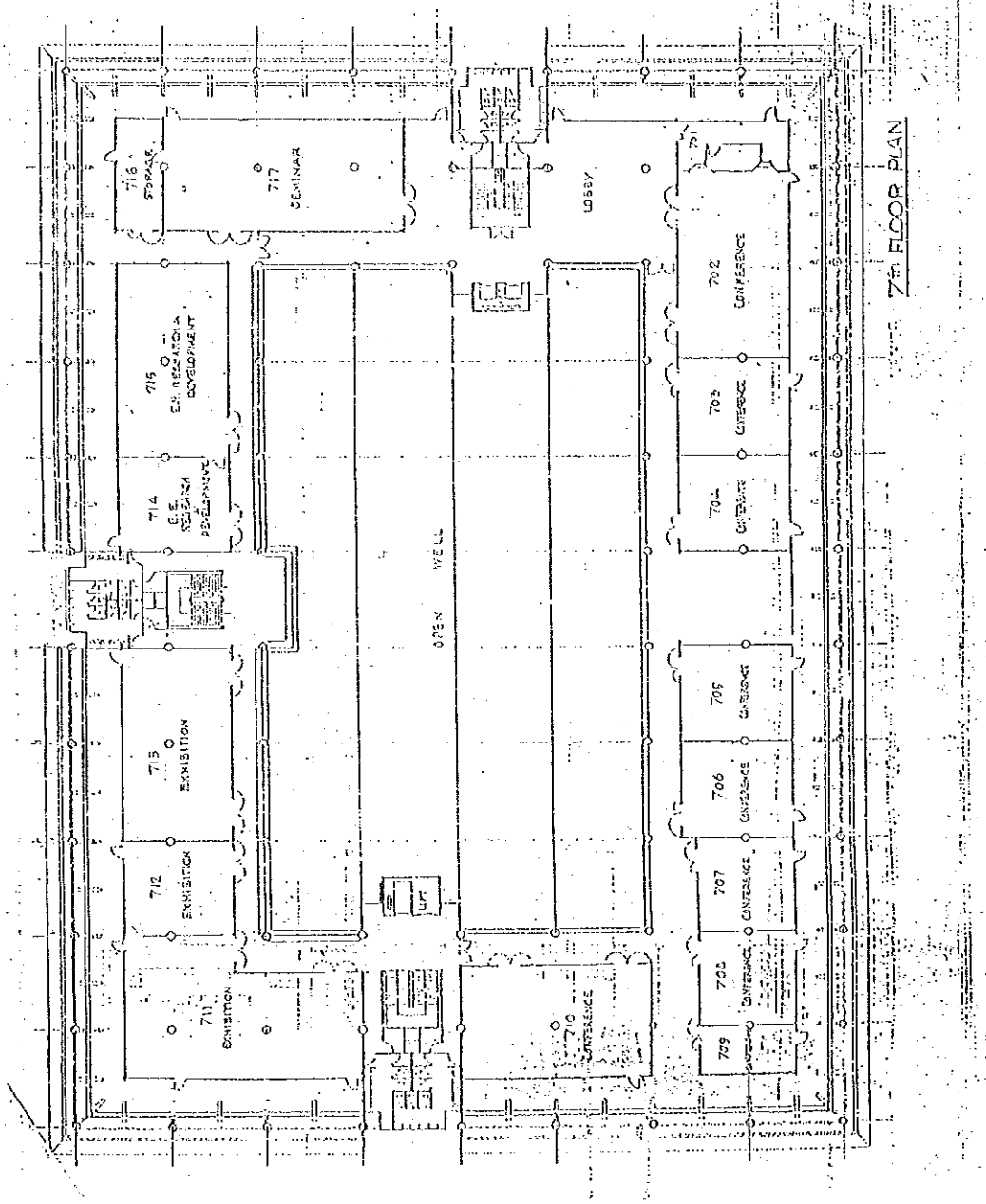
1 8



Faculty of Engineering Thammasat University	Main Bldg. Floor Plan 5th Floor



Faculty of Engineering Thammasat University	Main Bldg. Floor Plan 6th Floor



Faculty of Engineering Thammasat University	Main Bldg. Floor Plan 7th Floor

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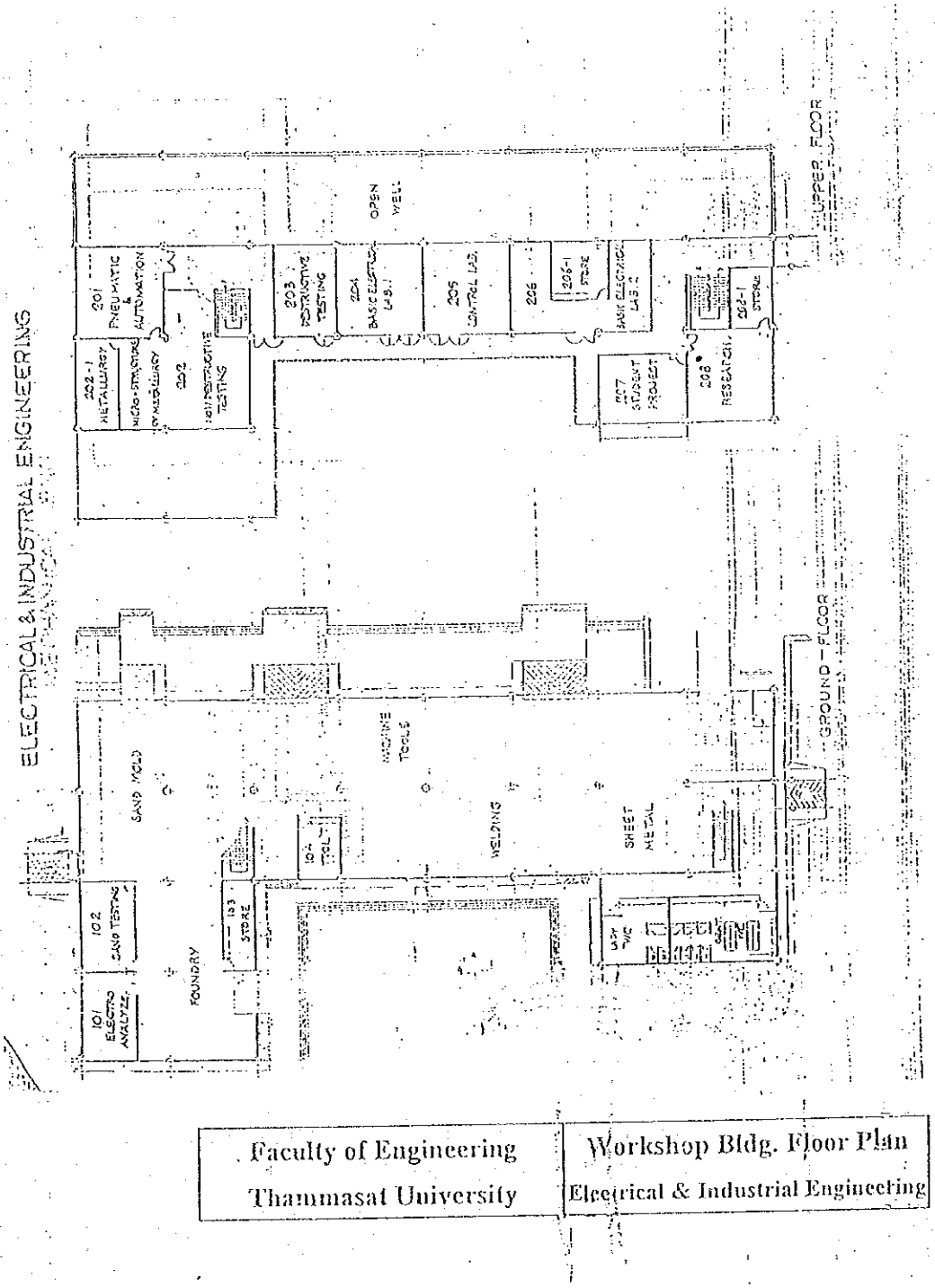
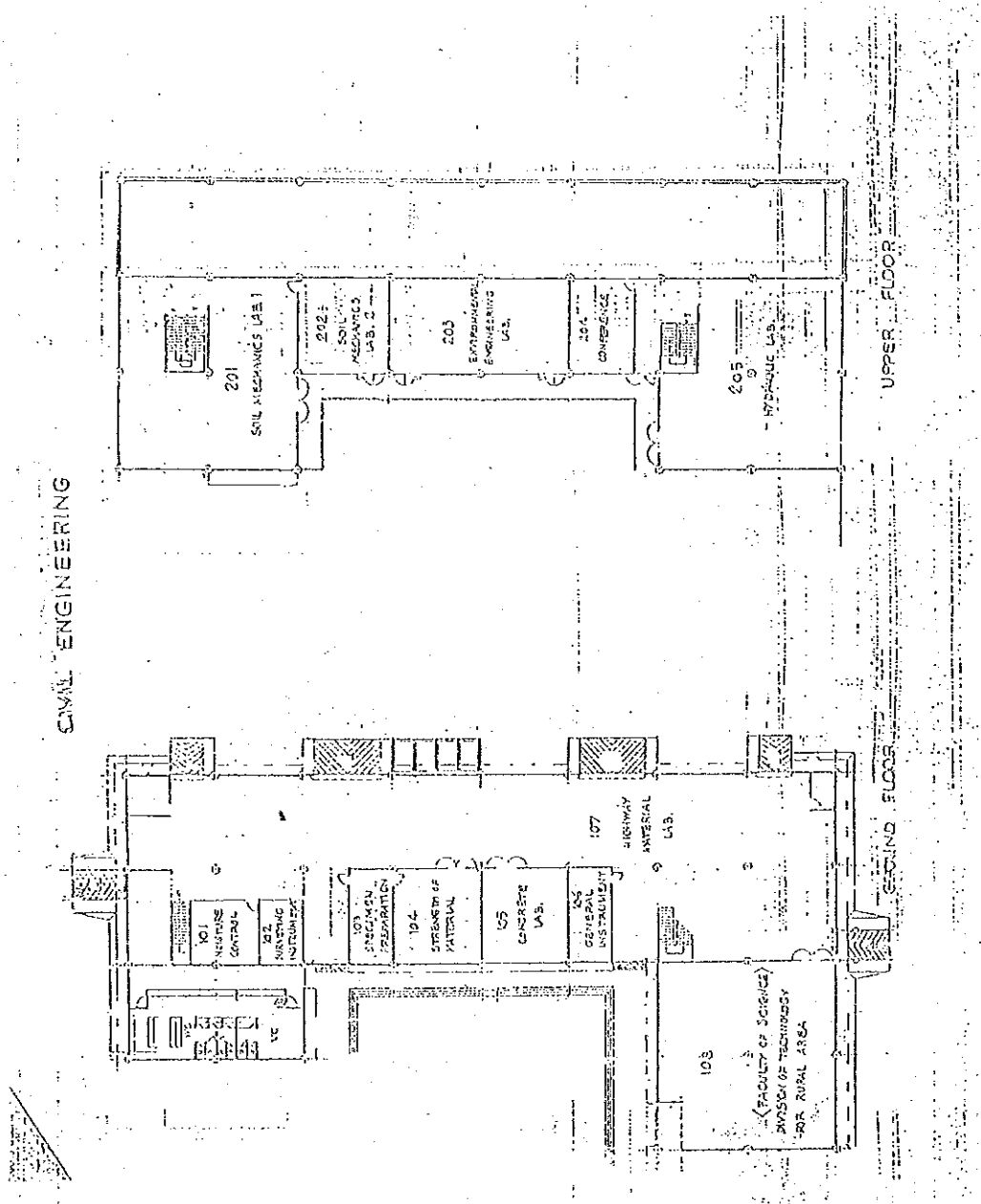


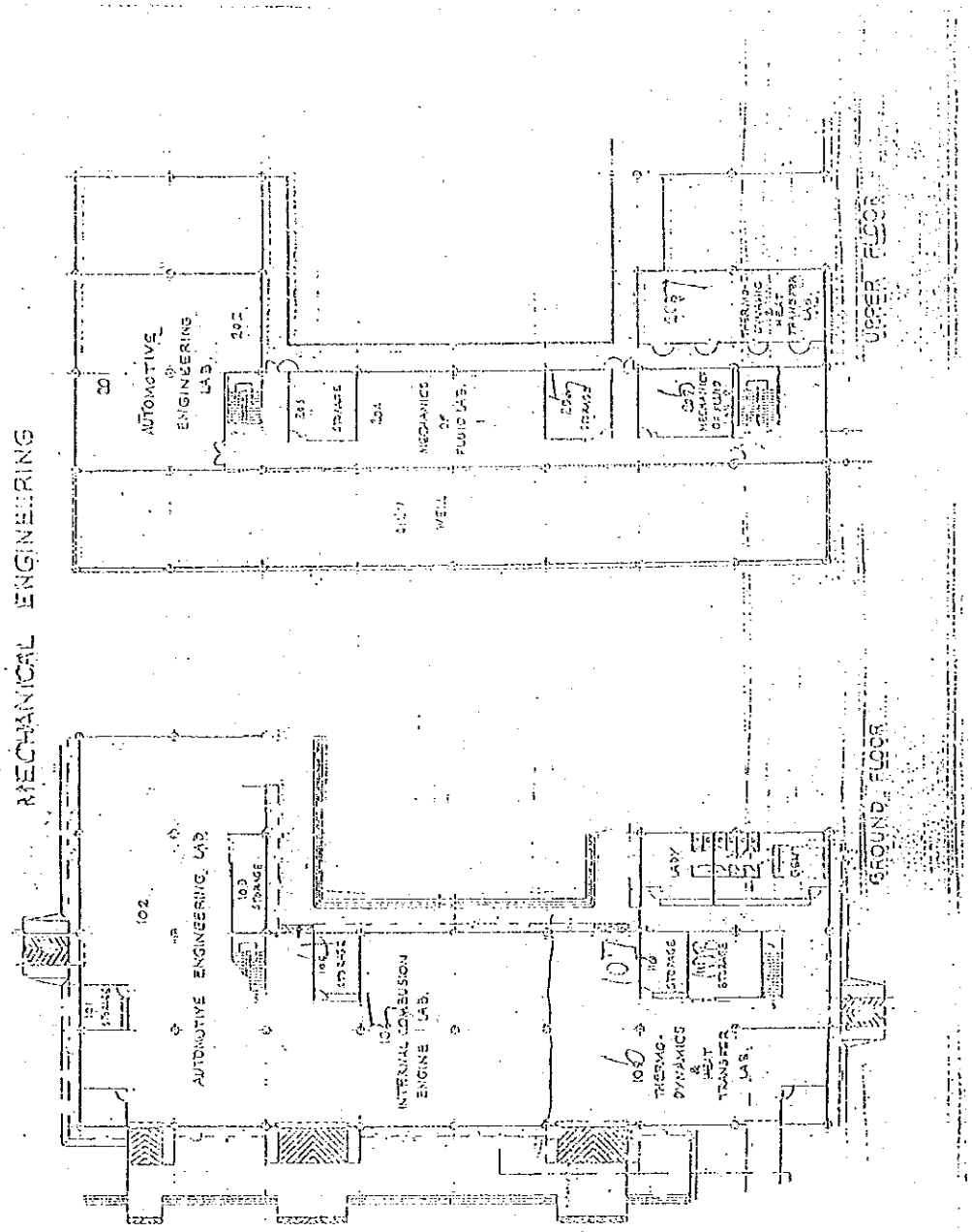
Faculty of Engineering Thammasat University	Workshop Bldg. Floor Plan Electrical & Industrial Engineering

(9/10)



Faculty of Engineering	Workshop Bldg. Floor Plan
Thammasat University	Civil Engineering

(10/10)



Faculty of Engineering	Workshop Bldg. Floor Plan
Thammasat University	Mechanical Engineering

⑩ モンクット王工学大学ラッカバン校関連予算

Budget from the Thai Government, FY 1994

Office/Faculty	Personnel	Materials	Equipment	Research	Maintenance	Construction	Miscellaneous	(Million Baht) Total
Rector's Office	16.59	1.79	11.03	-	1.57	28.45	31.82	91.25
Engineering	42.65	18.14	31.52	7.51	0.38	74.98	23.90	199.08
Architecture	25.13	5.42	2.69	-	0.41	12.07	2.27	48.59
Industrial Education	14.99	4.65	2.93	0.28	0.15	6.39	3.06	32.45
Science	20.02	6.90	18.56	3.23	0.48	71.81	4.03	125.03
Agricultural Technology	22.60	8.29	3.40	0.72	0.49	1.37	3.73	3.73
Computer Center	4.06	2.77	19.46	1.42	2.33	-	2.24	32.28
Graduate School	0.84	0.07	0.54	2.16	0.02	-	0.06	4.13
Central Library	2.03	5.88	-	-	0.03	34.06	0.74	42.74
Chumporn Study & Research Center	0.39	0.12	-	-	0.03	0.75	0.04	1.33
Information Technology	0.60	-	-	-	-	-	-	0.06
Grand Total	149.36	54.03	90.13	15.32	5.89	230.48	72.33	617.54

平成６年１月

⑪　長期調査聞き取り調査結果

化学工学科学科長　Mr.Pongtorn

・３月に大学入学試験は実施される。
・大学入試時の専攻選択を学部か学科にするかは大学により制度が異なる。
・将来期待できる勤務先も学生募集要項に記載されている。
・入学試験科目は、数学・化学・物理・英語・国語・適正試験の６科目で１科目１００点満点。
・入学試験の場所は地域を選択できる。
・私立大学の入試日は、大学により異なり、国立大学の試験日と同日に行う大学もある。
・学生は入学希望先を５ケ所選択し、指名することができ、成績順に希望の大学学部・学科に入学できる。
・理系と文系の同時指名は可能である。
・１９９３年６月、工学部４学科１６０人の入学を許可した。
・入学日は４月３日。
・１年生の終了時に専門分野を選択する。（１月）
・約２０人が化学工学科に進路を決定した。
・約３０人の工学部学生が奨学金を支給されている。
・各種委員会

Committee of Administrative Coorperation	学部長・副学部長・学科長
Board of Fuculty	
Committee of Student Affair	
Committee of Academic Affair	
Committee of Bulding and Facilities	
Committee of Computer Centre	
Department Committee	

・学部長は選挙後 University Council の承認を必要とする。
・教授になるには、申請後大学省の承認を必要とし、ポストにはよらない。
・教官の学外での仕事について、報告の義務はなく、記録は残らない。
・タマサート大学の規則により、学部ごとの図書館は所有できず、キャンパスに一ケ所と限定されている。
・現在の教官室の割り振りは、抽選により決定し、学科別の配置を考慮していない。
・化学工学の教員定員枠は１７～１９人で非常勤講師は予算により採用可能。
・教官の担当科目は学科長が決定している。

土木工学科学科長 Mr.Somunuke

・土木工学科は５０人の学生定員枠で１９９７年より６０人に拡大する計画。

・学生定員枠の拡大は独自に決定できる。

・２６人の教員定員枠。

・１９９３年１２月までは、Departmentではなく、Divisionの呼称を使用していた。

・工学部ビルは障害者を受入るための配慮はなされていない。

・各学科施設の管理責任者は学科長。

・共通の部屋は、Secretary Office　の管理責任。

・測量実習の野外実習を土木工学科では実施している。

・工学部において年次報告書を発行した実績はまだない。

・外部講師の招請手続き

Lecturer ➡ Accademic Affair ➡ Dean ➡ Recter ➡ 招待状発送

要請　学部長名による

招請状作成

・外部からの招待者用の宿泊施設は、キャンパス内の日本研究センターにある。

計画課担当の副学部長　Ms.Parichart

・１９９６年に大学院開設の実現可能性について調査・協議予定で、土木工学・生産工学分野の大学院コースを先行して開設する計画。

・学部の拡大計画はない。

・医務室があり、AM 10:00～PM 14:00まで毎日開業しており、看護婦と看護婦助手が勤務している。

・１９９４年より入学金として 5,000ﾊﾞｰﾂ 学生より徴収予定。　授業料はコースにより異なるが、約５０バーツ／単位　１００バーツ／コースの特別教材費を徴収している。

・人文・社会・言語学等の一般教養科目は大学省が決定する。

・他大学との単位の互換は規則上可能ではあるが、実施されたことはない。

・学外実習は大学からの紹介もしくは独自で捜し、大学から依頼する方法がある。

・学生の実習先を教官が訪問もしくは電話にて確認をする。

付属資料　2．タイ国・第７次経済社会開発計画

第 7次経済社会開発計画

第 7次経済社会開発 5ヶ年計画は、1992年～1996年を対象として策定された。ﾀｲ国は第 6次経済社会開発計画の目標であった、1)財政収支改善、2)対外収支の改善、3)経済の安定、をほぼ達成し、第 7次経済計画の目標に、国際経済の変化に左右されない国内の経済基盤の体質強化を掲げ、一層の経済成長と安定をめざしている。

第 7次経済社会 5ヶ年計画の 3つの目標を以下に記載する。

1) 経済、金融面の安定を維持しつつ、適正水準の経済成長率を維持
2) 地方への所得と経済発展成果の分散
3) 人的資源、生活の質、環境および天然資源開発の一層の推進

この目標を達成する為に、定量的なｶﾞｲﾄﾞﾗｲﾝが設定されている。例を上げると、上述した目標の内、3)生活の質、環境に関するｶﾞｲﾄﾞﾗｲﾝとして「大気における有害物質、例えば、CO、SO_2、NO_2、およびｶﾞｿﾘﾝ中の鉛を都市及び農村地域を通じて人々の健康に害を及ぼさないﾚﾍﾞﾙまで引き下げる」ことが掲げられている。

第 7次経済社会 5ヶ年計画の期間中に、経済の安定を維持しつつ9%の成長を達成するためには、工業、農業、ｻｰﾋﾞｽおよび貿易部門の構造調整ﾌﾟﾛｸﾞﾗﾑを一層推進することと、ｲﾝﾌﾗ・ｻｰﾋﾞｽとｴﾈﾙｷﾞｰの不足によって引き起こされる問題の解決が極めて重要である。また、科学技術の推進、成長及び安定の維持という目的に沿った金融、財政、および資本市場の整備も重要であるとの認識のもとに、各産業ｾｸﾀｰ毎の開発政策が立案されている。

科学技術開発政策の項目の中の「科学技術における人材開発」と題したﾃｰﾏでは以下のようなﾌﾟﾛｸﾞﾗﾑが構成されている。

(1) 適正な量と受容可能な質を備えた技術者、科学者、専門職および熟練労働者の養成をさらに促進する。加えて、国内大学院の科学技術ﾌﾟﾛｸﾞﾗﾑにおける民間部門の役割をより拡大することで既存ﾌﾟﾛｸﾞﾗﾑの改善を図る。また、大学教授、研究者を増員するために、海外の主要大学における修士、博士課程ﾌﾟﾛｸﾞﾗﾑへより多くの人材を派遣する。

(2) 特定の職業訓練基金または教育訓練施設の設立を奨励し、民間部門による訓練ﾌﾟﾛｸﾞﾗﾑの保有に高い優先度を与える。また、政府は民間企業にｲﾝｾﾝﾃｨﾌﾞを与えて、OJT(On the Job Training)を奨励する。

(3) ｱｶﾃﾞﾐｯｸな分野、特に研究開発に従事する人材の労働条件を改善する。広い経験を備えかつ資格を有する教授が民間部門からの仕事を引き受けるのを許可することを含め、給与、諸待遇の改善を図り、有能な人材を政府機関に留まらせることを重要な目標の一つとする。

また、「科学技術促進のためのｲﾝﾌﾗおよび管理ｼｽﾃﾑの開発」と題したﾃｰﾏでは、以下の様なﾌﾟﾛｸﾞﾗﾑが構成されている。

(1) 公的機関を独立性と柔軟性をより備えたものに再編成することにより、民間部門から認められ、尊敬されている有能なｽﾀｯﾌが、所属する職場に魅力を感じて研究機関に留まるようにする。また、教育機関の行う研究活動を奨励する。

2) 研究開発の成果を商業的に活用するため、公的研究機関、教育機関および民間部門間のﾈｯﾄﾜｰｸ形成に重点を置きつつ、公的研究機関の業務運営を改善する。

この様に、ﾀｲ国政府は、同国の産業を益々活性化させ、経済の安定成長を図るという第 7次経済社会開発 5ヶ年計画の目標達成には、高級技術者、研究者のより一層の育成が重要であるとの認識に立っている。

2.2 高等教育の現状

人口構成の変化、国際社会における将来の役割、経済成長、技術進歩、都市化、環境問題と天然資源、労働市場、社会環境の変化に対応するため、ﾀｲ政府は高等教育長期計画(Thailand's Long-Term Plan for Higher Education (1990-2004))を策定した。本計画は1990年からの15年間の変化を予測し大学教育の役割の変化を教育、研究の面から考察し、高等教育ｼｽﾃﾑの効率の向上策を提言し、 7つの政策を勧告している。
また第 7次経済社会 5ヶ年計画(1992-1996)並びに第 8及び第 9次計画(1997-2006)に於ける実施目的を規定している。第 7次計画期間においては、年間国家予算の少なくとも 22%は教育に配分し、教育予算の少なくとも 15%は高等教育に配分することになっている。また高等教育予算の少なくとも 10%は研究ﾌﾟﾛｼﾞｪｸﾄに割り当てられる。科学、医学、農学の分野での学生の定員を毎年 10%以上の割合で、また工学系の学生数は毎年 15%以上の割合で増員することになっている。

付属資料　3．生産工学科関連資料

① Deparatment of Industrial Engineering

② Equipments Received from Thai Government

③ Equipments Requested from Japanese Government

① Deparatment of Industrial Engineering

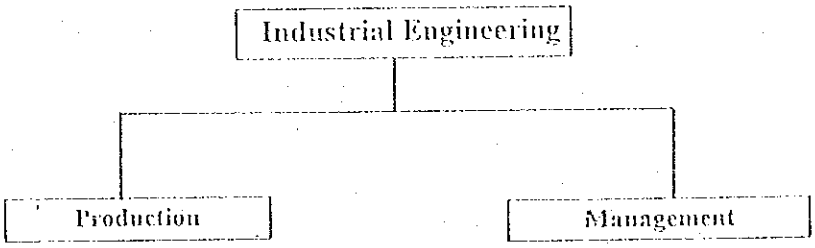
Department of Industrial Engineering

I General Background

The key word in industry today is "productivity". Significant productivity improvements demand that the industrial engineer focus on an under-standing of the technology involved in manufacturing processes as well as a knowledge of the management techniques.

The industrial engineering program is built upon a solid foundation in physical sciences, mathematics, engineering, humanities, and social sciences. It offers two major areas:production engineering and engineering management. The Department has extensive and well supported workshops, laboratories, and computing facilities, thus providing the students with a capability for working in various industries.

Organizations employing industrial engineers include independent consultants, manufacturers, banks, hospitals, transportation industries, energy suppliers, retail corporations, government/military and educational institutions.



Subjects in the Major
- IE 434 Computer Aided Manufacturing
- IE 435 Nondestructive Testing
- IE 436 Failure Analysis
- IE 455 Welding Engineering
- IE 456 Foundry Engineering
- IE 457 Principles of Metal Cutting
- IE 496 Special Topics in IE
- ME 322 Mechanics of Solidd II
- ME 392 Machine Design
- ME 415 Plant Engineering
- ME 425 Automatic Control System

Subjects in the Major
- IE 404 System Engineering
- IE 414 Computer Simulation
- IE 415 Management Information System
- IE 416 Maintence Management
- IE 442 Ergonomics
- IE 443 Industrial Hygiene
- IE 465 Advance Quality Control
- IE 466 Operation Research II
- IE 496 Industrial Packaging
- IE 496 Special Topics in IE

Figure 1 Diagram show that the detail of two major areas in Industrial Engineering

2. Planning in the future

The Plans will be start in 1995 which are consist of these :

2.1) To establish the graduate student program in master degree level.

2.2) To add the majors in Industrial Engineering Department. Five majors are opened in industrial engineering department which are special field . These are as show in figure2.

2.3) To enhance technology research and developement in industrial .

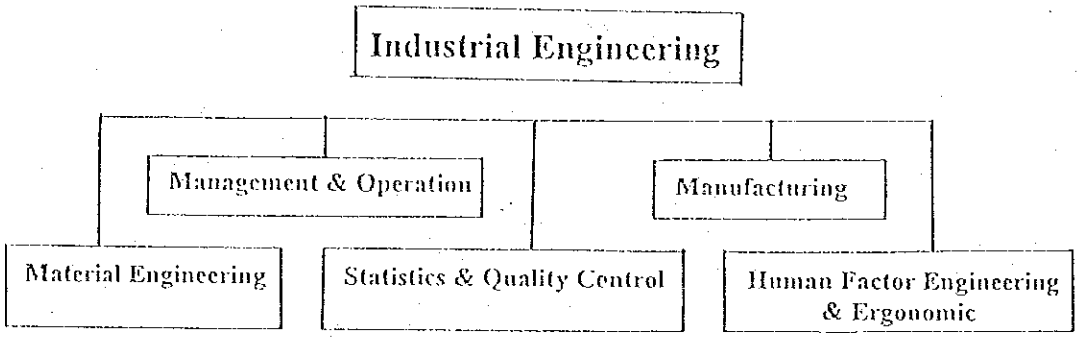


Figure 2 Diagram show that the detail of five majors in Industrial Engineering for planning in the future (to be start 1995)

3 Department Members

Head of Department:

Naris Charoenporn	M.Eng. (Industrial Engineering) Chulalongkorn Univiersity.

Lecturers:

* *Montalee Nagswasdi*	M.S.(Industrial Engineering), University of Pittsburgh
* *Chairath Tantipaibulvut*	B.Eng. (Production Engineering), King Mongkut's Institute of Technology Thonburi
Parichat Baisak	M.Eng. (Industrial Engineering and management), Asia Institute of Technology
* *Chaevuan Kanchanomai*	B.Eng. (Industrial Engineering), Kasetsart University
Jirarat Theerawongwat	B.Eng. (Industrial Engineering), Kasetsart University
Sanerjit Tantaveekawat	B.Eng (Industrial Engineering) Khon Kaen University
Somsak Chaokittisak	Dipl.-Ing (equiv. B.Eng) Specialized College of Cologne
Jirawan Kheyyayan	M.Eng. (Industrial Engineering) Chulalongkorn Univiersity.
Sawat Paravach	B. Ind. Tech (Production Technology) King Mongkut's Institute of Technology (North Bangkok)
Janya Sanamowarath	M. Sc. (Industriel Engineering) Texas Tech University (USA.)

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* *On Leave or absence to pursue post-graduate study*

Part-time Lecturers

Professors:

Air Vice Marshal Kaeo Songkhao	Ph.D.(Industrial Engineering), Michigan State university, U.S.A
Ampika Krairit	M.S. (Industrial Engineering) Missouri State University, U.S.A.

Associate Professors:

Boonkiat Checwaragoongit	M.B.A., Nida M.Eng. (Industrial Engineering), Chulalongkorn University
Chaniana Juntaro	M.Eng., (Industrial Engineering), Chulalongkorn University
Sirichan Thongprasert	Ph.D., (Industrial Engineering), Texas Institute of Technology, U.S.A.
Kitti Inavanont	Ph.D., (Industrial Engineering), Texas Institute of Technology, U.S.A.

Assistant Professors:

Panya Srichande	Ph.D. (Metallurgy), Sheffield University, U.K.
Chulsiri Sringarmpong	B.Eng. (Industrial Engineering), King Mongkut's Institute of Technology Thonburi
Boonwa Thampitakkul	Docteur de 3e Cycle (Aixen-Provence-Marseille III)

Lecturers:

Jumnong Sorapipat	D. Eng (Industrial Engineering), Asian Institute of Technology
Pisal Yenradee	D. Eng (Industrial Engineering), Asian Institute of Technology
Wacharachan Sirisawannatosh	M.S. (Manufacturing System Engineering) University of Wisconsin-Madison, U.S.A.
Witoon Simachokedee	M.B.A. (Business Administration), Thammasat University
Jirasak Ratanaphaithun	M. Eng. (Environmental Engineering), Chulalongkorn University
Wisit Lojareanrat	M.Eng. (Industrial Engineering), Chulalongkorn University

CHAROENPORN, Naris

Date of Birth: 8 March, 1966
University Degree: Master's of Engineering
Position: Lecturer, Department Head
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:
1988 Kasetsart University, B.Eng. (Agricultural Engineering)
1992 Chulalongkorn University, M.Eng. (Industrial Engineering)
Job Experience:
1990-1992 Lecturer, Siam University
1992 Research Assistant, Ergonomic Laboratory, Chulalongkorn University
Used to lecture the Production Planning and Control subject
Used to lecture the Engineering Statistics subject
Present Activities:
- Biomechanical study for ergonomic design. (Research)
- Ergonomic design and CAD/CAM for developing Prosthetic Upper and Lower Limbs. (Research)

NAGSWASDI, Montalee

Date of Birth: 30 March, 1967
University Degree: Master's of Science
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Manufacturing Engineering, Industrial Engineering
Education:
1989 Boston University, College of Engineering, Bachelor of Science
1990 University of Pittsburgh, School of Engineering, Masters of Science
Job Experience:
1990 Lecturer, Thammasat University
Used to lecture the Material Science II
Used to lecture the Engineering Statistics
Present Activities:
Recent studies cover several fileds including production planning and control, concurrent engineering, computer integrated manufacturing.

(on leave of absence to pursue post-graduate studies)

TANTIPAIBULVUT, Chairath

Date of Birth: 26 February, 1961
University Degree: Master's of Science
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Manufacturing Engineering, Industrial Engineering
Education:
King Mongkut's Institute of Technology, Thonburi Campus
Job Experience:
1986-1990 Good Year (Thailand) Ltd.
1990-1992 Lecturer, Thammasat University
Present Activities:

(On leave of absence to pursue post-graduate studies)

BAISAK, Parichat

Date of Birth: 8 October, 1967
University Degree: Master's of Engineering
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:
1989 Khon Kaen University, Graduate School, Bachelor of Engineering
1991 - 1992 Asia Institute of Technology (AIT), M.Eng (Industrial Engineering and Management)
Job Experience:
1989-1990 S.P.S. Industries
1992 Used to lecture the Operation Research I subject
Used to lecture the Engineering Economy subject
Present Activities:
Lecturer of Engineering Economy Subject

KANCHANOMAI, Chaosuan

Date of Birth: 22 February 1972
University Degree: B.Eng. (Industrial Engineering)
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:
1991 Kasetsart University Thailand B.Eng (Industrial Engineering)
Job Experience:
1991-1992 Lecturer, Thammasat University
Present Activities:

(on leave of absence to pursue post-graduate studies)

TEERAVARAPRUG, Jirarat

Date of Birth: 15 April, 1971
University Degree: Bachelor of Engineering
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:
1991 Kasetsart University
Job Experience:
1992 Lecturer, Thammasat University
Used to lecture the Operation Reserch I subject
Used to lecture the Quality Control subject
Present Activities :
Lecturer of Quality Control Subject

TANTASERANEEWAT, Samerjit

Date of Birth: 4 May 1968
University Degree: Bachelor of Engineering
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:
1991 Khon Kaen University, B.Eng.
Job Experience:
1991-1993 Fujitsu (Thailand) co., Ltd.
1993 Lecturer, Thammasart University
Used to lecture the Quality Control subject
Present Activities:
Lecturer of Quality Control Subject (IE.362)
Lecturer of Engineering Drawing I

CHUAKITTISAK, Somsak

Date of Birth: 7 February 1953
University Degree: Dipl.-Ing. (equiv. B.Eng.)
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Machine Tools Design (Konstruktionstechnik-Werkzeugmaschinen)
Education:
1981 Specialized College of Cologne
(Fachhochschule Köln), B.Eng.(Mechnical Engineering)
Job Experience:
1981-1982 Worked with a German plant, achieving first professional practical experience.
1982-1993 Instructor, Shop master, Division Chief,
Assistant Director, by DOVE-Ministry of Education.
1993 Lecturer, Thammasart University
Used to lecture the Engineering Drawing I subject
Used to lecture the the Engineering Tools & Operations subject
Present Activities:
Lecturing, developing machine shop, preparing and planning CNC-Technology
Laboratory on the Campus of Thammasat University - Rangsit.

KLOYPAYAN, Jirawan

Date of Birth: 24 April, 1963
University Degree: Master's of Engineering
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:
1984 Chulalongkorn University, B.Sc. (Material Science)
1992 Chulalongkorn University, M.Eng. (Industrial Engineering)
Job Experience:
1985-1987 Lab Supervisor in Thai Ceramic Industry, Co., Ltd.
1991-1992 Industrial Engineer in I Garment, Co., Ltd
Present Activities:
Lecture of the Material Science I Subject and the Material Science II Subject.

PARARACH, Sawat

Date of Birth: 18 December, 1966
University Degree: Bachelor of Industrial Technology
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Production Technology
Education:
1984 King Mongkut's Institute of Technology North Bangkok, B. Ind. Tech.
Job Experience:
1993 Lecturer, Rungsit University.
Present Activities:
Lecture of the Engineering Tools & Operations
Lecture of the Manufacturing Process & Technology.
Lecture of the Automation.

SURANOWARATH, Janya
Date of Birth: 26 July, 1966
University Degree: Master's of Science
Position: Lecturer
Department of Industrial Engineering

Major Field of Study:
Industrial Engineering
Education:

1988	Chulalongkorn University, B.Sc. (Chemical Engineering)
1991	Texas Tech University, M. Sc. (Industrial Engineering)

Job Experience:

1991	Manager of Funiture Business
1991	Lecture of the Experimental Desing

Present Activities:
- Time and Motion Study for the "American Aircraft Project".
- Simulation for flight and schedule for airlines.

DEPARTMENT OF INDUSTRIAL ENGINNERING

The key word in industrial today is "productivity". Significant productivity improvements demand that the industrial engineer focus on an understanding of the technology involved in manufacturing processes as well as a knowledge of the management techiques

The industrial engineering program is built upon a solid foundation in physical sciences, mathemtics, engineering humanities, and social sciences. It offers two major arears: production engineering and engineering management. The department has extensive and well supported workshops, labolatories and computing facilities, thus providing the students with a capability for working in various industries.

Organization employing industrial engineers include independent consultants manufacturers, bank hospital, transportation industries, energy suppliers, retail corporations, government/military and educational institutions.

Curriculum Outline

Total credit requirements	150 credits
1. General Basic Courses	46 credits
1.1 Humanities	2 credits
1.2 Social Sciences	9 credits
1.3 languages	6 credits
1.4 Sciences and Mathematics	29 credits
2. Engineering Course	101 credits
2.1 Core Course	27 credits
2.2 Major Courses	74 credits
2.2.1 Compulsory courses	62 credits
2.2.2 Elective Courses	12 credits
2.3 Trining (no credits)	
3. Free Electives	3 credits

Detail of Curriculum

1. General Basic Courses — 46 credits

1.1 Humanities - 1 course — 2 credits

Select 1 course from the followings:

TU 111 TU 112 TU 113 TU 114 TU 115 TU 116 TU 117

1.2 Social Sciences - 3 courses — 9 credits

2 compulsory courses (6 credits) :

IE 201 IE 302

Select 1 course (3 credits) from the followings:

TU 121 TU 122 TU 123 TU 124 AC 201 BA 291 EC 210 EC 212

1.3 Languages - 2 courses — 6 credits

2 compulsory English courses:

EL 171 EL 172

1.4 Sciences and Mathematics -9 courses — 29 credits

9 compulsory courses:

MA 101 MA 102 MA 203 MA 204 MA 305 SC 124 SC 125 SC 133 SC 134

2. Engineering Courses — 101 credits

2.1 Core Courses — 27 credits

LE 121 IE 121 IE 158 IE 261 CE 102 CE 202 AE 211 ME 111 ME 112 ME 211 ME 241

2.2 Major Courses — 74 credits

2.2.1 Company Courses — 59 credits

LE 241 IE 222 IE 231 IE 263 IE 303 IE 311
IE 331 IE 332 IE 351 IE 352 IE 353 IE 354
IE 362 IE 364 IE 390 IE 412 IE 413 IE 433
IE 444 IE 492 IE 494 CE 221 ME 302

2.2.2 Elective Courses — 15 credits

Select from the followings:

Production

IE 434 IE 435 IE 436 IE 455 IE 456 IE 457
IE 496 ME 322 ME 391 ME 392 ME 415 ME 425

Management

IE 404 IE 414 IE 415 IE 416 IE 442 IE 443
IE 465 IE 466 IE 495 IE 496

2.3 Trining (no credits)

3. Free Electives — 3 credits

Free elective offered by Thammasat University.

Course Planning for Industrial Engineering Students

Fisrt Year

Course Number	Title	Credits
	Simester 1	
LE 121	Computer for Engineering	2(2-0-4)
CE 102	Introduction to Engineering	1(1-0-2)
ME 111	Engineerinr Drawing I	2(1-3-2)
MA 101	Mathematics I	3(3-0-6)
SC 124	Chemistry for Engineering I	4(3-3-6)
SC 133	Physical for Engineering I	4(3-3-6)
EL XXX	English Course x	3(5-0-4)
	Total	19(18-9-30)
	Simester 2	
IE 121	Material Science I	3(3-0-6)
IE 158	Engineering Tools & Operations	2(1-3-2)
ME 112	Engineering Drawing II	2(1-3-2)
MA 102	Mathematics II	3(3-0-6)
SC125	Chemistry for Egineers II	2(2-0-4)
SC 134	Physics for Engineers II	4(3-3-6)
EL xxx	English Course x	3(5-0-4)
	Total	19(18-9-30)

Second Year

Course Number	Title		Credits
	Simester 3		
IE 201	Material Science I		3(3-0-6)
IE 261	Engineerig Statistics		3(3-0-6)
LE 241	Introduction to Electrical Engineering		3(2-3-4)
CE 202	Engineering Mechanics I		3(3-0-6)
AE 211	Thermodynamics I		3(3-0-6)
MA 203	Mathematics III		3(3-0-6)
TU xxx	Social Sciences Electives		3(3-0-6)
		Total	21(20-3-40)
	Simester 4		
IE 222	Material Science II		3(2-3-4)
IE 263	Experimental Design		3(3-0-6)
CE 221	Mechanical of Solid I		3(3-0-6)
ME 221	Engineering Mechanics II		3(3-0-6)
ME 241	Mechanics of Fluids I		3(3-0-6)
MA 204	Mathematics IV		3(3-0-6)
MA 305	Numerical Methods		3(3-0-6)
		Total	21(20-3-40)

Third Year

Course Number	Title		Credits
	Simester 5		
IE 231	Industrial Safety		3(3-0-6)
IE 302	Engineering Economy		3(3-0-6)
IE 311	Work Study		3(2-3-4)
IE 351	Manufacturing Process & Technology I		3(2-3-4)
IE 362	Quality Control		3(3-0-6)
IE 364	Operation Research I		3(3-0-6)
IE 444	Environmental Control		3(3-0-6)
		Total	21(19-6-38)
	Simester 6		
IE 303	Industrial Cost Analysis & Budgeting		3(3-0-6)
IE 352	Manufacturing Process & Technology II		3(2-3-4)
IE 353	Automation		3(2-3-4)
IE 354	Basic Instrumentation		3(2-3-4)
IE 412	Production Planning & Control		3(3-0-6)
IE xxx	Technical Electives		3(3-0-6)
		Total	18(15-9-30)
IE 390	Industrial Training (Not less than 240 hours and two months)		0(0-0-0)

Fourth Year

Course Number	Title		Credits
	Simester 7		
IE 332	Value Engineering		3(3-0-6)
IE 413	Project Feasibility Study		3(3-0-6)
IE 433	Industrial Plant Design		3(2-3-4)
IE 492	Industrial Engineering Project I		1(0-3-0)
IE xxx	Technical Electives		3(3-0-6)
ME 302	Mechanical Engineering Laboratory I		2(0-4-2)
IE 331	Tool Engineering		3(2-3-4)
		Total	18(13-13-28)
	Simester 8		
IE 494	Industrial Engineering Project II		2(0-6-0)
IE xxx	Technical Electives		3(3-0-6)
IE xxx	Technical Electives		3(3-0-6)
TU xxx	Humanities Electives		2(2-0-4)
xx xxx	Free Electives		3(3-0-6)
		Total	13(11-6-22)

Description of Courses in Industrial Engineering
(Faculty of Engineering, Thammasat University)

IE 121 Material Science I 3(3-0-6)

Prerequisite :-

Properties and structure of materials : metals, alloys, ceramics and polymers. Studies of microstructures in relationship with mechanical properties of metallic materials. Phase equilibrium diagrams and their application. Effects of heat treatment on microstructure of alloys. Fracture, corrosion, degradation and failure analysis.

IE 158 Engineering Tools & Operations 2(1-3-2)

Prerequistite :-

Basic engineering tools and measurement emphasizing proper application and safety. Students acquire skills in fitting, machine tools, welding, foundry and fabrication.

IE 201 Engineering Management 3(3-0-6)

Prerequisite :-

Basic concepts and theories of modern management, human behavior, and human relation in organization. Methods of increasing productivities. Industrial safety. Basic concepts of engineering economy, finance, marketing, and project management.

IE 222 Material Science II 3(2-3-4)

Prerequisite : IE 121

Production of iron and alloy steels. Case hardening of steels. Powder metallurgy. Tool steels. Heat treatment of tool steels. Stainless steels. Cast iron. Carbon steels. High and low alloy steels. Aluminum. Magnesium. Copper. Zinc. White iron Nickel. Phastic technology

IE 231 Industrial Safety 3(3-0-6)

Preequisite : -

Natures and prevention of hazards in industrial production. Principles of industrial environmental control. Safety laws. Principles of safety management. Planning for safety such as plant layout, machine guarding, and maintenance. Legal concepts relevant to the technical profession.

IE 261 Engineering Statistics 3(3-0-6)

Prerequisite :-

Probability theory and statistical distributions. Sampling theory. Estimation theory. Hypothesis testing. Nonparametric statistics. Regression and correlation. Analysis of variance. Engineering applications of statistics.

IE 263 Experimental Design 3(3-0-6)

Prerequisite : IE 261

Principles of experimental design, and its application to engineering problem. Data collection. Data analysis.

IE 302 Engineering Economy 3(3-0-6)

Prerequisite :-

Time value of money. Engineering project analysis using economic approaches. Depreciation. Evaluation of replacement alternatives. Decisions under risks and uncertainty.

IE 303 Industrial Cost Analysis & Budgeting 3(3-0-6)

Prerequisite : IE 302

Introduction to financial reports. Basic techniques of financial report analysis. Cost analysis for planning, control and decision making. Standard costing. Budgeting.

IE 311 Work Study 3(2-3-4)

Prerequisite : IE 261

Studies of material handling behavior. Movement of operation in the workplace. Process chart. Activity chart. Man-machine chart. Simo-chart. Micromotion study. Motion economics. Work sampling. Direct time study. Predetermination of time standard using rating factor and contingency allowances. Analysis of work for improving production methods. Wage payment. Incentive planning.

IE 331 Tool Engineering 3(2-3-4)

Prerequisite : IE 121, IE 158

Design of cutting tools. Material selection and dimensional tolerances. Design of jig and fixture for machine tool works and welding works. Design of tools for inspection and gaging. Press tools. Plastics blowing/injection processes and equipments. Die design and making. Mold design and making. Heat treatment of tool dies and mold.

IE 332 Value Engineering 3(3-0-6)

Prerequisite :-

Value engineering methods. Aplication of value engineering technique in product design; procurement and manufacturing to reduced costs without loss of quality.

IE 351 Manufacturing Process & Technology I 3(2-3-4)

Prerequisite :-

Material removal processes in machine tool engineering. Engineering measurement and metrology. Standards and accuracy of measurement. Interchangeability : limits, fits, tolerances and allowances. Welding : principles, processes, equipment and accessories, design, and inspection and precautions. Fabrication: tools, equipment and accessories, and techniques. Industrial and decorative finishings: anodizing and eletroplating.

IE 352 Manufacturing Process & Technology II 3(2-3-4)

Prerequisite : IE 351

Technology of forming processes. Rolling. Forging. Tube and wire drawing. Extrusion: equipments, materials, methods of estimating force, torque and pressure. Foundry : casting processes, mold, pattern and core, liquid metal, solidification of casting, casting design. Plastic forming. Die casting.

IE 353 Automation 3(2-3-4)

Prerequisite :-

Overview of various kinds of pneumatic instrument. APT III programming.

IE 354 Basic Instrumentation 3(2-3-4)

Prerequisite :-

Concepts and definition of process measurement and control. Temperature measurement. Pressure measurement. Flow measurement. Level measurement. Analytical measurement such as ion concentration and pH. Electromagnetic radiation measurement. Standard symbols for process instrumentation drafting. Electronic controller. Pneumatic controller. Control valve. Use of instrument manual. Maintenance procedure.

IE 358 Manufacturing Processes 3(3-0-6)

(for mechanical engineering students)

Classification of manufacturing processes and technologies : machine tools, foundry, welding, forming processes. Equipments and accessories. Material selection. Engineering measurement and metrology. Inspection. Standard and accuracy of measurement.

IE 362 Quality Control Jiranat Sukanaji. 3(3-0-6)

Prerequisite : IE 261

Quality control techniques. Engineering reliability for quality control. Quality control management. Motivation and human relation for quality improvement. Quality control circles. Zero-defects program for quality improvement.

IE 364 Operations Research I Parichat, Jiranat. 3(3-0-6)

Prerequisite : IE 261 or permission from instructor.

Introduction to operations research techniques. Linear programming. Transportation problems. Assignment problems. Queuing theory. Simulation. Game theory.

IE 390 Industrial Training 0(0-0-0)

Prerequisite : Junior standing or permission from instructor.

Practical training in industry not less than 180 hours during summer vacation of the third year. Students must submit report to his/her advisor who will decide for the final grade (satisfactory (S) or unsatisfactory (U)).

IE 404 System Engineering 3(2-3-4)

Prerequisite : MA 204, IE 201

Introduction to the basic concepts of system engineering. System engineering approaches in planning, organizing and managing. System analysis and modelling.

IE 412 Production Planning and Control Nanis. 3(3-0-6)

Prerequisite : IE 261, IE 364 or permission from instructor.

Characteristics of production processes. Techniques of demand forcasting with an emphasis on statistical methods. Studies of controlling and managing major factors in production processes to lower production costs and idle time. Pert and CPM analysis.

IE 413 Project Feasibility Study 3(3-0-6)

Prerequisite : IE 302, IE 303

Basic concepts of project feasibility study. Markiting study. Engineering study. Management study. Financial study and other effects. Case studies are also discussed.

IE 414 Computer Simulation 3(3-0-6)

Prerequisite : IE 261 or permission from instructor.

Random number generation. Tests on random number. Data analysis. Simulation using GPSS, FORTRAN etc. Applications of simulation in queuing systems and industrial problems.

IE 415 Management Information Systems 3(3-0-6)

Prerequisite : IE 121

Introduction to management information systems concepts and structure. Developing and planning systems analysis and design. Systems testing. Implementation and maintenance.

IE 416 Maintenance Management 3(3-0-6)

Prerequisite :-

Maintenance concepts. Torotechnology. Preventive maintenance. Corrective maintenance. Planning and control of maintenance activites. Materials and spare part management. Reliability and failure statistics. Application of waiting line theory to maintenance problems. Critical path scheduling. Measurement and evaluation of maintenance performance.

IE 433 Industrial Plant Design 3(2-3-4)

Prerequisite :-

Facilities planning and design. Information and man-machine requirement analysis. Location analysis. Materials handling analysis. Storage and warehousing. Design economics. Line balancing and physical distribution.

IE 434 Computer Aided Manufactering 3(3-0-6)

Prerequisite : Senior standing.

Machine and mechanical hardware. Part programming. Algorithms for interpolation and control. Digital control. Industrial robots. Flexible manufacturing system.

IE 435 Nondestructive Testing 3(3-0-6)

Prerequisite : Senior standing

Concepts, objectives, types, and applications of nondestructive testing. Types and dangers of defects and fracture. Inspection techniques and applications.

IE 436 Failure Analysis 3(3-0-6)

Prerequisite : Senior standing.

Techniques, methods, and sequence of failure analysis. Material behavior under different types of mechanical loads under various circumstances. Temperature effects. Pressure effects. Causes, results and direction of failure. Physical and mechanical properties of mechanical design that affect the failure. Types of corrosion.

IE 442 Ergonomics 3(3-6-0)

Prerequisite :-

Introduction to ergonomics. Human body as a working system: bones, joints, muscles, metabolism, nervous system. Body measurement. Working environment including temperature, humidity, noise, visual perception, and vibrations. Equipment design:seating, controls, displays. Human factors in inspection, ages, shift work, motivation, and fatiques.

IE 443 Industrial Hygiene

Prerequisite :-

Studies of general industrial hygiene principles. Toxicology. Environmental risk factors on workers' health and prevention. protective clothing and equipment

IE 444 Environmental Control 3(3-0-6)

Prerequisite :-

Studies of pollution from industries: air pollution, wastewater, noise pollution. Emphasis on sources and effects. Engineering design for pollution control and protection.

IE 455 Welding Engineering 3(3-0-6)

Prerequisite : IE 351, IE 352

Welding processes and their application. Welding metallurgy. Welds and their characteristics. Defects and inspection. Welding control through design under influence of mechanical loads. Stress and strain. Shrinkage and distortion. Weld design for various types of work.

IE 456 Foundry Engineering 3(3-0-6)

Prerequisite : IE 351, IE 352

Metal casting processes. Thermodynamics of foundry work. Solidification of liquid metal in casting. Control for sand casting. Iron and steel making. Alloy steel casting. Foundry plant.

IE 457 Principles of Metal Cutting 3(3-0-6)

Prerequisite : IE 351, IE 352

Analysis of metal cutting. Mechanism of chip formation. Mechanics of metal cutting. Experimental and theoretical determination of cutting forces. Dynamometry. Thermal aspects of metal cutting. Tool materials. Tool wear. Tool life. Machinability. Mechanics of grinding surface quality and dimansions control. Economics of machining.

IE 465 Advanced Quality Control 3(3-0-6)

Prerequisite : IE 362

Studies of interesting topics and applications of quality control.

IE 466 Operations Research II 3(3-0-6)

Prerequisite : IE 364

Dynamic programming. Markov analysis. Decision theory. Nonlinear programming.

IE 492 Industrial Engineering Project I 1(0-0-3)

Prerequisite :-

Students carry out industrial engineering projects of interests, either individually or by group. A presentation is required.

IE 494 Industrial Engineering Project II 2(0-0-6)

Prerequisite : IE 492

Continuation of industrial engineering project from IE 492 to the final stage and a presentation.

ME 392 Mechanic Design 3(3-0-6)

Prerequisite : CE 221, IE 121

Metallurgical and mechanical properties of engineering materials. Analysis of stress, strain and deflection. Theory of failure of materials. Design of machine lelements such as shafts, keys, splines, couplings. Lubrication. Roller bearing and journal bearing. Gear trains, clutch, brake, belt, chain, spring, power screws. Bolted joints and riveted joints, Welding joints.

ME 415 Plant Engineering 3(3-0-6)

Prerequisite : Senior standing.

Plant location and layout. Design, installation, control and maintennce ofvarious systems such as elecrical system, hot water system, chilled water system, steam system, compressed air and gas systems, fire protection system.

ME 425 Automatic Control System 3(3-0-6)

Prerequisite : ME 324

Introduction to control systems. Basic system components. Linear systems and feedbacks. Mathematical modelling of systems. Response solutions and response characteristics of ystem. Transient behavior and performance criteria. Stability of sytems Error coefficients and error criteria. Analysis of linear control system by the root-locus and the frequency-response methods. Basic control actions. Improving system performance using compensation techniques. Introduction to the state variable method of analysis.

course of Industrial Engineering
First Year Semester 1

Course no.	Title	Credits	Time	Lecturer
LE 121	Computer for Engineering	2(2-0-4)	W,F 15.00-16.00	
ME 111	Engineering Drawing I	2(1-3-2)	M 13.30-14.30 - M 9.00-12.00 - M 15.00-18.00 - Sa 9.00-12.00	
MA 101	Mathematics I	3(3-0-6)	Tu,Th 11.00-12.30	
SC 124	Chemistry for Engineering I	4(3-3-6)	W,F 11.00-12.30 - Tu 13.30-16.30 - Th 13.30-16.30	
SC 133	Physics for Engineering I	4(3-3-6)	W,F 13.30-15.00 - Tu 13.30-16.30 - Th 13.30-16.30	
EL xxx	English Course X	3(5-0-4)	Tu,W,Th,F 9.30-11.00	

course of Industrial Engineering
First Year Semester 2

Course no.	Title	Credits	Time	Lecturer
CE 102	Introduction to Engineering	1(1-0-2)	Tu,Th 13.30-14.30	
IE 121	Material Science I	3(3-0-6)	W 15.00-18.00	Dr. K. Songhkao* J. Kloypayan
IE 158	Engineering Tool & Operation	2(1-3-2)	Tu 10.00-11.00 - Tu 13.30-16.30 - Th 13.30-16.30 - F 15.00-18.00 - Sa 9.00-12.00	S. Chuaksitsak S. Pararach
ME 112	Engineering Drawing II	2(1-3-2)	M 15.00-16.00 - M 8.00-11.00 - M 12.00-15.00 - M 16.00-19.00	
MA 102	Mathematics II	3(3-0-6)	W,F 13.30-15.00	
SC 125	Chemistry for Engineering II	4(3-3-6)	Tu,Th 9.30-11.00	
SC 134	Physics for Engineering II	4(3-3-6)	W,F 9.30-11.00 - Tu 13.30-16.30 - Th 13.30-16.30	
EL xxx	English Course X	3(5-0-4)	Tu,W,Th,F 11.00-12.30	

* = Part-time Lecturer

course of Industrial Engineering
Second Year Semester 1

Course no.	Title	Credits	Time	Lecturer
IE 201	Engineering Management	3(3-0-6)	SA 14.00-16.30	B.Cheewatragoongit *
IE 261	Engineering Statistics	3(3-0-6)	M 13.30-16.30	J. Suranowarath
LE 241	Introduction to Electical Engineering	3(2-3-4)	W 15.00-16.30 - F 9.30-12.30	
CE 202	Engineering Mechanics I	3(3-0-6)	M,W 9.30-11.00	
AE 211	Thermodynamics I	3(3-0-6)	M,W 11.00-12.30	
MA 203	Mathematics III	3(3-0-6)	Tu,Th 9.30-11.00	
TU xxx	Social Science Elective	3(3-0-6)		

course of Industrial Engineering
Second Year Semester 2

Course no.	Title	Credits	Time	Lecturer
IE 122	Material Science II	3(3-0-6)	M 10.30-12.30 - M 13.30-16.30	M. Nagswasdi J. Kloypayan
IE 263	Experimental Design	3(3-0-6)	W,F 11.00-12.30	J. Suranowarath
CE 221	Mechanic of Solid I	3(3-0-6)	M 9.00-10.30 Th 11.00-12.30	
ME 221	Engineering Mechanics II	3(3-0-6)	W 13.30-16.30	
ME 241	Mechanics of Fluid I	3(3-0-6)	Sa 9.30-12.30	
MA 204	Mathematics IV	3(3-0-6)	Tu,Th 9.30-11.00	
MA 305	Numerical Methods	3(3-0-6)	W,F 9.30-11.00	

* = Part-time Lecturer

course of Industrial Engineering
Third Year Semester 1

Course no.	Title	Credits	Time	Lecturer
IE 231	Industrial Safty	3(3-0-6)	W 13.31-16.30	W. Simachokdee*
IE 302	Engineering Economy	3(3-0-6)	M 9.30-12.30	P. Baisak
IE 311	Work Study	3(2-3-4)	Th 10.30-12.30 - Th 13.30-16.30	J. Kloypayan
IE 351	Manufacturing Process & Technology I	3(2-3-4)	F 10.30-12.30 - F 13.30-16.30	S. Pararach W.
IE 362	Quality Control	3(3-0-6)	Tu,Th 9.00-10.30	J. Teeravaraprug
IE 444	Environmental Control	3(3-0-6)	M 13.30-16.30	J. Ratanaphaithun*
IE 364	Operation Research I	3(3-0-6)	W 9.30-11.00 F 9.00-10.30	

course of Industrial Engineering
Third Year Semester 2

Course no.	Title	Credits	Time	Lecturer
IE 303	Industrial Cost Analysis & Budgeting	3(3-0-6)	Tu,Th 11.00-12.30	J. Teeravaraprug S. Tantaseraneewat
IE 352	Manufacturing Process & Technology II	3(2-3-4)	F 10.00-12.00 - F 13.00-16.00	S. Chuakittisak S. Pararach S. Sritongchai*
IE 353	Automation	3(2-3-4)	W 10.00-12.00 - W 13.00-16.00	S. Tamkittikon* J. Iinm*
IE 354	Basic Instumentation	3(2-3-4)	M 10.00-12.00 - M 13.00-16.00	P. Bonpamng*
IE 412	Production Planning & control	3(3-0-6)	Tu,Th 9.30-11.00	P. Baisak
IE 416	Maintenance Management	3(3-0-6)	Sa 13.00-16.00	W. Irisuwannatash*

* = Part-time Lecturer

course of Industrial Engineering
Fourth Year Semester 1

Couse no.	Title	Credits	Time	Lecturer
IE 413	Project Fesibility Study	3(3-0-6)	Su 9.00-12.00	Chowalitchewinkul*
IE 433	Industrial Plant Design	3(2-3-4)	Tu 13.30-16.30 - Tu 16.30-19.30	B. Thampitakkul*
IE 331	Tool Engineering	3(2-3-4)	M 9.00-11.00	C. Srigarmpong* A. sutasutakul* N. kumarnuwong*
IE 332	Value Engineering	3(3-0-6)	Tu,Th 11.00-12.30	S. Tantaseraneewat
IE 492	Industrial Engineering Project I	1(0-0-3)	M.Th 16.30-18.00	
ME 302	Mechanical Engineering Laboratory	2(0-4-2)	W 13.30-17.00	

course of Industrial Engineering
Fourth Year Semester 2

Course no.	Title	Credits	Time	Lecturer
IE 414	Computer Simulation	3(3-0-6)	Tu,Th 11.00-12.30	Nalis Charoenpom
IE 435	Nondestructive Testing	3(3-0-6)	M 13.00-16.00	Watchira Meetong*
IE 457	Principle of Metal Cutting	3(3-0-6)	M 9.00-12.00	Apinai sutasutakul*
IE 494	Industrial Engineering Project II	3(3-0-6)		
IE 496	Special Topic in Industrial Engineering	3(3-0-6)	F 13.00-16.00	Witul Simachokdee*

* = Part-time Lecturer

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 414 Computer Simulation

AIM OF THE MODULE : Random number generation. Tests on random number. Data analysis. Simulation using GPSS, FORTRAN etc. Applications of simulation in queuing systems and industrial problems.

ASSESSMENT :

Final test	50%
Homework	10%
Project	40% (Working in factory)

MODULE TEXT :

Discrete - event System Simulation , Jerry Banks and John S. Green, Prentice Hall.

MODULE TUTOR :

Naris Charoenporn

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : ME112 Engineering Drawing II

AIM OF THE MODULE : Basic descriptive geometry. Engineering drawing in some specific fields. Assembly and detailed drawing. Welding drawing.

ASSESSMENT :

To be arranged

MODULE TEXT :

Engineering Drawing 04, KMIT-North BKK

MODULE TUTOR :

Mr.Somsak Chuakittisak
Mrs.Wanee Ketkinta

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 121 Material Science I

AIM OF THE MODULE : Properties and structure of materials: metals, alloys, ceramics and polymers. Studies of microstructures in relationship with mechanical properties of metallic materials. Phase equilibrium diagrams and their application. Effects of heat treatment on microstructure of alloys. Fracture, corrosion, degradation and failure analysis.

ASSESSMENT :

Final test	55%
Midterm	45%

MODULE TEXT :

1. Introduction to Material Science for Engineer, James F. Shackelford, Macmillion Publishing Company.
2. Material for Engineering, L. H. Vanvlack, Addison - Wesly Publishing Company

MODULE TUTOR :

Kaew Songkeaw
Jirawan Kloypayan

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module :IE 158 Engineering Tools & Operation

AIM OF THE MODULE : Basic engineering tools and measurement emphasizing proper application and safety. Students acquire skills in fitting, machine tools, welding, foundry and fabrication.

ASSESSMENT :

Final test	20%
Midterm	50%
Practical Projects	30%

MODULE APPARATUS :

Consists of all conventional machine

1. Oxy-Acetylene welding equipment
2. Oxy-Acetylene cutting equipment
3. Shielded metal arc welding equipment
4. Mig welding equipment
5. Tig welding equipment
6. Air plasma cutting equipment
7. Shear and bending machine

MODULE TEXT :

Festo Didactic.

MODULE TUTOR :

- Mr.Somsak Chuakittisak
- Mr.Sawat Pararach

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 222 Material Science II

AIM OF THE MODULE : Production of iron and alloy steels. Case hardening of steels. Power metallurgy. Tool steels. Heat treatment of tool steels. Stainless steels. Cast iron. Carbon steels. High and low alloy steels. Aluminum. Magnesium. Copper. Zinc. White iron. Nickle. Plastic technology.

ASSESSMENT :

Final test	40%
Midterm	30%
Labaratory	20%
Homework	10%

MODULE OF APPARATUS

1. Mounting Press
2. Grinding Machine
3. polishing Macine
4. Metallurgical Microscope
5. Universal Testing Machine
6. Impact Strength Machine
7. Hardness Testing Machine
8. Microhardness Testing Machine
9. Spectro Analyser
10. Heat Treatment Furnace

MODULE TEXT :

1. Introduction to Material Science for Engineer, James F. Shackelford, Macmillion Publishing Company.
2. Material for Engineering, L. H. Vanvlack, Addison - Wesly Publishing Company.
3. Material Science and Engineering : An Introduction, 2nd Ed, Callister, W.D. , John Wiley &Sons,1991.
4. Engineering Material & Their Application,4th Ed, Flinn,R. A., Trojan, P.K., Houghton Miffin 1990.
5. The Nature and Properties of Engineering Materials, 3rd Ed, Jastrzebski, Z.D. , John Wille & Sons ,1987.

MODULE TUTOR :

- Montalee Nagswasdi
- Jirawan Kloypayan

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 261 Engineering Statistic

AIM OF THE MODULE : Probability theory and statistical distributions. Sampling theory. Estimatation theory. Hypothesis testing. Nonparametric statistics. Regression and correlation. Analysis of varience. Engineering application of statistics.

ASSESSMENT :

Final test	50%
Homework	10%
Project	40% (Working in factory)

MODULE TEXT :

Probability and Statistic for Engineering and Sciences, Jay L. Devore, Thomson International

Engineering Statistic , Sirichan Thongprasert et. al., Chulalongkorn University.

MODULE TUTOR :

- Janya Suranowarath

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 263 Experimental Design

AIM OF THE MODULE : Principles of experimental design, and its application to engineering problem. Data collection. Data analysis.

ASSESSMENT :

Final test	40%
Midterm	30 %
Homework	10%
Project	20%

MODULE TEXT :

Design and Analysis of Experiments, Douglas C. Montgomery.

MODULE TUTOR :

Janya Suranowarath

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 302 Engineering Economy

AIM OF THE MODULE : Time value of money. Engineering project analysis using economic approaches. Depreciation. Evaluation of replacement alternatives. Decisions under risks and uncertainty.

ASSESSMENT :

Final test	50%
Midterm	35%
Term paper	
Homework	15%

MODULE TEXT :

Engineering Economy. 3 rd Ed. Blank & Tarquin.

MODULE TUTOR : Parichat Baisak

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 303 Industrial Cost Analysis & Budgeting

AIM OF THE MODULE : Introduction to financial reports. Basic techniques of financial report analysis. Cost analysis for planning, control and decision making. Standard costing. Budgeting.

ASSESSMENT :

Final test	60%
Midterm	30%
Homework	10%

MODULE TEXT :

1. Cost and Budgeting Analysis , McGraw Hill
2. Cost Accouting I , Ramkumhang University.
3. Principal of Cost Accounting, Kasetsart University.
4. Costing : An Instructional Manual., T. Lucey, D.P. Publications.

MODULE TUTOR :

- Jirarat Theerawarapruk
- Samerjit Tantaserancewat

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 311 Work Study

AIM OF THE MODULE : Studies of material handling behavior. Movement of operation in the workplace. Process chart. Activity chart. Man-machine chart. Simo-chart. Micromotion study. motion economics. Work sampling. Direct time study. Predetermination of time standard using rating factor and contingency allowances. Analysis of work for improving production methods. Wage payment. Incentive planning.

ASSESSMENT :

Final test	40%
Midterm	40%
Project	20%

MODULE TEXT :

Introduction to Work Study , Vijit Tantasut et.al., Chulalongkorn University.

MODULE TUTOR :

Jirawan Kloypayan

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 332 Value Engineering

AIM OF THE MODULE : Value engineering methods. Application of value engineering technique in product design; procument and manufacturing to reduced costs without loss of quality .

ASSESSMENT :

To be arranged

MODULE TEXT :

To be arranged

MODULE TUTOR :

Samerjit Tantascraneewat

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 352 Manufacturing process & Technology II

AIM OF THE MODULE : Technology of forming processes. Rolling. Forging. Tube and wire drawing. Extrusion: equipments, materials, methods of estimating force, torque and pressure. Foundry: casting processes, mold, pattern and core, liquid metal, solidification of casting, casting design. Plastic forming. Die casting.

ASSESSMENT :

Final test	30%
Midterm	40%
Practical Project	30%

MODULE TEXT : Manufacturing Process, B.H Amstead
Machine Tool Desigh, Roloff & Mathek

MODULE TUTOR :
Mr.Somsak chuakittisak

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 353 Automation

AIM OF THE MODULE : Overview of various kinds of pneumatic instrument. APT III programming.

ASSESSMENT :

Final test	50%
Midterm test	40%
Project	10%

MODULE APPARATUS :

1. Pneumatics
2. Electro-pneumatic
3. Hydrualic
4. Electro-hydrualic
5. Programmable logic controller

MODULE TEXT :

To be arranged

MODULE TUTOR :

Mr.Sawat Pararach

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 362 Quality Control

AIM OF THE MODULE : Quality control techniques. Engineering reliability for quality control. Quality management. Motivation and human relation for quality improvement. Quality control circles. Zero defects program for quality improvement.

ASSESSMENT :

Final test	50%
Midterm	40%
Homework	10%

MODULE TEXT :

Modern Quality Control & Improvement, Prentice Hall.

MODULE TUTOR :

Jirarat Theerawarapruk

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : IE 414 Computer Simulation

AIM OF THE MODULE : Random number generation. Tests on random number. Data analysis. Simulation using GPSS, FORTRAN etc. Applications of simulation in queuing systems and industrial problems.

ASSESSMENT :

Final test	50%
Homework	10%
Project	40% (Working in factory)

MODULE TEXT :

Discrete - event System Simulation , Jerry Banks and John S. Green, Prentice Hall.

MODULE TUTOR :

Naris Charoenporn

THAMMASAT UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Session 1993-1994

Module : ME112 Engineering Drawing II

AIM OF THE MODULE : Basic descriptive geometry. Engineering drawing in some specific fields. Assembly and detailed drawing. Welding drawing.

ASSESSMENT :

To be arranged

MODULE TEXT :

Engineering Drawing 04, KMIT-North BKK

MODULE TUTOR :

Mr.Somsak Chuakittisak
Mrs.Wance Ketkinta

Projects of Senior Students
Department of Industrial Engineering
Session : 1993-1994

Project Name	Project Supervisor
1. Database for the Development of Prosthetic Lower Limbs	1. Mr. Naris Charoenporn 2. Miss Samerjit Tantasaraneewat 3. Mr. Taweesak Kijkanjanarat
2. Robotic Arms	1. Mr. Apinai Supasutakul * 2. Mr. Somsak Chuakittisak 3. Mr. Naris Charoenporn 4. Mr. Sawat Pararach 5. Miss Parichat Baisak
3. Feasibility Studies of Publish Transportation Problem with in TU.	1. Miss Parichat Baisak 2. Miss Samerjit Tantasaraneewat 3. Miss Jirarat Theerawarapruk
4. Testing Machine for Prosthetic Lower Limbs	1. Mr. Naris Charoenporn 2. Miss Samerjit Tantasaraneewat 3. Mr. Taweesak Kijkanjanarat
5. Cashew Crashing Machine	1. Mr. Apinai Supasutakul * 2. Mr. Somsak Chuakittisak 3. Mr. Naris Charoenporn 4. Miss Samerjit Tantasaraneewat
6. Semi-Automatic Tapping Machine	1. Mr. Apinai Supasutakul * 2. Mr. Somsak Chuakittisak 3. Miss Samerjit Tantasaraneewat 4. Miss Jirawan Kloypayan
7. Automatic Abrasive Shearing Machine	1. Mr. Apinai Supasutakul * 2. Mr. Somsak Chuakittisak 3. Miss Samerjit Tantasaraneewat 4. Miss Jirawan Kloypayan
8. ISO 9002	1. Miss Samerjit Tantasaraneewat 2. Mr. Anuwat Hormrossukon 3. Miss Jirarat Theerawarapruk 4. Miss Parichat Baisak
9. Dust Fillter for Grinding Machine	1. Mr. Somsak Chuakittisak * 2. Miss Samerjit Tantasaraneewat 3. Mr. Sawat Pararach
10. The Improvement of Manufacturing System Speaker Factory	1. Miss Parichat Baisak 2. Mr. Somsak Chuakittisak 3. Miss Montalee Nagswasdi 4. Miss Janya Suranowarath
11. MIS	1. Mr. Boonkiat Sheewatrakulkij * 2. Miss Parichat Baisak 3. Miss Jirarat Theerawarapruk

* part-time lecturers

Project Name	Project Supervisor
12. Feasibility Studies of Using AUTOCAD in Product Design	**1. Miss Parichat Baisak** 2. Mr. Naris Charoenporn 3. Miss Montalee Nagswasdi
13. Industrial Dry Dust Fillter System	**1. Mr. Jerasak Ratanapaitoon *** 2. Mr. Sawat Pararach 3. Mr. Naris Charoenporn

* part-time lecturers

Precision Engineering and Systems Automation
(CNC Laboratory)

460

1. General

In this Laboratory the special machine tools, CNC-Machine Tools such as NCN-Horizontal Machining Center, CNC Vertical Machining Center, CNC-Turning Center, CNC-EDM-Wire Cutting Machine, CNC-EDM-Sink Machine, CNC-Surface precision Grinder, FMS,CAD/CAM Workstation and industrial robots will be taught. Besides this they will be managed to the production system in form of automatic transportation in production line in order that the line of production can run continuously, in the system of flexible manufacturing. This Lab will also be provided for studies and research in case of decreasing any system errors, including the CAD/CAM workstation will be equipped.

2. Room

2.1 Room No. 105, Area 460 m^2
2.2 Air conditioned
2.3 Humidity and dust precaution
2.4 1 & 3 phase electricity supply

3. Type and Frequence of Use

3.1 IE 434 Computer Aided Manufactering	3(3-0-6)	= 45 hrs/Term
3.2 IE 351 Manufacturing Process & Technology I	3(2-3-4)	= 90 hrs/Term
3.3 IE 331 Tool Engineering (provided for making Die & Mould)	3(2-3-4)	= 90 hrs/Term
3.4 IE 457 Principles of Metal Cutting	3(3-0-6)	= 54 hrs/Term
3.5 Project seminar (Bachelor's)	3(0-3-0)	= 100 hrs/Term
3.6 Research and Thesis for Master & Post		= 200 hrs/Term
3.7 Specific courses & industrial Service		= 200 hrs/Term

CAD/CAM Laboratory

1. General

Methods in computer design, design practice, drawing figure etc. are taught in this Laboratory.

The CAD/CAM computer, a basic educational too for elevating educational content, will be provided for every student, including one unit for instructor use and one supplementary unit, for a total of 10 units.

2. Room

2.1 Room No. 606, Area 200 m^2
2.2 Air Conditioned
2.3 Humidity and dust prevention
2.4 1 & 3 phase electricity supply

3. Type and Frequence of Use.

3.1 IE 435 Computer Aided Manufacturing	3(3-0-6)	= 45 hrs/Term
3.2 IE 496 Computer Aided Design	3(3-0-6)	= 100 hrs/Term
3.3 Research and Study		= 150 hrs/Term
3.4 Seminar		= 150 hrs/Term
3.5 Projects seminar		= 150 hrs/Term

Precision Measuring Laboratory
(Metrology Laboratory)

1. General

The principle and operational skills in precision measuring instruments used in manufacturing by machine tools are taught in this Lab. Major equipment includes coordinate measuring machine, roundness tester, surface roughness tester, microscope, and conventional measuring instruments will be taught very intensively. Study and research some high tech measuring instruments such as a measuring network.

2. Room

2.1 Room No. 323, Area approx 100 m^2
2.2 Air conditioned
2.3 Humidity and dust prevention
2.4 1 & 3 phase electricity supply

3. Type and Frequence of Use

3.1 IE 351 Manufacturing Process & Technology I	3(2-3-4)	= 90 hrs/Term
3.2 IE 358 Manufacturing Process (for Mechanical Engineering.)	3(3-0-6)	= 50 hrs/Term
3.3 Project Seminar (Bachelor's)	3(0-3-0)	= 100 hrs/Term
3.4 IE 354 Basic Instrumentations	3(3-0-6)	= 50 hrs/Term
3.5 Research and Thesis for Master & Post		= 150 hrs/Term
3.6 Testing service and specific seminar		= 50 hrs/Term
3.7 Engineering Tool & Operation	2(1-3-2)	= 50 hrs/Term

Spectro Analyze

1. General

Use for study and analyze the variety at chemical elements which are the component of engineering material .

2. Room

2.1 Industrial Engineering Workshop, Room No.101 , Area 40 m^2
2.2 1 & 3 phase electricity supply
2.3 Air Conditioned
2.4 Humidity and Dust Prevention

3. Type and Frequence of Use.

3.1 IE 222 : Material Science II 3(2-3-4)	= 30 hrs/Term
3.2 IE 456 : Foundry Engineering 3(3-0-6)	= 30 hrs/Term
3.3 Seminar Project	= 50 hrs/Term
3.4 Research and Thesis of Master & Post	= 150 hrs/Term
3.5 Testing Service and Specific Saminar	= 50 hrs/Term

Sheet Metal

1. General

Use for study and pratice basic engineering tool for sheet metal work emphasizing application and safety. Students acquire skills in manufacturing process of sheet metal work such as cutting, rolling, seaming and forming.

2. Room

2.1 Industrial Engineering Workshop , Area 55 m^2

2.2 1 & 3 phase electricity supply

3. Type and Frequence of Use.

3.1 IE 158 : Engineering Tool and Operation	2(1-3-2)	= 60 hrs/Term
3.2 IE 352 Manufacturing Process & Technology II	3(2-3-4)	= 30 hrs/Term
3.3 Senior Project		= 100 hrs/Term
3.4 Research and Thesis of Master & Post		= 100 hrs/Term

Foundry Laboratory

1. General

Use for study and practice basic engineering tool for foundry emphasizing proper application and safety. Students acquire skills in manufacturing process of foundry, including making sand mold for foundry work.

2. Room

2.1 Industrial Engineering Workshop, Area 460 m^2
2.2 1 & 3 phase electricity supply
2.3 Ventilation

3. Type and Fruquence of Use.

3.1 IE 158 : Engineering Tool & Operation 2(1-3-2) = 60 hrs/Term
3.2 IE 352 Manufacturing Procen & Technology II 3(2-3-4) = 30 hrs/Term
3.3 IE 456 Foundry Engineering 3(3-0-6) = 60 hrs/Term
3.4 Senior Project = 100 hrs/Term
3.5 Research and Thesis of Master & Post = 100 hrs/Term

Welding Labolatory

1. Genearal

Use for study and practice basic engineering tools for welding emphasizing proper application and safety, study welding processes such as gas welding, electrical welding, MIG and TIG and their application

2. Room

2.1 Industrial Engineering Workshop, Area 150 m
2.2 1 & 3 phase electricity supply
2.3 Ventilation

3. Type and Frequence of Use

3.1 IE 158 : Engineering Tool & Operation	2(1-3-2)	= 60 hrs/Term
3.2 IE 455 : Welding Engineering	3(3-0-6)	= 60 hrs/Term
3.3 Senior Project		= 150 hrs/Term
3.4 Research and Thesis of Master & Post		= 150 hrs/Term

Machine Tools Laboratory

1. General

Use for study and practice basic engineering tools and measurement emphasizing proper application and safety. Students acquire skills in fitting, and Machine tools (lathes, dilling machine, milling machine and more)

2. Room

2.1 Industrial Engineering Workshop
2.2 1 & 3 phase electricity supply

3. Type and Frequence of Use

3.1 IE 158 Engineering Tools & Operations	2(1-3-2)	= 60 hrs/Term
3.2 IE 492, IE 494 Industrial Engineering Project I & II	3(0-9-0)	= 200 hrs/Term
3.4 Research and Thesis of Master & Post		= 200 hrs/Term

Sand Testing

1. General

Use for study the properties of sand which can be used suitable for foundry. These properties which are strength, premeability and deformation, including properties of sand mold and core.

2. Room

2.1 Industrial Engineering Workshop, Room No. 102, Area 50 m^2

2.2 1 & 3 phase electricity supply

2.3 Water supply

3. Type and Frequence of Use

3.1 IE 352 : Manufacturing Process & Technology II	3(2-3-4)	= 30 hrs/Term
3.2 IE 456 : Foundry Engineering	3(3-0-6)	= 30 hrs/Term
3.3 Senior Project		= 100 hrs/Term
3.4 Research and Thesis of Master & Post		= 100 hrs/Term
3.5 Testing Service		= 100 hrs/Term

Metallurgy

1. General

Use for study characteristic of micro structure of metallurgy. In the Laboratory have many microscopes. Some of them are which can take photograph of micro structure and then. These photograph can used for study and compare.

2. Room

2.1 Industrial Engineering Workshop, Room No. 202 , Area 60 m^2
2.2 1 phase electricle supply
2.3 Air Conditioned

3. Type and Frequence of Use

3.1 IE 121 : Material Science I 3(3-0-6)	= 15 hrs/Term
3.2 IE 222 : Material Science II 3(2-3-4)	= 45 hrs/Term
3.3 Senoir Project (Bachelor's) 3(0-9-0)	= 100 hrs/Term
3.4 Research and Thesis of Master & Post	= 200 hrs/Term
3.5 Specific Courses & Samina	= 100 hrs/Term
3.6 Testing Service	= 100 hrs/Term

Pneumatic, Hydraulic and Automation

1. General

Use for study and practice various kinds of system of pneumatic and hydraulic instrument. Included, use Automatic Control of these equipments.

2. Room

2.1 Room Number 201 , Area 50 m^2

3. Type and Frequence of Use

3.1 IE 353 : Automation 3(2-3-4)	= 50 hrs/Term
3.2 Senior Project (Bachelor's)	= 150 hrs/Term
3.3 Research and Thesis of Master & Post	= 150 hrs/Term
3.4 Specific Course & Industrial Service	= 150 hrs/Term

Nondestructive Testing

1. General

Use for study and test characteristics of materials which are types and dangers of defects and fracture.

2. Room

2.1 Industrial Engineering Workshop, Room No. 202, Area 50 m^2

2.2 Air Conditioned

3. Type and Frequence of Use

3.1 IE 121 : Material Science I	= 15 hrs/Term
3.2 IE 435 : Nondestructive Testing 3(3 0-6)	= 30 hrs/Term
3.3 Senior project (Bachelor's)	= 100 hrs/Term
3.4 Research and Thesis of Master & Post	= 150 hrs/Term

Destructive Testing

1. General

Use for study and test physical and mechanical properties of materials and study material behavior under different type of mechanical loads (such as compression, tension, torsion and more)

2. Room

2.1 Industrial Engineering Workshop, Room No. 203 , Area 50 m^2

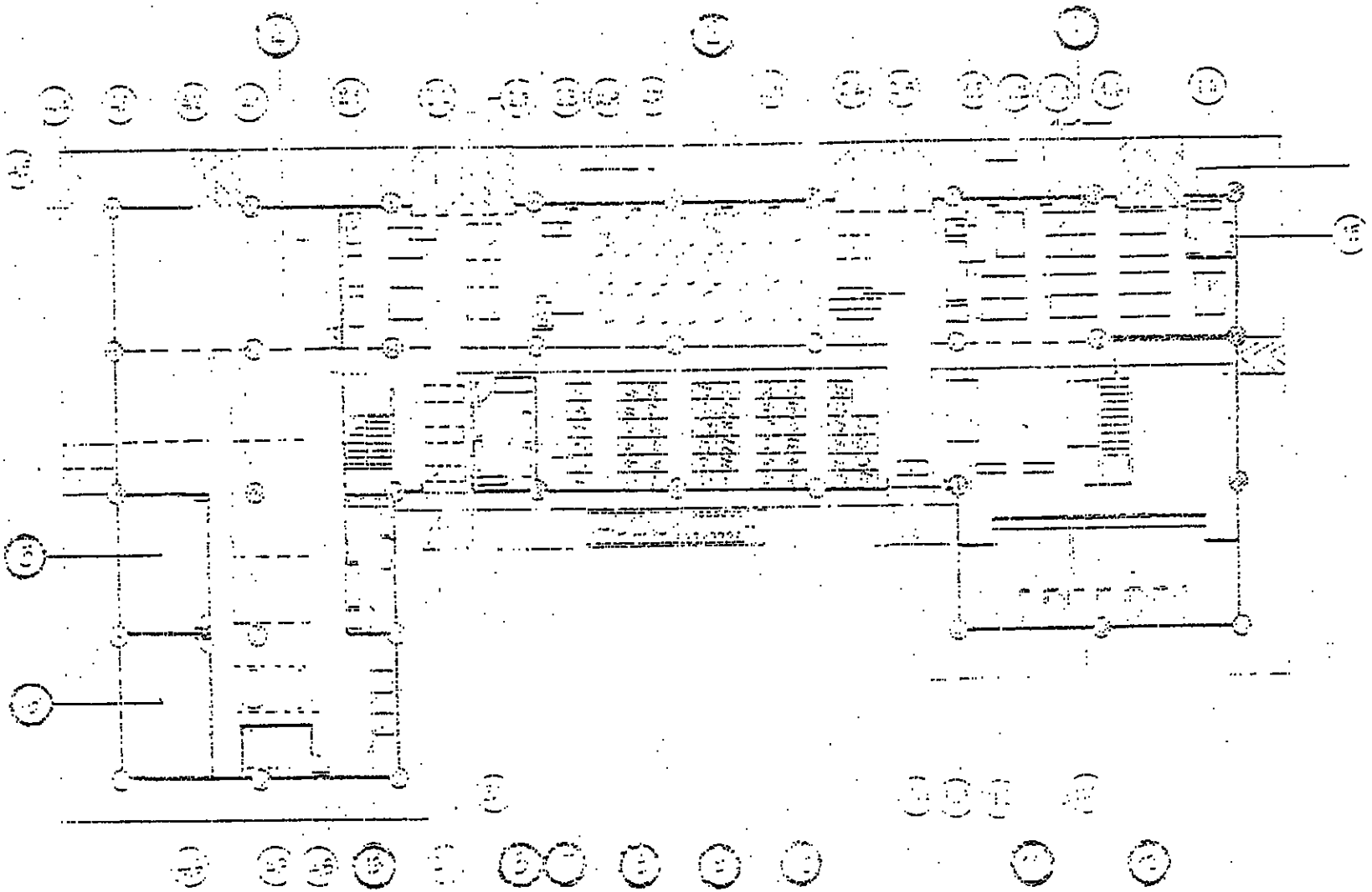
2.2 1 & 3 phases electricity supply

3. Type and Frequence of use

3.1 IE 121 : Material Science I 3(3-0-6)	= 15 hrs/Term
3.2 IE 222 : Material Science II 3(2-3-4)	= 30 hrs/Term
3.3 IE 436 : Failure Analysis 3(3-0-6)	= 30 hrs/Term
3.4 Senior Project (Bachelor's)	= 100 hrs/Term
3.5 Research and Thesis of Master & Post	= 200 hrs/Term
3.6 Specific Courses & Industrial Service	= 200 hrs/Term

The Details of Industrial Engineering Workshop Layout
(1st Floor)

No.	Description	Amount requiered	Amout existiog	Remarks
1.	Basic benchwork area			
	1.1 Work benches	25	25	
	1.2 Work bench for drilling	1	1	
	1.3 Drilling machines	2	2	
	1.4 Surface plates	2	2	
	1.5 Tool and equipments lockers	2	-	
	1.6 Tool grinder	2	2	
2.	Basic machining area			
	2.1 Tools and equipments lockers	4	-	
	2.2 Milling machines	3	2	
	2.3 Cutter grinding machine	1	-	
	2.4 Cylindrical grinding machine	1	1	
	2.5 Surface grinding machine	1	1	
	2.6 Shaping machine	3	-	
	2.7 Radian drilling machine	1	1	
	2.8 Hydraulic (hand-oper) press	1	1	
	2.9 Center lathes	25	13	
3.	Tool room			
	3.1 Locker (sliding glass window)	5	5	
4.	Foundry section			
	4.1 Sand moulding area			
	4.2 Sand			
	4.3 Sand mixer	2	2	
	4.4 Automatic sand moulding machine	2	-	
	4.5 Working area for foundry			
	4.6 Induction furnace	2	2	
	4.7 Induction temperature Control room	1	1	
	4.8 Electric furnaces	2	2	
5.	Sand testing laboratory	1	1	
6.	Element analysis laboratory	1	1	
7.	Electro-welding boother	25	25	
8.	Oilbins and defected tools	1	-	
9.	Oxy-Acetelene room	1	1	
10.	Gas welding boothes	25	25	
11.	Sheet metal area			
	11.1 J.Gilotin (electrical) shear	1	1	
	11.2 Folding machines (hand operate)	2	2	
	11.3 Folding machine (eletric operate)	1	1	
	11.4 Horizontal hand saw	1	1	
12.	Washing room			



Layout of Industrial Engineering Workshop
(1 st Floor)

The Details of Industrial Engineering Workshop Layout
(2 nd Floor)

No	Description	Amount required	Amount existing	Remarks
1.	**Pneumatic Hydraulics and Automation**			
	1.1 Basic Pneumatic Training Set	5	1	
	1.2 Advance Pneumatic Training Set	1	-	
	1.3 Hydraulic Training Set	5	-	
	1.4 Advance Hydraulic Traning Set	1	-	
	1.5 Personal Computer	1	-	
2.	**Metallurgy Laboratory**			
	2.1 Mounting Machine	3	2	
	2.2 Grinding Machine	4	4	
	2.3 Cutting Machine	2	1	
	2.4 Dryer	2	2	
	2.5 Polishing Maching	2	2	
	2.6 Microscope	4	2	
	2.7 Vedio system	2	1	
3	**Nondestructive Testing**			
	3.1 Eddy Current	1	1	
	3.2 Ultrasonic Testing	1	1	

Layout of Industrial Engineering Workshop
(2 nd Floor)

The Details of Precision Measuring Laboratory Layout

3 rd Floor : Room No. 323

No	Description	Amount requiered	Amount existing	Remarks
1.	Central Measuring Network Section			
	1.1 Personal Computer	3	-	
	1.2 Suface Plate	2	-	
	1.3 Digimatic Multi Unit	3	-	
	1.4 Digital Measuring Instrument	20 items	-	
2.	Precision Measuring Section			
	2.1 Surface Plate	2	-	
	2.2 Roundness	1	-	
	2.3 Personal Computer	1	-	
	2.4 Roughness	1	1	
	2.5 Profile Projector	1	1	
3.	Micrometer	16 items	-	
4.	Geages and Other Equipments	24 items	-	
5.	Lecture Room			
	3.1 Tables	8	8	
	3.2 Chairs	24	24	

Equipments Received from Thai Government

4.3 Equipments Recived from Thai Government

(Governmental Budget)

Year 1990

NO.	Quantity (Sets)	Description	Price (Bht)
1.	13	Lathe	1,950,000
2.	13	Electric Welding Equipment	241,000
3.	13	Gas Welding Equipment	219,000
4.	2	Electric Saw	19,400
5.	2	Electric Grinding Machine	14,300
6.	2	Electric Drilling Machines	26,600
7.	2	Wire Wrap	900
8.	2	Tab/screw Making Machines	5,000
9.	2	Box/Pan Brake	15,300
10.	2	Hand Drill	8,000
		Total	2,499,500

Equipments Recived from Thai Government

(Governmental Budget)

Year 1991

NO.	Quantity (Sets)	Description	Price (Bht)
1.	1	Universal Milling Machine	502,600
2.	1	Impact Testing	559,000
3.	1	Hardness Testing	831,300
4.	1	Vertical Drilling	418,100
5.	1	Grinding Machine	421,300
6.	1	Shaping Machine	204,000
7.	1	Hydraulic Press	33,150
8.	1	Universal Testing	843,600
9.	1	Box/Pan Brake (Large)	684,100
10.	1	Press Brake	668,100
		Total	5,166,150

Equipments Reciveed from Thai Government

(Governmental Budget)

Year 1992

NO.	Quantity (Sets)	Description	Price (Bht)
1.	26	Welding Lab Bench	238,700
2.	25	Technical Lab Bench	612,000
3.	13	Foundry Lab Bench	119,340
4.	1	Metallurgical Microscope	836,440
5.	1	Metallurgical Cutting Machine	255,000
6.	1	Metallurgical Grinding Machine	153,000
7.	1	Desiccator	4,896
8.	1	Vibro Engraver	1,632
9.	1	Small Oven	153,000
10.	1	Large Oven	178,500
11.	1	MIG Welding	163,200
12.	1	TIG Welding	153,000
13.	1	Pneumatic Training Set	1,020,000
14.	1	Ultrasonic Testing	815,490
15.	1	Welding Specimen	102,000
16.	1	Eddy Current	510,000
17.	1	Surface Roughness Measuring Instrument	408,000
18.	1	Gauge Blocks	158,916
19.	1	Profile Projector	765,000
Total			6,648,074

Equipments Recived from Thai Government

(Governmental Budget)

Year 1993

NO.	Quantity (Sets)	Description	Price (Bht)
1.	1	Machine Shop Equipment	122,400
2.	1	Metallurgical Mounting Machine	168,300
3.	2	Metallurgical Grinding Machine	183,600
4.	2	Metallurgical Polishing Machine	367,200
5.	2	Dryer	20,400
6.	1	Fume Extractor	11,220
7.	12	Gas Welding Set	201,960
8.	12	Electric Welding Set	379,440
9.	1	Spot Welding	96,900
10.	25	Hand Tool Equipment Set	61,200
11.	6	Electric Welding Bench with Chairs	45,900
12.	12	Lathe	3,672,000
13.	1	Cutting Tool Grinder	3,672
14.	1	Band Saw	56,100
		Foundry Shop Equipment	
15.	1	Induction Furnace	3,570,000
16.	25	Mold Making Equipment	102,000
17.	1	Sand Mixer	907,800
18.	1	Air Pump	360,000
19.	1	Sand Rammer	220,524
20.	1	Specimen Tube Funnel	2,856
21.	1	Sand Rammer Pedestal	22,338

(continued)

Year 1993

NO.	Quantity (Sets)	Description	Price (Bht)
22.	1	Density Indicator	13,770
23.	1	Compatability	3,443
24.	1	Electronic Balance	111,180
25.	1	Moisture Teller	214,200
26.	1	Electric Permmeter	214,200
27.	1	Mold Permeability Tester	12,240
28.	1	Universal Sand Strength Machine	895,560
29.	1	Sand Hardness Tester	76,500
30.	1	Sand Hardness Tester Accessories	25,500
31.	1	Mold Hardness Tester	21,420
32.	1	Green Hardness Tester	34,884
33.	1	Clay Measurement Tester	82,620
34.	1	Sieve Analysis Machine	52,020
35.	1	Sand Washing Machine	35,190
36.	1	Drying Oven	161,160
37.	1	Automatic Dryer	192,270
38.	1	Sand Sieve	30,600
39.	1	Dryer	90,780
40.	1	Volatiles Apparatus	9,180
41.	1	Combustibles Test	134,640
42.	1	Sand Testing Sieves	45,390
43.	1	Sieve Shaker	204,000

(Continued)

Year 1993

NO.	Quantity (Sets)	Description	Price (Bht)
44.	1	Vertical Milling Machine	510,000
45.	1	Drilling Machine	510,000
46.	1	Hydraulic Crane	306,000
Total			**14,562,557**

Equipments Expected from Thai Government

(Governmental Budget)

Year 1994

NO.	Quantity (Sets)	Description	Price (Bht)
1.	1	Flexible Manufacturing System (Demonstration Set)	3,500,000
2.	1	Conputerized Numerical Controlled Machine	3,500,000
3.	1	Equipment Set for Ergonomic Laboratory	3,000,000
4.	1	Precision Measuring Equipment	250,000
5.	1	Testing Mechine for Weding Parts (Tension and Bending)	160,000
6.	1	Hardness Testing	400,000
7.	1	Metallurgical Microscope	300,000
8.	2	Glasswares(to protection moisture for metallurgical specimems)	11,600
9.	1	Sewing Machine	15,000
10.	1	Oven	65,000
11.	2	Anvil (large size)	160,000
12.	1	Rolling Machine (Sheet Metal)	70,000
13.	1	Forming Machine (Sheet Metal)	110,000
14.	1	Forming Table (Sheet Metal)	60,000
15.	25	Hard Tool Equipment Set (Sheet Matel)	100,000
16.	1	Seam Meachine (Sheet Metal)	200,000
17.	10	Fixture (large size)	50,000
18.	1	Grid Knite Machine	360,000

(continued)

Year 1994

NO.	Quantity (Sets)	Description	Price (Bht)
19.	2	Hand Drill	18,000
20.	1	Metal Cutting Machine	17,000
		Total	12,346,600

Equipments Requested from Japanese Government

4.4.1 Equipments for CNC Laboratory

No	List of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
1.	CNC Vertical Machining Center	1) Automatic Tool change with 30 Tools 2) Traverse (minimum) X 600 mm. Y 400 mm. Z 400 mm. 3) Spindle Power ≥ 11 Kw 4) Controller with Latest Technological Features similar to Fanuc-15M 5) Simultanious 3-axes 6) Accessories: a) Work Holding Devices like Pneumatic vise modular fixture elements etc. b) Tool Holder and Cutting tools c) All standard accessories	1 Unit			1) Tool change system study 2) Big enough for cutting demonstration work piece (wider, longer but flat) 3) enough for rough cutting 4) follow the market of Fanuc-Controller which booming in Thailand a) High accuraracy positioning of the fixed work piece b) very neccessary c) included

No.	Item of Equipment	Specification	Amout Request	Unit Price (yen)	Total Price (yen)	Utility
2.	CNC-EDM-Wire Cutting	-Overal size : 1800x1000x1300 mm. (H x D x W) -wire dia. : 0.1-0.33 mm. -max. wire feed rate : 250 mm/sec. -CNC control System closed loop - Max workpiece dimensions W x D x H = 300 x 400 x 150 mm -Automatic second cut function -ability for cutting a different top and bottom shapes and different top and bottom radii -semi-automatic wire take up device -all standrad accessories.	1 unit			Studying, researching technology transfering of Wire Cutting technology should have been handing on the real and industrial size machine. Too small more diffcult to get the good quality of cutting the speciment (workpiece)

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
3.	CNC TURNING Center with Gantry (CNC TURN-MILL Center)	1) min 3- axes (X, Z, and "C") 2) with rotary tools e.g. 6-fixed; 6-rotary 3) chuck dia. ~250 mm. (hydralic operated) 4) Strokes Xmin 300 mm. Zmin~ 600 mm. 5) with tailstock 6) spindle moter ≥ 11 kW 7) slant bed construction 8) Turret preferably VDI-Type 9) Controller Fanuc Accessories: 1) CNC-Controlled stedy rest 2) Automatic Tool offset measurement with probes 3) Gantry Robot for Loading/unloading the work pieces 4) Tool holders and Cutting Tools 5. Bar feed system (if possible) 6) all standard accessories.	1 unit			1) Study of the principle of the latest axes control system. 2) To study the driving sytem of the rotary tools holder 3) appropriate size for 4) CNC machining center 5) To study how the automatic tailstock of machine can be controlled by programming 6) appropriate power 7)-9) very preferably machine feature in industries in Thailand. Accessories 1), 2), 3), 4) quit neccessary for sudy and research work. 5) standard acc. normally included.

4.4.2 Equipments for CAD/CAM Laboratory

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
1.	Computer Workstation	- 64 MB main memory - 1.44 MB Floppy Disk Drive - 1.05 GB Hard Disk - at least 19 inch color monitor - keyboard & mouse	2 units			These equipments will bevused for supporting CAD/CAM Laboratory which will upgrade the quality of engineering geaduates and enhance the research and development for CAD/CAM technology
2.	Personal Computer	- CPU is 486 intel - at least 50 MHz of speed - 16 MB Memory - 1.44 MB, 3.5 inch Floppy Disk Drive - at least 120 MB Hard Disk - 20 inch color monitor with super VGA card - keyboard & mouse	6 units			
3.	Plotter	- can use many colors and joint pencil together - A0 size	1 unit			
4.	Tape Drive	- 150 MB Cartidge Tape Drive	1 unit			
5.	CD Rom Drive	can be use to read software program from CD	1 unit			

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
6.	Network Equipment	Network Equipments are the equipments which can used connect total hardware is in CAD/CAM laboatory. They are consisted : - Ethernet Hub can be upto 15 ports - Ethernet Card for 10 units PC - Communication sofware between computer workstation and Personal Computer	1 set			

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
7.	CAD/CAM Software for Workstation	The CAD Software which the details are as follows : - can be used to creat engineering drawing using standard geometric, such as points, lines, curves, circles and more - Dimension and Text capacities is Internation Standards Organization (ISO), JIS ANSI, DIN or user defined satndards. - can creates 3 demension design, construct, deform and blend complex, sculptured of the system. - To create complex solids from wireframe, surface or solid elements which are associative foe detail drafting - To analize mass properties, interference and general quality of design and machinability and then can perform interference chacks between solids and/or polyhedral surfaces - The software has the function which users can interactively define many image parameters	1 set			

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
7.	CAD/CAM Software for Workstation (continued)	The CAM software which the detail are as follows : - can be used control the NC-Machine, (Lathe, Drilling, Milling, Machining Center, Wire Cut and EDM) define tool paths for various opertions such as strating-ending, rough cutting, grooving, threading and tool changing. - to simplify the machine tool programming process by simulating many operations. - to create NC-Programs directly from 2D and 3D which are created, in form of Automatically Programmed Tool (APT) source programs or Direct Cutting Location File (CLFILE) output - to visulize NC tool paths (on the Graphics screen) and simulated the movement of cutting tools - to provide the option to perform contouring, pocketing or surface machine in simple 2-axis or in complex 3- to 5-axis environments				

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
7.	CAD/CAM Software for Workstation (continued)	- This software can Interactively robots and robots cells by using a wireframe, surface or solid representation model and spacifying the appropriate joint types and their limits and then simulate the grasping or releasing of tools or objects. In the other, it can calculate static loads on joints and show that robot is strong enough for a specfic task - can create, modify and anslyze finite element models to evaluate a design - these datas are created by the software , can be transfered to IGES be standard data that other CAD/CAM system can use tthese data. Another wayis recieves the data of the others CAD/CAM. - to store a wide varity of components for both 2D and 3D application and more.				

No.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
8.	CAD/CAM Software for Personal Computer	CAD sofware has the specification are as the followimg - can use on PC which using intel 486 processor - to create engineering drawing using standard geometic (ISO, JIS, ANSI and more) and 3-dimension geometric models, to sculpt and shape models using NURB (Non Uniform Rational B-Spline) and Brizer surface, To verify and visualize designs using both faceted and smooth shading techniques and to dociment designs for manufacturing and assembly by generating high-quality engineering drawings. - can transfers and receives the data on DXF and IGES formats CAM software which the details are as follows: - to create tool path and NC program for CNC machine which is 2 1/2 axis and 3 axis, then simulates and show the working of cutting tools on the geometric desig - to create G-code which suitable for CNC controller is used - can transfers and receives the data on DXF and IGES formats and download completed part programs directly to CNC machines.	10 units	1,188,000	11,880,000	- To study for basic concept in creating the NC programming
9.	Laser Printer	- at least A3 size	1 unit			

4.4.3 Equipments for Precision Measuring Laboratory (Metrology Laboratory)

NO.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
1	Central Measuring Network. Consist of :					Many Company in Thailand has set the metrology laboratories and try to up-grade the measurment ethod The "Central Measuring Network" is one which would have been taught and transfered this measuring technology to the engineers and the related personel
	1.1 Digimatic Multi Unit	receives data from upto six digimatic guage and performs GO/NG judgments on the measurement data individually or collectively.	3 sets			
	1.2 Personal Computer	PC 486/50	3 sets			
	1.3 Digimatic Instrument		1 set			
	1.3.1 Toolmaker Microscope with Vdio Image Edge Sensor	Like Mitutoyo (TM301)	1 set			
	1.3.2 Digimatic Bench Micrometer	Measuring Range: 0-50 mm.	1 set			
	1.3.3 Digimatic Indicator with Stand	Measuring Range: 25 mm.	2 sets			
	1.3.4 Digimatic Depth Gauge	Measuring Range: 0-150 mm.	2 sets			
	1.3.5 Digimatic Depth Micrometer	Measuring Range: 0-150 mm.	2sets			
	1.3.6 Digimatic Holtest	Dia. 25 - Dia. 30 mm	1 set			
	1.3.7 Digimatic Height Gauge	with bidirectional touch signal probe Measuring Range: 0-300 mm.	1 set			
	1.3.8 Digimatic Caliper	Measuring Range 0-150 mm. 0-300 mm.	1 set 1 set			
	1.3.9 Laser Scan Micro Meter	Measuring Range 0.3-30 mm.	1 set			
	1.3.10 Digimatic Micrometer	Measuring Range 0-25 mm.	1 set			
	1.3.11 Digimatic Screw Micrometer	Measuring Range 0-25 (60 Deg.) mm. Measuring Range 0-25 (55 Deg.) mm.	1 set 1 set			

NO.	Item of Equipment	Specification	Amount Request	Unit Price (yen)	Total Price (yen)	Utility
	1.3.12 Digimatic Disc Micrometer	Measuring Range 0-25 mm.	1 set			
	1.3.13 Digimatic Gear Micrometer	Measuring Range 0-25 mm.	1 set			
	1.3.14 Digimatic Inside Micrometer	Measuring Range 25-50 mm.	1 set			
	1.3.15 Digimatic Height Master	Measuring Range 10-310 mm.	1 set			
		Total				

No.	Item of Equipment	Specification	Amount Reques	Unit Price (yen)	Total Price (yen)	Utility
2.	Roundness Tester	1.) incorporates powerful software with wide range of evaluation parameters 2.) roundness valuation notched workpiece measurement coaxiality and consentricity measurements. 3.) Automatic tilt compensation function electrically align the axis of turn table and workpiece 4.) Digital display of the Parameter Values 5.) Optical Sensor Unit 6.) max workpiece standrs 8.) Personal Computer is: - CPU is 486 intel - at least 50 MHz of speed - 8 MB Memory - 1.44 MB, 3.5 inch Floppy Disk Drive - at least 120 MB Hard Disk - 14 inch color monitor with super VGA card (at least 256 colors) - keyboard & mouse 10.) Dot Printer 36 pin	1 unit			
Total						

付属資料　4．電気工学科関連資料（カリキュラム）

Electrical Engineering Curriculum

Curriculum Outline	1991-1994 2533-2537 Credits	1995-1998 2538-2541 Credits
Total credit requirements	150	150
1. General Basic Courses	46	48
1.1 Humanities	2	3
1.2 Social Sciences	9	6
1.3 Languages	6	9
1.4 Sciences and Mathematics	29	27
2. Engineering Courses	101	99
2.1 Core Courses	27	24
2.2 Electrical Engineering Courses	74	75
2.2.1 Compulsory Courses	59	61
2.2.2 Elective Courses	15	14
3. Free Electives	3	3

Planning for

Electrical Engineering Curriculum

First Year

First Semester

Subject	Credits
Physics for Engineers I	4
Chemistry for Engineers	4
Engineering Drawing I	2
Calculus I	3
Mathematics	3
English Course x	3
Thai Usage	3
Introduction to Engineering	0
	22

Second Semester

Subject	Credits
Physics for Engineers II	4
Calculus II	3
Material Science I	3
Engineering Tools & Operations	2
Engineering Drawing II	2
Computer Programming	3
English Course x	3
	20

Second Year

Third Semester

Subject	Credits
Engineering Economy	3
Calculus III	3
Engineering Mechanics I	3
Thermodynamics I	3
Probability & Statistics for Engineers	3
Electrical Circuit Analysis	3
Data Structures	3
	21

Fourth Semester

Subject	Credits
Humanities Electives	3
Electrical Circuit Analysis Lab	1
Mumerical Methods	3
Engineering Mechanics II	3
Network Theory	3
Electromechanical Energy Conversion I	3
Electronic Circuits & Devices	3
Electrical Engineering Mathematics	3
	22

Third Year

Fifth Semester

Subject	Credits
Engineering Management	3
Electronic Circuits & Devices Lab	1
Electromechanical Energy Conversion Lab I	1
Electromechanical Energy Conversion II	3
Signals and Systems	3
Electromagnetics Theory	3
Digital Electronics	3
Physical Electronics	3
	20

Sixth Semester

Subject	Credits
Electromechanical Energy Conversion Lab II	1
Digital Electronics Lab	1
Electrical Measurement and Instrumentations	3
Electrical System Design	3
Microprocessors	3
Feedback Control Systems	3
Principles of Communications	3
Power Systems	3
	20

Summer Semester

Industrial Training	0
(Not less than 240 hrs.)	

Fourth Year

Seventh Semester

Subject	Credits
Communication System Lab	1
Instrumentation and Control Systems Lab	1
Electrical Electice Courses	7
Free Electives	3
	12

Eighth Semester

Subject	Credits
Electrical Engineering Project	3
Electrical Elective Courses	7
	10

付属資料５．機械工学科関連資料

① 教材として予定される図書

② シラバス概要

③ カリキュラムの概要

④ 実験・実習の要領

① 教材として予定される図書

(1) Threlkeld, J. L., "Thermal Environmental Engineering", Second Edition, Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1970

(2) Dossat, R. J., "Principles of Refrigeration", Second Edition, SI Version, John Wiley & Sons Inc., New York, 1981

(3) ASHRAE Handbook - 1981 Fundamentals Volume, American Society of Heating, Refrigerating and Air Conditioning Engineers Inc., New York

(4) ASHRAE Handbook - 1983 Equipment Volume, American Society of Heating, Refrigerating and Air Conditioning Engineers Inc., New York

(5) Carrier Air Conditioning Company, "Handbook of Air Conditioning System Design", McGraw-Hill Book Company, New York, 1965

(6) Gosney, W. B., "Principles of Refrigeration", Cambridge University Press, 1982

(7) Stoecker, W. F., "Refrigeration and Air Conditioning", McGraw-Hill Book Company, New York, 1958

(8) Elonka, S. M. and Minich, Q. W., "Standard Refrigeration and Air Conditioning Questions and Answers", Second Edition, McGraw-Hill Book Company, New York, 1973

(9) Carrier, W. H., et al., "Modern Air Conditioning Heating and Ventilating", Third Edition, Pitman Publishing Corporation, New York, 1958

(10) Gunther, R. C., "Refrigeration Air Conditioning and Cold Storage", Chilton Book Company, New York, 1969

② シラバス概要

Description of Courses in Mechanical Engineering

ME 111 Engineering Drawing I **2 (1-3-2)**

Prerequisite : -

The significance of drawing. Instruments and their uses. Lining and lettering. Work preparation. Applied geometry. Dimensioning and description. Orthographic projection. Pictorial drawing. Freehand sketching. Sectioning. Allowance and tolorance. Computer aided drawing.

ME 112 Engineering Drawing II **2 (1-3-2)**

Prerequisite : ME 111

Basic descriptive geometry. Engineering drawing in some specific fields. Assembly and detailed drawing. Welding drawing.

ME 201 Basic Mechanical Engineering Laboratory **1 (0-3-0)**

Prerequisite : -

Measurements of some mechanical engineering quantities i.e. temperature, pressure, flow, energy.

ME 202 Automotive Technology **2 (1-3-2)**

Prerequisite : IE 158

Principles of internal combustion engines. Cycles of operation. Types and components of engine. Ignition. Fuelling. Lubrication. Cooling systems. Practical training in dismantling and assembling of engine. Performance testing. Maintenance and trouble shooting.

ME 221 Engineering Mechanics II **3 (3-0-6)**

Prerequisite : CE 202

Revision of basic principles governing the laws of motion. Kinematics of particles and rigid bodies: displacement, velocity, and acceleration. Absolute and relative motion. Kinetics of particles and rigid bodies. Newton's second law of motion. Force. Mass. Acceleration. Work and energy. Impulse and momentum. Centripetal motion. Introduction to vibration.

ME 241 Mechanics of Fluids I **3 (3-0-6)**

Prerequisite : SC 133

Properties of fluids. Fluid statics. Buoyancy. Momentum equation. Energy equation. Moment of momentum equation and its application to tur-

bomachinery. Kinematics of incompressible and non-viscous fluid flow. Dimensional analysis and dynamic similitude. Incompressible and viscous fluid flow. Control volume. Fluid measurement. Compressible flow.

ME 302 Mechanical Engineering Laboratory I 2 (0-4-2)

Prerequisite : ME 201 (except non-ME students), ME 241, ME 221, AE 211

Basic experiments in mechanics of fluids, Thermodynamics and mechanics of solids. Introduction to instrumentation and experimental procedures. Analysis of data and result. Report preparation.

ME 303 Mechanical Engineering Laboratory II 2 (0-4-2)

Prerequisite : ME 302, ME 322, ME 323, ME 331, ME 342

Additional experiments in mechanics of fluids, thermodynamics, mechanics of solids and mechanics of machines.

ME 304 Industrial Training 0 (0-0-0)

Prerequisite : Junior standing.

Students must be trained at least six consecutive weeks in industry or similar sector. Submission of report is required together with comment or certification from the trainer.

ME 313 Mechanical Design I 3 (2-3-4)

Prerequisite : ME 322, ME 112

Principles and significance of design. Philosophy and method. Factors affecting design. Theory of failure. Stress concentration. Failure under unsteady load. Design of simple machine elements i.e. spring, power screws, riveted joints, bolted joints, welded joints, etc.

ME 322 Mechanics of Solids II 3 (3-0-6)

Prerequisite : CE 221

Deflection of composite beams : variable cross sectioned beams and curved beams. Mohr's circle. Analysis of beam deflection by energy method. Unsymmetrical sectioned. Shear stress and shear centre. Torsion of non-circular cross sectioned members. Torsion of thin-walled cylinder of open and closed sections. Stress in thick walled cylinders and rotating discs. Analysis of statically indeterminate structures by superposition, energy, and three-moment equation methods. Theories of failure. Introduction to theories of elasticity, plasticity, and visco-elasticity. Repeated load. Fatique in metal.

ME 323 Mechanics of Machines **3 (3-0-6)**

Prerequisite : ME 221

Basic mechanisms and terminology. Kinematics of rigid bodies. Relative motion. Mathematical and graphical analyses of kinematics of gear trains, cams, linkages, and some power transmission mechanisms. Kinetics of rigid bodies. D'Alembert's principle. Analysis of forces in mechanisms. Balancing of machinery. Flywheel. Gyroscope.

ME 324 Mechanical Vibrations **3 (3-0-6)**

Prerequisite : MA 204, ME 323

The behavior of lumped systems with single degrees of freedom. Natural frequency and damping effects. Principles of vibration isolation and vibration measuring instruments. Lumped systems with two degrees of freedom: natural frequencies, modes, and mode shapes. Principle of dynamics vibration absorbers. Lumped systems with several degrees of freedom. Whirling of shafts. Introduction of distributed parameter systems. Introduction to non-linear systems.

ME 331 Thermodynamics II **3 (3-0-6)**

Prerequisite : AE 211

Irreversibility and availability. Power cycles and refrigeration cycles. Thermodynamics relation. Mixtures and solutions. Combustion processes and analysis of combustion products.

ME 332 Heat Transfer **3 (3-0-6)**

Prerequisite : ME 331, ME 342

One and two-dimensional steady state heat conduction. One dimensional unsteady state conduction. Dimensional analysis in convection heat transfer. Natural convection on plane and cylindrical surfaces. Forced convection on circular pipe, plane surface and in conduits. Simplified analysis in convection heat transfer. Relationship between heat transfer and fluid friction. Condensation and boiling. Absorption and emission characteristics. Angle factor. Radiation of black and gray bodies. Heat exchangers.

ME 342 Mechanics of Fluids II **3 (3-0-6)**

Prerequisite : ME 241

Kinematics of fluid flow. Steady and unsteady flows. Uniform and non uniform flows. Dimensions of flow. Streamlines. Path lines and stream function. Fluid strain and rotation. Flownets. Circulation and rotational flow. Radial flow. Equations of motion and energy. Laminar flows in closed conduits

and shear stresses. Annulus flow and flow between parallel walls. Shear stresses in turbulent flows. Velocity distribution. Laminar and turbulent boundary layers. Flow past submerged bodies. Separation, circulation and lift force.

ME 391 Fundamentals of Mechanical Engineering 3 (3-0-6)

Prerequisite : ME 221, ME 241, AE 211

(This courses is provided for non-ME students)

Analysis of engineering cycles with applications to steam power plants, gasturbine plants, internal-combustion engine plants, refrigeration plants, air conditioning plants, and heat pump. Basic heat transfer: conduction, convection, radiation, and heat exchangers. Kinematics of rigid bodies. Analysis of linkages, cams,gear trains, and power transmission devices.

ME 392 Machine Design 3 (2-3-4)

Prerequisite : CE 221, IE 121

(This courses is provided for non-ME students)

Metallurgical and mechanical properties of engineering materials. Analysis of stress, strain and deflection. Theory of failure of materials. Design of machine elements such as shafts, keys, splines, couplings. Lubrication. Roller bearing and journal bearing. Gear trains, clutch, brake, belt, chain, spring, power screws. Bolted joints and riveted joints. Welding joints.

ME 405 Mechanical Engineering Laboratory III 2 (0-4-2)

Prerequisite : ME 303, ME 324, ME 332

Additional experiments in the fields of power plant engineering. Heat transfer. Automatic control system. Mechanical vibrations and gas dynamics.

ME 406 Projects Seminar 0 (0-3-0)

Prerequisite : Senior standing .

This course is concurrent with ME 407. Students will be trained in presenting technical reports to an audience. The report must be related to the work in ME 407.

ME 407 Mechanical Engineering Project 3 (0-6-3)

Prerequisite : ME 406

Students must undertake projects of various topics in mechanical engineering under the supervision of a staff member.

ME 414 Mechanical Design II **3 (2-3-4)**

Prerequisite : ME 313

The design of machine elements for power transmission such as shafts, keys and keyways seals, flywheels, couplings, clutches, brakes, bearings, belts, chains, gears and cams. Design projects.

ME 415 Plant Engineering **3 (3-0-6)**

Prerequisite : Senior standing.

Plant location and layout. Design, installation, control and maintenance of various systems such as electrical system, hot water system, chilled water system, steam system, compressed air and gas systems, fire protection system.

ME 416 Engineering Piping System Design **3 (3-0-6)**

Prerequisite : Senior standing.

Design and specification of piping systems in building such as hot and chilled water piping, compressed air and gas piping, drainage and vent piping, steam and condensate piping, steam trapping, pressure reduction in pipes.

ME 417 Automotive Engineering **3 (3-0-6)**

Prerequisite : ME 201

Basic principles. Electrical, ignition, instrumentation and control systems. Car compoments. Chassis types. Suspension. Transmission and brake systems. Repair and maintenance.

ME 425 Automatic Control System **3 (3-0-6)**

Prerequisite : ME 324

Introduction to control systems. Basic system components. Linear systems and feedbacks. Mathematical modelling of systems. Response solutions and response characteristics of systems. Transient behavior and performance criteria. Stability of systems. Error coefficients and error criteria. Analysis of linear control systems by the root-locus and the frequency-response methods. Basic control actions. Improving system performance using compensation techniques. Introduction to the state variable method of analysis.

ME 426 Mechanics of Solids III **3 (3-0-6)**

Prerequisite : ME 322

Beams on elastic foundation. Theory of thin plates and shells, and methods of solution. Experimental stress analysis: photoelasticity, resistant

strain gauges, and other methods of strain measurements. Introduction to theories of elasticity and plasticity with engineering applications.

ME 427 Agricultural Machinery 3 (3-0-6)

Prerequisite : Permission from instructor.

Basic principles. Types, structure, operation and maintenance of farm machinery. Selection and performance testing. Specification of some selected machinery.

ME 433 Refrigeration and Air Conditioning 3 (3-0-6)

Prerequisite : ME 332

Review of thermodynamics principles. Methods of refrigeration and refrigeration systems. Single stage and two stages mechanical vapor compression refrigeration cycles. Main components: compressor, condenser, evaporator, refrigerant flow control. Auxiliary equipment. Refrigerants. Psychrometrics. Air conditioning system design.

ME 434 Power Plant Engineering 3 (3-0-6)

Prerequisite : ME 331

Types and characteristics of power plants. Load system and load distribution. Economics of electricity generation. Hydro plant. Diesel power plant. Steam power plant. Steam turbine. Boiler. Condenser. Feed water heater and auxiliary equipment. Characteristic and limitation of gas turbine power plant. Combined cycle power plant. Introduction to nuclear power plant. Nuclear fuel. Direct and indirect cycles. Other types of power plant.

ME 435 Internal Combustion Engines 3 (3-0-6)

Prerequisite : ME 331

Engine components and testings. Thermodynamics of spark ignition and compression ignition engines. Combustion processes, detonation and knock. Power output. Smoke limit. Exhaust gas analysis and pollution control. Equilibrium charts. Fuels, carburetion and injection systems. Supercharging. Engine performance analysis and design.

ME 436 Gas Turbine Theory 3 (3-0-6)

Prerequisite : ME 331, ME 342

Gas turbine cycle producing shaft power output. Components. Performance improvement. Aircraft gas turbines. Compressors. Combustion systems. Performance analysis at various operating conditions.

ME 437 Advanced Refrigeration and Air Conditioning **3 (3-0-6)**

Prerequisite : ME 433

Refrigerants. Analysis of multi-stages vapor compression cycles. Design of cold storage. Cryogenics. Air liquefaction. Refrigeration system control. Air conditioning system design in various types of building.

ME 443 Mechanics of Fluids III **3 (3-0-6)**

Prerequisite : ME 342

Dynamics of fluid flow: force on a submerged cylinder, and Joukowski transformation. Airfoil characteristics and applications to turbine blade design. Three-dimensional wing theory: induced drag and airfoil sections. Gas dynamics. One-dimensional and isentropic flow of perfect gas. Isentropic flow through ducts of variable cross-sectioned areas. Choking effects and normal shock wave. Flow in constant-area ducts with friction and heat transfer. Oblique shock wave. Plandtl-Meyer flow and methods of analysis.

ME 444 Turbo Machinery **3 (3-0-6)**

Prerequisite : ME 241

Principles of fluid mechanics when applied to fluid machinery. Theory of positive displacement pumps and performance characteristics. Dimensional analysis and characteristic performance of turbomachines. Classification of centrifugal fluid machines, pumps and compressors. Design of impeller casing and piping circuits. Two-dimensional cascade: lift and drag forces, optimum space-chord ratio. Theory of axial-flow machines.

ME 445 Fluid Power **3 (3-0-6)**

Prerequisite : ME 241

Fundamentals of fluid power system and applications. Hydraulic and pneumatic circuit. Design and equipment s election such as pumps, compressors, valves. Characteristic and performance of the system. Installation, maintenance, testing and trouble-shooting.

ME 451 Energy Conversion **3 (3-0-6)**

Prerequisite : ME 331

Conversion to mechanical energy from various sources such as tidal energy, wind energy, and heat energy from fossil fuels and nuclear reaction. Magneto hydrodynamic conversion.

ME 452 Non-Conventional Energy 3 (3-0-6)

Prerequisite : Permission from instructor.

Potential and applications of solar energy, and tidal energy. Design and performance testing of solar water heater, solar still and wind turbine. Energy conversion from biomass.

ME 453 Energy Management in Building 3 (3-0-6)

Prerequisite : Permission from instructor.

Energy auditing program for building and facilities. Design of building and related mechanical systems for optimization of energy consumed. Utilization of computer in energy management.

ME 454 Energy Management in Industry 3 (3-0-6)

Prerequisite : ME 331

Energy balance of various equipment in industry. Efficiency improvement. Waste heat recovery methods. Analysis of second law of thermodynamics. Electricity generation. Cogeneration. Energy management.

ME 481 Special Topics in Mechanical Engineering I (3-0-6)

Prerequisite : Permission from instructor.

Studies on the new technology and modern development of topics of special interest in mechanical engineering.

ME 482 Special Topics in Mechanical Engineering II 3 (3-0-6)

Prerequisite : Permission from instructor.

Studies on the new technology and modern development of topics of special interest in mechanical e ngineering.

ME 483 Special Topics in Mechanical Engineering III 3 (3-0-6)

Prerequisite : Permission from instructor.

Studies on the new technology and modern development of topics of special interest in mechanical engineering.

ME 484 Special Topics in Mechanical Engineering IV 3 (3-0-6)

Prerequisite : Permission from instructor.

Studies on the new technology and modern development of topics of special interest in mechanical engineering.

③ カリキュラムの概要

Course Planning for Mechanical Engineering Students

First Year

Course Number	Title	Credits (lecture-lab-self study)
Semester 1		
LE 121	Computer for Engineers	2(2-0-4)
ME 111	Engineering Drawing I	2(1-3-2)
CE 102	Introduction to Engineering	1(1-0-2)
MA 101	Mathematics I	3(3-0-6)
SC 124	Chemistry for Engineers I	4(3-3-6)
SC 133	Physics for Engineers I	4(3-3-6)
EL xxx	English Course x	3(5-0-4)
		19(18-9-30)
Semester 2		
ME 112	Engineering Drawing II	2(1-3-2)
IE 121	Material Science I	3(3-0-6)
IE 158	Engineering Tools & Operations	2(1-3-2)
MA 102	Mathematics II	3(3-0-6)
SC 125	Chemistry for Engineers II	2(2-0-4)
SC 134	Physics for Engineers II	4(3-3-6)
EL xxx	English Course x	3(5-0-4)
		19(18-9-30)

Second Year

Course Number	Title	Credits (lecture-lab-self study)
Semester 3		
ME 201	Basic Mechanical Engineering Laboratory	1(0-3-0)
LE 201	Basic Electrical Engineering Laboratory	1(0-3-0)
LE 211	Electrical Circuit Analysis	3(3-0-6)
IE 201	Engineering Management	3(3-0-6)
IE 261	Engineering Statistics	3(3-0-6)
CE 202	Engineering Mechanics I	3(3-0-6)
AE 211	Thermodynamics I	3(3-0-6)
MA 203	Mathematics III	3(3-0-6)
		20(18-6-36)

Semester 4

ME 202	Automotive Technology	2(1-3-2)
ME 221	Engineering Mechanics II	3(3-0-6)
ME 241	Mechanics of Fluids I	3(3-0-6)
LE 212	Basic Electronic Circuits and Devices	3(3-0-6)
CE 221	Mechanics of Solids I	3(3-0-6)
MA 204	Mathematics IV	3(3-0-6)
MA 305	Numerical Methods	3(3-0-6)
		20(19-3-38)

Third Year

Course Number	Title	Credits (lecture-lab-self study)
	Semester 5	
ME 302	Mechanical Engineering Laboratory I	2(0-4-2)
ME 322	Mechanics of Solids II	3(3-0-6)
ME 323	Mechanics of Machines	3(3-0-6)
ME 331	Thermodynamics II	3(3-0-6)
ME 342	Mechanics of Fluids II	3(3-0-6)
IE 358	Manufacturing Process	3(3-0-6)
TU xxx	Social Sciences Electives	3(3-0-6)
		20(18-4-38)
	Semester 6	
ME 303	Mechanical Engineering Laboratory II	2(0-4-2)
ME 313	Mechanical Design I	3(2-3-4)
ME 324	Mechanical Vibrations	3(3-0-6)
ME 332	Heat Transfer	3(3-0-6)
LE 202	Electromechanical Energy Conversion Laboratory	1(0-3-0)
LE 242	Electromechanical Energy Conversion I	3(3-0-6)
TU xxx	Humanities Electives	2(2-0-4)
ME xxx	Technical Electives	3(3-0-6)
		20(16-10-34)
ME 304	Industrial Training (Not less than 6 consecutive weeks)	0 credit

Fourth Year

Course Number	Title	Credits (lecture-lab-self study)
	Semester 7	
ME 405	Mechanical Engineering Laboratory III	2(0-4-2)
ME 406	Projects Seminar	0(0-3-0)
ME 414	Mechanical Design II	3(2-3-4)
ME 425	Automatic Control System	3(3-0-6)
ME 433	Refrigeration and Air Conditioning	3(3-0-6)
ME 434	Power Plant Engineering	3(3-0-6)
IE 302	Engineering Economy	3(3-0-6)
		17(14-10-30)
	Semester 8	
ME 407	Mechanical Engineering Project	3(0-6-3)
ME 435	Internal Combustion Engines	3(3-0-6)
ME xxx	Technical Electives	3(3-0-6)
ME xxx	Technical Electives	3(3-0-6)
xx xxx	Free Electives	3(3-0-6)
		15(12-6-27)

④ 実験・実習の要領

ME LAB SCHEDULE

	G1	G2	G3	G4	G5	G6	DAY1
	G7	G8	G9	G10	G11	G12	DAY2
WEEK 3	X1	X2	X3	X4	X5	X6	
WEEK 4	X6	X1	X2	X3	X4	X5	
WEEK 5	X5	X6	X1	X2	X3	X4	
WEEK 6	X4	X5	X6	X1	X2	X3	
WEEK 7	X3	X4	X5	X6	X1	X2	
WEEK 8	X2	X3	X4	X5	X6	X1	
WEEK 9	X7	X8	X9	X10	X11	X12	
WEEK 10	X12	X7	X8	X9	X10	X11	
WEEK 11	X11	X12	X7	X8	X9	X10	
WEEK 12	X10	X11	X12	X7	X8	X9	
WEEK 13	X9	X10	X11	X12	X7	X8	
WEEK 14	X8	X9	X10	X11	X12	X7	

G= Groups of Students (maximum=12) with 3-4 students per group
X=number of experiments (maximum=12)

付属資料６．化学工学科関連資料

① カリキュラム
② タイ国政府の予算による購入及び購入予定物品
③ 学生実験の内容
④ テキストブック

① カリキュラム

Course Planning for Chemical Engineering Students

First Year

Course Number	Title	Credits (lecture-lab-self study)
Semester 1		
LE 121	Computer for Engineers	2(2-0-4)
CE 102	Introduction to Engineering	1(1-0-2)
ME 111	Engineering Drawing I	2(1-3-2)
SC 124	Chemistry for Engineers I	4(3-3-6)
SC 133	Physics for Engineers I	4(3-3-6)
MA 101	Mathematics I	3(3-0-6)
EL xxx	English Course x	3(5-0-4)
		19(18-9-30)
Semester 2		
IE 121	Material Science I	3(3-0-6)
IE 158	Engineering Tools & Operations	2(1-3-2)
ME 112	Engineering Drawing II	2(1-3-2)
SC 134	Physics for Engineers II	4(3-3-6)
SC 125	Chemical for Engineering II	4(3-3-6)
MA 102	Mathematics II	3(3-0-6)
EL xxx	English Course x	3(5-0-4)
		19(18-9-30)

Second Year

Course Number	Title	Credits (lecture-lab-self study)
	Semester 3	
AE 201	Analytical Chemistry	3(3-0-6)
AE 202	Physical Chemistry	3(3-0-6)
AE 204	Material and Energy Balance I	2(2-0-4)
AE 211	Thermodynamics I	3(3-0-6)
AE 281	Analytical Chemistry Laboratory	1(0-3-0)
LE 241	Introduction to Electrical Engineering	3(2-3-4)
CE 202	Engineering Mechanics I	3(3-0-6)
MA 203	Mathematics III	3(3-0-6)
		21(19-6-38)
	Semester 4	
AE 203	Organic Chemistry	3(3-0-6)
AE 205	Material and Energy Balance II	2(2-0-4)
AE 212	Chemical Engineering Thermodynamics	3(3-0-6)
AE 282	Physical Chemistry Laboratory	1(0-3-0)
AE 283	Organic Chemistry Laboratory	1(0-3-0)
CE 221	Mechanics of Solids I	3(3-0-6)
ME 221	Engineering Mechanics II	3(3-0-6)
ME 241	Mechanics of Fluids I	3(3-0-6)
MA 204	Mathematics IV	3(3-0-6)
		22(20-6-40)

Third Year

Course Number	Title	Credits (lecture-lab-self study)
Semester 5		
AE 305	Transport Phenomena	3(3-0-6)
AE 321	Chemical Engineering Unit Operation Design I	3(3-0-6)
AE 322	Chemical Engineering Kinetics and Reactor Design	3(3-0-6)
AE 384	Chemical Engineering Laboratory I	1(0-3-0)
IE 201	Engineering Management	3(3-0-6)
IE 261	Engineering Statistics	3(3-0-6)
IE 302	Engineering Economy	3(3-0-6)
		19(18-3-36)
Semester 6		
MA 305	Numerical Methods	3(3-0-6)
AE 307	Transport Phenomena	3(3-0-6)
AE 308	Chemical Process Engineering	3(3-0-6)
AE 323	Chemical Engineering Unit Operation Design II	3(3-0-6)
AE 385	Chemical Engineering Laboratory II	1(0-3-0)
AE xxx	Technical Electives	3(3-0-6)
TU xxx	Humanities Electives	2(2-0-4)
		18(17-3-34)
AE 391	Industrial Training (Not less than 180 hours)	0 credit

Fourth Year

Course Number	Title	Credits (lecture-lab-self study)
	Semester 7	
AE 425	Chemical Engineering Unit Operation Design III	3(3-0-6)
AE 426	Process Dynamics Control	3(3-0-6)
AE 427	Chemical Engineering Plant Design	3(3-0-6)
AE 441	Industrial Waste Treatment	3(3-0-6)
AE 486	Chemical Engineering Laboratory III	1(0-3--0)
AE 492	Chemical Engineering Seminar	1(0-3-0)
TU xxx	Social Sciences Electives	3(3-0-6)
		~~19(18-3-36)~~ 17(15-6-30)
	Semester 8	
AE 493	Chemical Engineering Project	3(0-6-3)
AE xxx	Technical Electives	3(3-0-6)
AE xxx	Technical Electives	3(3-0-6)
IE 231	Industrial Safety	3(3-0-6)
xx xxx	Free Electives	3(3-0-6)
		12(9-6-21)

6.3 Equipment Receiced from Thai Government

List of Chemical Engineering Equipment Expected in 1994

[Governmental Budget]

No.	Qty.	Description	Price (Bht)
1.	1 set	Chemistry Laboratory Desks set	400,000
2.	1 set	Accessories needed for developing rooms	250,000
3.	40 pcs	Chemistry Laboratory Chairs	55,600
4.	6 pcs	Fire Extinguishers	36,000
5.	1 set	Shelves in Chemistry Laboratory	29,000
6.	12 set	Lockers for students	68,400
7.	1 set	Boiler and Accessories	2,000,000
8.	1 set	Oven	80,000
9.	1 set	Electrical Balances	1,250,000
10.	1 set	Centrifuges	150,000
11.	1 set	Water Purifier System	500,000
12.	1 set	Thermostatic Baths	220,000
13.	1 set	Potentiometer	110,000
14.	1 set	Conductivity Meter	70,000
15.	1 set	Shaker Bath	155,000
16.	1 set	Digital pH Meter	50,000
17.	1 set	Magnetic Stirrers	10,000
18.	1 set	Digital Thermometer	20,000
19.	1 set	Refractometers	160,000
20.	1 set	Ice-maker and Refrigerator	200,000
21.	1 set	Bomb Calorimeter	725,000
22.	1 set	Viscosity Meter	500,000
23	1 set	Multiple-Effect Evaporator with Control System	1,800,000
24.	1 set	Fluidized-bed Dryer	500,000
25	1 set	Cooling Tower	800,000
26.	1 set	Plate Filtration Unit	610,000
27.	1 set	Cascade Stirrer System	610,000
28.	1 set	Absorption Unit	1,600,000
29.	1 set	Sedimentation	30,000
30.	1 set	Hot Plate set	48,000
31.	1 set	Gas Chromatography	1,123,000
		Total (Bht)	13,700,000

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List of Equipment Expected in 1995 from Governmental Budget

No.	Qty.	Description	Price (Bht)
1.	1 set	Centrifugal Pump Appartus	220,000
2.	1 set	Pipe set	120,000
3.	1 set	Jar Tester	120,000
4.	1 set	Conduction Analysis	900,000
5.	1 set	Convection Analysis	900,000
6.	1 set	Radiation Analysis	900,000
7.	1 set	Crystallization	1,500,000
(8)	1 set	Condensation & Boiling Apparatus	1,000,000
9.	1 set	Adsorption Unit	1,800,000
(10)	1 set	Heat Exchanger Unit	1,100,000
11.	1 set	Diffusivity Coefficient Apparatus	90,000
12.	1 set	Homogenizer	450,000
13.	1 set	pH Meter	130,000
14.	1 set	Pump Set	600,000
15.	1 set	Temperature Measurement set	600,000
16.	1 set	Pressure Measurement set	600,000
17.	1 set	Flow Measurement set	1,200,000
18.	1 set	Freeze Dryer	600,000
19.	1 set	Magnatic Sterrers	100,000
20.	1 set	Ultra Filtration	200,000
21.	1 set	Polarimeter	650,000
		Total (Bht)	13,980,000

③ 学生実験の内容

Contents of all Laboratory courses of the Department

Analytical Chemistry	Physical Chemistry	Organic Chemistry
1. Fundamental Practice	1. Gas	1. Fundamental Practice
2. Gravimetric Analysis 1	2. Solution 1	2. Crystallization
3. Analysis 2	3. Solution 2	3. Extraction
4. Volumetric Analysis 1	4. Phase Diagram 1	4. Distillation 1
5. Volumetric Analysis 2	5. Phase Diagram 2	5. Distillation 2
6. Inorganic Qualitative Analysis 1	6. Kinetics 1	6. Alkane, Alkene, Benzene and Naphthalene
7. Inorganic Qualitative Analysis 2	7. Kinetics 2	7. Alkyl Halide
8. Organic Qualitative Analysis 1	8. Viscosity	8. Alcohol
9. Organic Qualitative Analysis 2	9. Electrochemistry 1	9. Aldehyde, Ketone
10. Analytical Instruments 1	10. Electrochemistry 2	10. Carboxylic Acid
11. Analytical Instruments 2	11. Spectrophotometry	11. Amine

ChemEng Lab1	ChemEng Lab2	ChemEng Lab3
1. Centrifugal Pump Performance	1. Conduction	1. Distillation 4,5
2. Mixing 10	2. Force Convection	2. Liquid-Liquid Extraction 1
3. Flow in Pipe & Flow Measurement	3. Radiation	3. Solid-Fluid Extraction 2
4. Sedimentation	4. Heat Exchanger Unit	4. Cooling Tower
5. Fluidization	5. Drum Dryer 11	5. Controlled Evaporator 3
6. Ball Mill & Sieve Analysis 12	6. Evaporator	6. Cascade Stirrers
7. Efflux Time	7. Spray Dryer 6	7. Reactor 2 7
8. Viscosity of Newtonian & Non-Newtonian Fluids	8. Crystallization	8. Absorption
~~Air Tester~~	9. Reactor 1 8,9	9. Adsorption
10. Filtration	10. Film & Drop Condensation	10. Diffusion Coefficient

④ テキストブック

List of Textbooks and References for lectures
Department of Chemical Engineering
(5 copies each)

Courses	Textbooks or References
AE 201 Analytical Chemistry	Larry G. Hargis, *Analytical Chemistry (Principles and Technique)*, Prentice-Hall
AE 202 Physical Chemistry	Alberty and Silbey, *Physical Chemistry*, Wiley. Atkins, *The Elements of Physical Chemistry*, Oxford.
AE 203 Organic Chemistry	Stokes, B.J., *Organic Chemistry*, Arnold. Pine, *Organic Chemistry*, McGraw-Hill.
AE 204 Material & Energy Balance I	Himmelblan, *Basic Priciples and Calculation in Chemical Engineering*, Prentice-Hall.
AE 205 Material & Energy Balance II	Felder and Rousseau, *Elementary Principles of Chemical Processes.* Wiley.
AE 211 Thermodynamics I	Van Wylen and Sonntag, *Fundamentals of Classical Thermodynamics.* Wiley. Rogers, *Engineering Thermodynamics : Work & Heat Transfer*, Longman
AE 212 Chemical Engineering Thermodynamics	Balzhhizer, Samules and Elliassen, *Chemical Engineering Thermodynamics*, Prentice-Hall. Smith and Van Ness, *Introduction to Chemical Engineering Thermodynamics*, McGraw-Hill.
AE 306, 307 Transport Phenomena I, II	Bird, Stewart and Lightfoot, *Transport Phenomena*, Wiley. Welty and Wicks, *Fundamentals of Momentum, Heat and Mass Transfer*, Wiley.
AE 321, 323, 425 Chemical Engineering Unit Operation Design I, II, III	Geankoplis, *Tranport Process and Unit Operations*, Prentice-Hall. Foust, et. al., *Principles of Unit Operations*, Wiley. McCabe, Smith and Harriot, *Unit Operations of Chemical Engineering*, McGraw-Hill.
AE 322 Chemical Engineering Kinetics and Reactor Design	Levenspiel, *Chemical Reaction Engineering*, Wiley Fogler, *Elements of Chemical Kinetic and Reactor Design*, Prentice-Hall.
AE 324 Chemical Engineering Reactor Design	Hill, *an Introduction to Chemical Engineering Kinetics and Reactor Design*, Wiley.

List of Textbooks and References for Lectures(cont.)

Courses	Textbooks or Refferences
AE 426 Process Dynamic and Control	Seborg, Edgar and Mellicharp, *Process Dynamics and Control*, Wiley. Luyben, *Process Modelling, Simulation and Control for Chemicals Engineers*, McGraw-Hill. Coughanowr and Koppel, *Process System Analysis and Control*, McGraw-hill.
AE 427 Chemical Engineering Plant Design	Douglas, *Conceptual Design of Chemical Process*, Wiley. Peter and Timmerhous, *Plant Design and Economics for Chemical Engineers*, McGraw-Hill.
AE 441 Industrial Waste Treatment	Cheremisnof and Young, *Air Pollution Control and Design Handbook : (Part I & II)*, Marcel Dekker. Vernick and Walker, *Handbook of Waste Water Treatment Processes*, Marcel Dekker. Humenick, *Water and Wastewater Treatments: Calculations for Chemical & Physics Processes*, Marcel Dekker.

付属資料７．関連教育機関等資料

① モンクット王工科大学
② パトムワン工業高校拡充計画
③ タイ国の教育制度
④ EITの組織

① モンクット王工科大学

แผนภูมิการแบ่งส่วนราชการ สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง
ORGANIZATION CHART OF KING MONGKUT'S INSTITUTE OF TECHNOLOGY LADKRABANG

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KING MONGKUT'S INSTITUTE OF TECHNOLOGY LADKRABANG

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- กองการเจ้าหน้าที่ DIVISION OF PERSONEL
- กองอาคารสถานที่ DIVISION OF LAND AND BUILDINGS

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  DEPARTMENT OF AGRICULTURAL EDUCATION

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[illegible]

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  DIVISION OF ACQUISITION
- ฝ่ายวารสาร
  DIVISION OF PERIODICAL
- ฝ่ายวิเคราะห์ทรัพยากรห้องสมุด
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- ฝ่ายบริการ
  DIVISION OF LIBRARY SERVICES
- ฝ่ายโสตทัศนศึกษา
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- ฝ่ายฐานข้อมูลห้องสมุด
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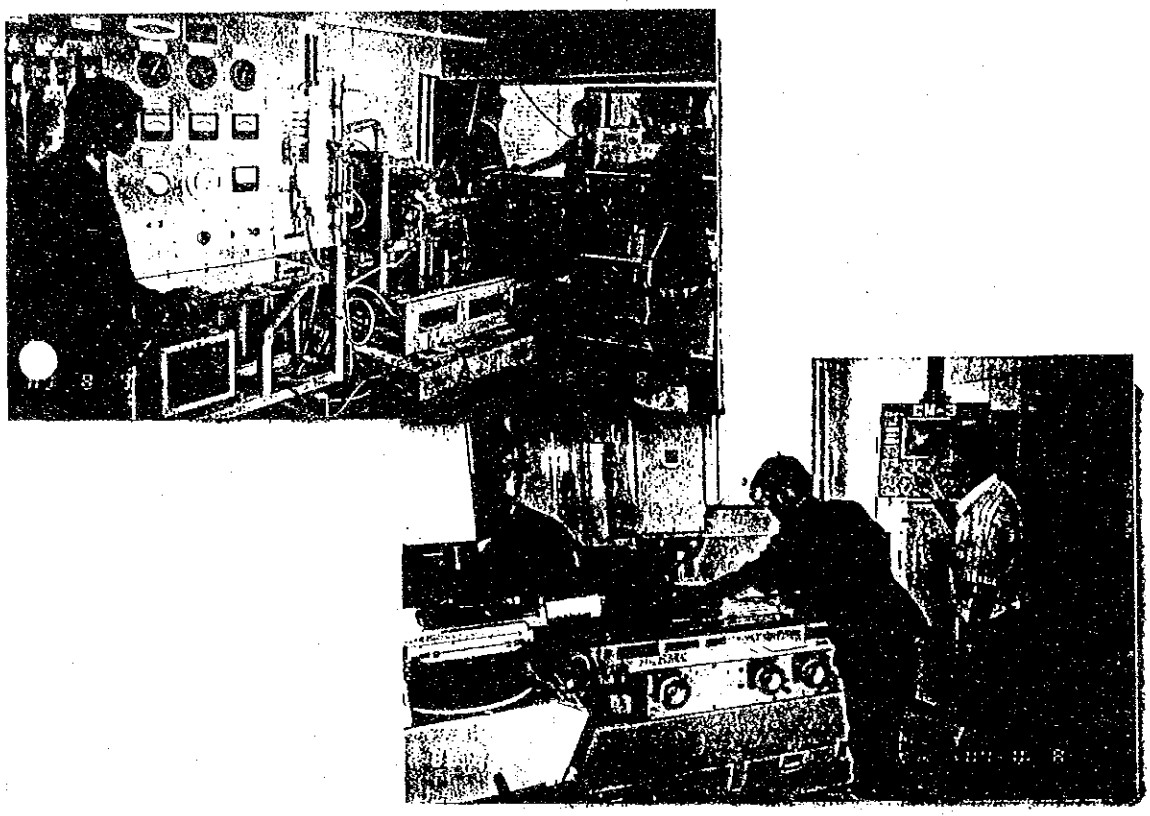
ภาควิชาวิศวกรรมเครื่องกล

DEPARTMENT OF MECHANICAL ENGINEERING



ภาควิชามีวัตถุประสงค์ในการปูพื้นฐานให้นักศึกษาสามารถใช้ทฤษฎีวิเคราะห์ปัญหาทางเครื่องกลได้ และสร้างความเชื่อมั่นในตัวนักศึกษา โดยให้ทำการทดลองในห้องปฏิบัติการ บัณฑิตในหลักสูตรวิศวกรรมเครื่องกลที่สำเร็จการศึกษาไปตั้งแต่ พ.ศ.2524 เป็นต้นมา ได้นำความรู้ไปใช้อย่างกว้างขวางในอุตสาหกรรม ตั้งแต่ปี พ.ศ.2531 เป็นต้นมา ภาควิชาได้รับความช่วยเหลือทางด้านเทคนิคจากประเทศญี่ปุ่น

ภาควิชาดำเนินการวิจัยทางด้านเทคโนโลยีเครื่องยนต์ พลศาสตร์อากาศ เทคโนโลยีพลังงาน และเทคโนโลยีที่เหมาะสม เพื่อประโยชน์ต่ออุตสาหกรรมของประเทศ พร้อมกันนี้ก็มีหลักสูตรระดับปริญญาโทด้วย

The conceptual aim of the Department is to give students some fundamentals of how to analyse mechanical problems theoretically and their confidences can be strengthened through experiments in the laboratories. Graduates in the course of Mechanical Engineering from this Department since 1981 up to now have made use of the knowledge they gained to serve extensively in the industry. In recent years we have the share in assimilating the high technologies of the modern world; technical cooperation with Japan has been operative since 1988.

The Department also carries out some comprehensive research in engine technology, aerodynamics, energy technology, and appropriate technology in order to keep pace with the industries, as well as provides courses leading to a master's degree.

(15)

② パトムワン工業高校拡充計画

プロジェクト紹介：「パトムワン工業高等専門学校拡充計画」

1）要請の背景・経緯

農業中心の経済構造から脱皮を図り、工業国として著しい発展を遂げつつあるタイ国は、その急激な産業構造の変化に対して国内体制が追いつかず、技術者の不足が深刻化しており、質の高い技術者の産業界への供給が急務となっている。

このような事情を背景に、タイ国政府は教育省職業教育局下のパトムワン工業高等専門学校をタイ国の工業専門学校の核として位置づけ、同校を新技術分野の技術者養成の中心的存在とする構想のもと、３２百万バーツの予算を計上して新校舎を建設するとともに、１９９０年日本政府へ電子工学教育関連機材の無償資金協力と、教官のレベル・アップ及び技術者の育成を目的としてプロジェクト方式技術協力を要請越した。

日本政府は、１９９１年同校に対し約６億円の無償資金協力を実施することを決定し、電子工学関連分野の実験・実習用機材と教育補助用機材としてビデオ教材製作機材、ＬＬ教室用機材を供与、１９９３年３月に機材の納入・据え付けを完了した。

同校では、上級職業課程（日本の短大の年次に相当）が６学科設置されているほか、その卒業生が進学するディプロマ職業課程（日本の大学の３・４年の年次に相当）３学科が設置されているが、現在（１９９３年）教育省職業教育局と同校において無償資金協力の機材を利用して新たに学士を付与するコースとしてメカトロニクス学科を開設する作業を進めている。この学科は１９９４年６月に開設する見込みとなっている。

プロジェクト方式技術協力では、このメカトロニクス学科の学士課程に焦点を絞り、カリキュラムの作成ほか、学科開設に必要な技術移転を実施する。

2）プロジェクト概要

協力分野 ：・メカトロニクス学科（学士課程）の新設に必要なカリキュラム作成
・自動制御
・マイクロコンピュータ
・ＣＡＤ
・ＣＡＭ＆ＣＮＣ
・計器操作
・流体力学
・プロセス制御
・ロボティックス
・ディジタル・コントロール・システム
・ファクトリー・オートメーション
・センサー技術

専門家派遣：長期専門家　常時２～４名を派遣
短期専門家　毎年度３名程度を派遣

研修員受入：毎年度３名受け入れ

機材供与　：上記１１科目の実験用資機材及びスペアパーツ

協力機関　：１９９３年４月１日～１９９８年３月３１日

タイ側実施機関：
教育省、職業教育局

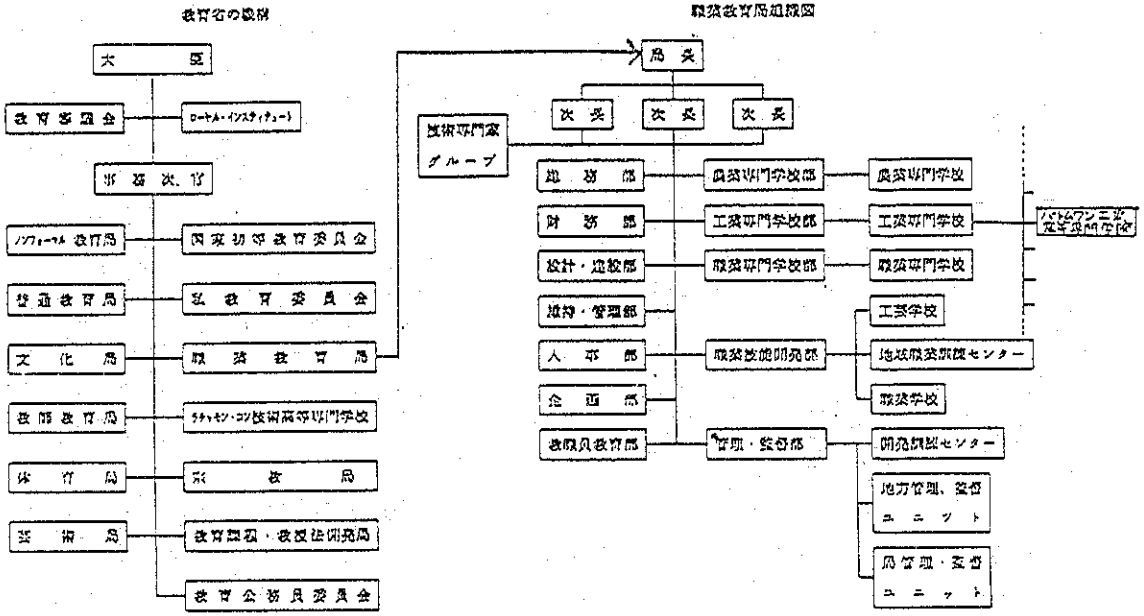
プロジェクトサイト：
バンコク市内、ラマ一世通り

無償資金協力との関連：
１９９１年度無償資金協力供与済み（６．１８億円）
（工業電子工学科
計操プロセス制御工学科
メカトロニクス学科の実験・実習用機材
ビデオ製作・教材印刷・ＬＬ用学習補助機材）

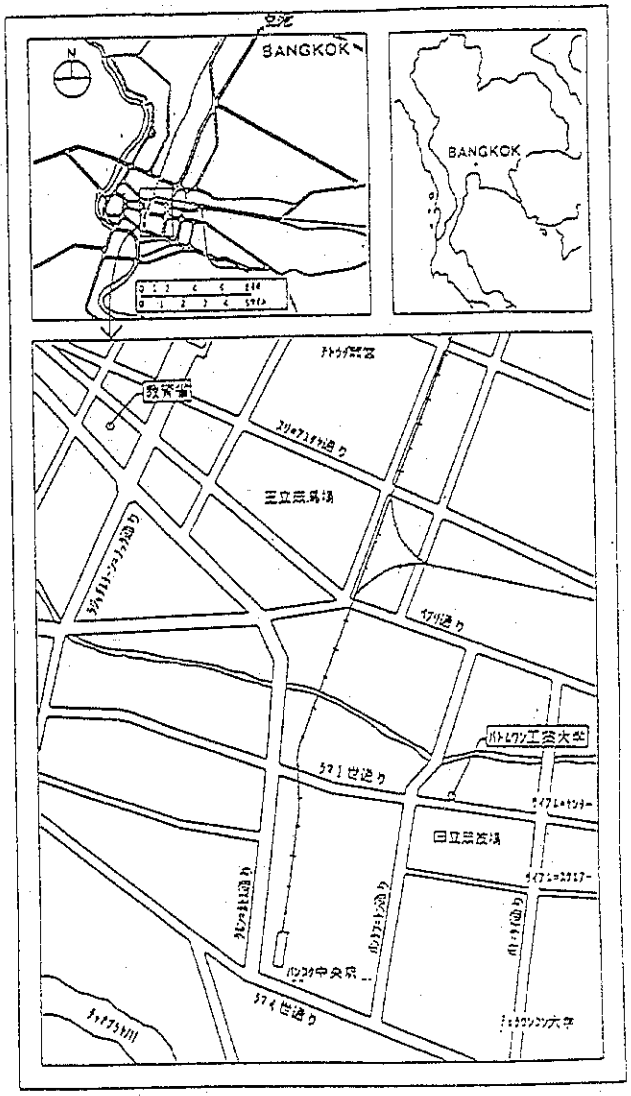
プロジェクト形成の経緯：

	1990	1991	1992	1993	～1998
無償	正式要請	○3月 基本設計調査 ○6月 ﾄﾗﾌﾄﾚﾎﾟｰﾄ 説明調査団 ○12月 E/N	○3月 機材調達開始	○3月 機材据付完了	
			○1月 基礎調査 ○8月 事前調査	○3月 実施協議 （R/D） ○4月 ﾌﾟﾛｼﾞｪｸﾄ開始 ○7月 ﾘｰﾀﾞｰ・調整員派遣	○3月 ﾌﾟﾛｼﾞｪｸﾄ終了

③　タイ国の教育制度

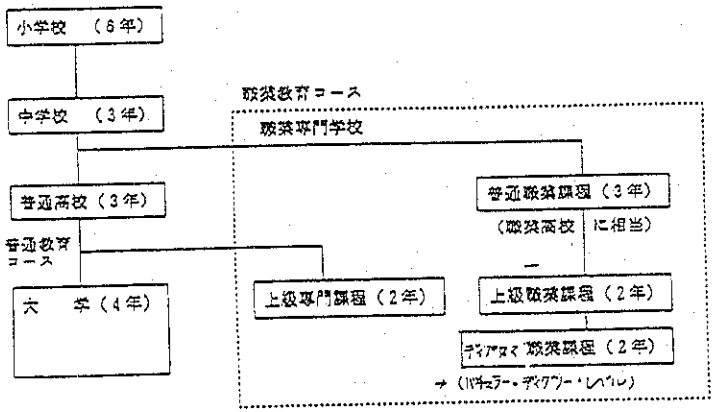


プロジェクトサイト



（参考）

タイ国の教育制度

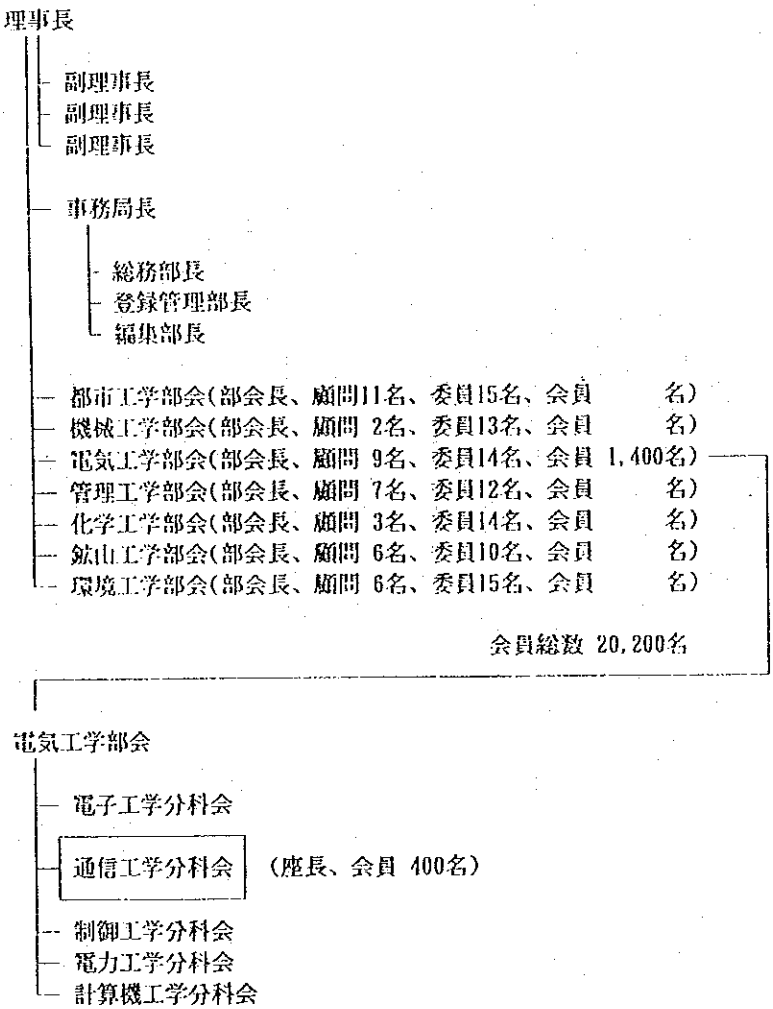


④ EITの組織

（平成4年9月、AIT電気通信：高橋謙三）

名称　The Engineering Institute of Thailand under H.M. The King's Patronage
王立タイ工学会
所在　チュラロンコン大学工学部内（クルンテープ、パヤタイ）
電話　252.6051、6052、251.2504、2506

組織



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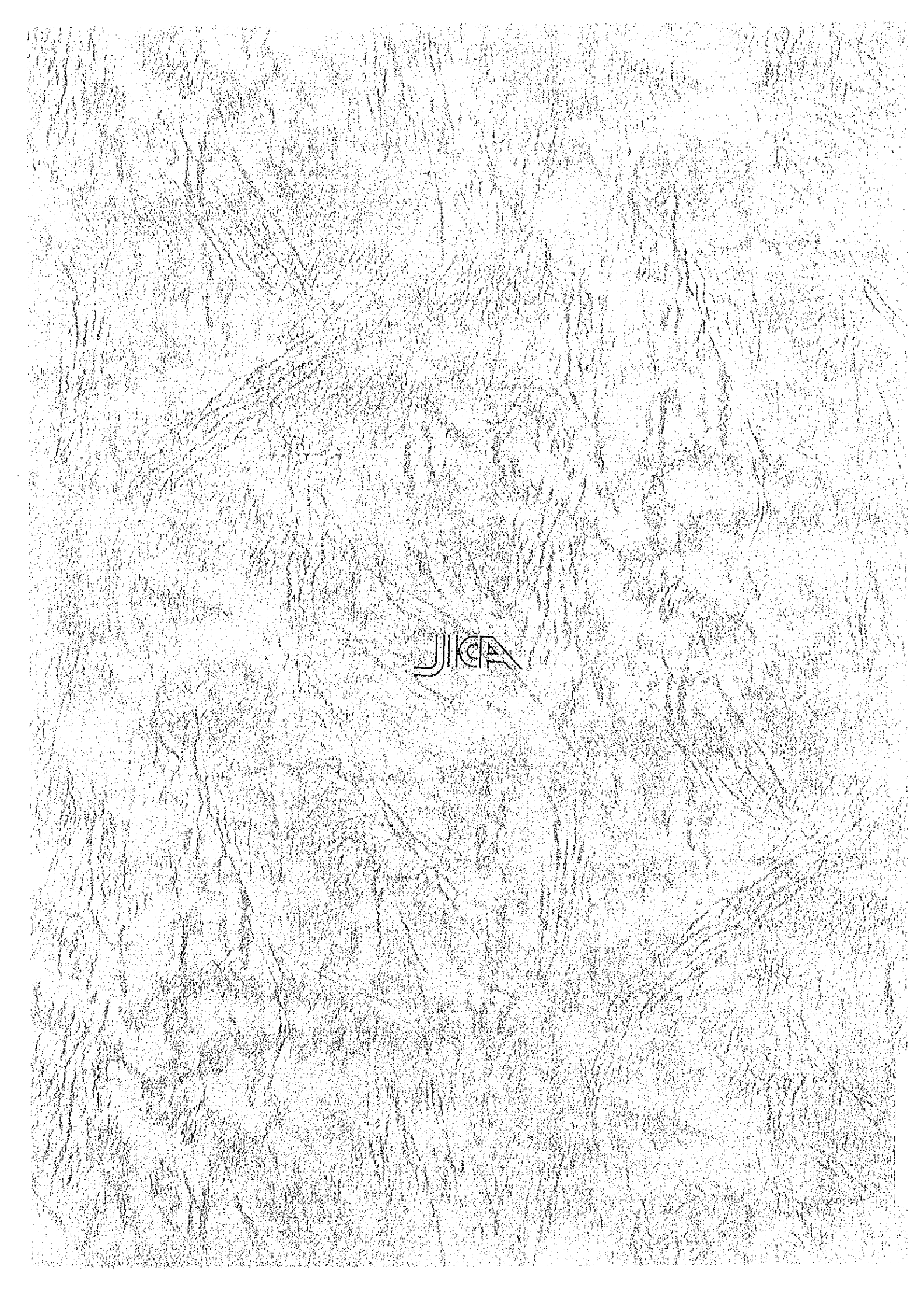
JICA