

วิทยาลัยวิชาการศึกษา



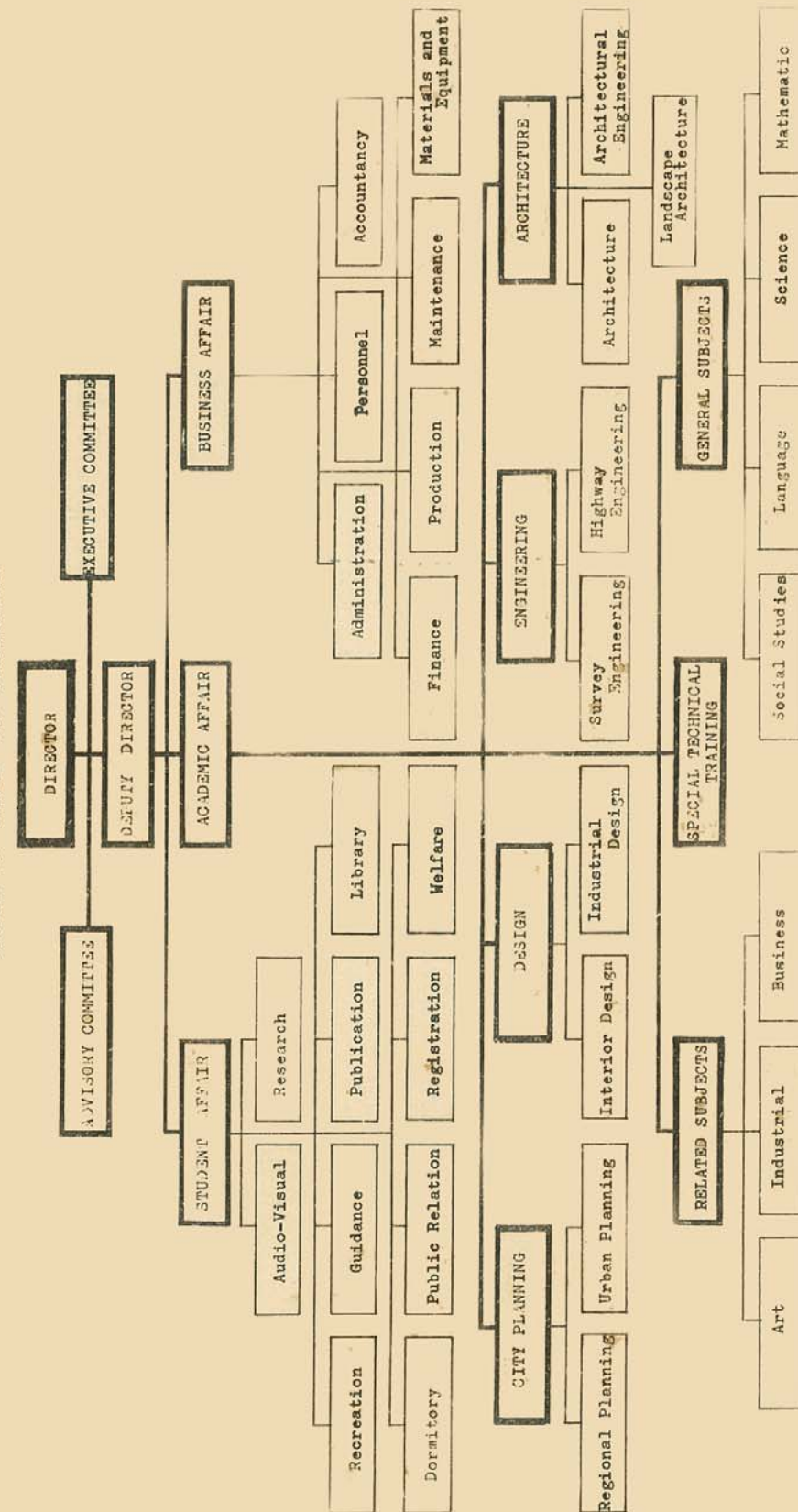
COLLEGE OF DESIGN AND CONSTRUCTION

วิทยาลัยวิชาการศึกษา



COLLEGE OF DESIGN AND CONSTRUCTION

ORGANIZATION CHART  
COLLEGE OF DESIGN AND CONSTRUCTION



ACADEMIT CALENDAR

First Semester

Registration Week	2nd Week of June
First Semester Begins	3rd Week of June
Subject Transfer	The end of June
Withdrawal	The end of July
Mid-examination Week	3rd Week of August
Final Examination	2nd Week of October
First Semester Ends.	3rd Week of October

Second Semester

Registration Week	2nd Week of November
Second Semester Begins	3rd Week of November
Subject Transfer	The end of November
Withdrawal	The end of December
Mid-examination Week	2nd Week of January
Final Examination Week	3rd Week of March
Second Semester Ends	The end of March

EXECUTIVE COMMITTEE.

Director  
Deputy Director  
Chief of Academic Affairs  
Chief of Student Affairs  
Four Qualified Staffs  
Chief of Administration

ADMINISTRATIVE STAFF

Prasom	Ransirochana	Director
Supreecha	Hirunro	Deputy Director
Charn	Arsai	
Prarop	Jantraphakdee	
Thonglaw	Swangrojn	
Anut	Suphachalat	
Tawat	Saysriyud	
Sayomporn	Umbhol	
Owat	Poolsiri	
Bubbha	Smitadilok	
Sriwan	Pradit	
Dawmanee	Rusmichareon	

Prelim. Draft.

COLLEGE OF DESIGN AND CONSTRUCTION.

The College of Design and Construction was the first institute of higher technical training to be established by the Department of Vocational Education in Thailand. Originally it was a school for the advanced training of designers and builders, but in 1963 the status of the school was raised to the level of a technical institute, with appropriate improvements in curricula and extensions of programs. At present, the College offers instruction at a three-year Diploma level in the fields of Architecture, Architectural Engineering, Landscape Architecture, Interior Design, Industrial Design, Highway Engineering, Survey Engineering, Regional Planning, Urban Design, and Special Vocational Studies. The various programs are administered under the jurisdiction of seven separate departments.

The rapid growth of the College in recent years reflected the urgent needs for technically trained personnel in the drive for a greater rate of economic growth and development of the country. These needs have been well recognized by the Government, and the expansion of the College was initiated and carried out as an integral part of the National Educational Development Plan.

REQUIREMENTS FOR ADMISSION.

An applicant must be a high school graduate and a holder of the Certificate of Education either in General Studies with a specialization in Science, or in Vocational Education. In addition he must satisfy the requirements of the National Entrance Examination administered annually by the National Education Board. He must also show evidence that he has sufficient financial support for the selected three-year study program at the College.

#### ADVANCED PLACEMENT.

Students of other institutes of higher technical training who wish to transfer to the same fields of specialization in the College of Design and Construction may do so by petitioning for advanced placement. An application will be considered only if the applicant has a minimum cumulative academic record of 3 points or 80 percent. After acceptance, the student must undergo a probationary period of one semester as a special student. If his progress is deemed satisfactory, the credits earned during the semester will be transferred to his regular program.

#### THE CERTIFICATE OF HIGHER VOCATIONAL EDUCATION.

After completing the six-semester program in the selected field of study and satisfying all the requirements of the minimum of 135 credit hours program, a candidate can be awarded the Certificate of Higher Vocational Education. The certificate is recognized by the Civil Service Commission as equivalent to a university diploma.

#### ATTENDANCE AND STUDY LOADS.

In each semester a student is expected to register for a maximum of 23 and a minimum of 12 credit hours. Any student who wishes to register for more than the prescribed maximum must obtain the permission of the Chief of Academic Affairs and the Chairman of the department of his major subject. Registration of less than 12 credit hours per semester is not permitted.

Generally, there are 35 hours of instruction a week, each hour representing 50 minutes of instruction. A student whose attendance in any subject is less than 80 percent of the instruction time will not be allowed to the final examination in that subject at the end of the semester.

#### COURSE REGISTRATION.

Students must register in person on the registration days specify in the Academic Calendar and file all course registration forms within the prescribed time limit. Students who are late in their registration must petition the Executive Committee of the College for special permission to register.

#### GRADES

Grades are given on the basis of the point system. The average passing grade for all subjects must be 2.00

A comparative chart of letters and points is given below.

	<u>Latter Grade</u>	<u>Point Grade</u>
Excellent	A	4.00
Good	B	3.00
Fair	C	2.00
Poor	D	1.00
Fail	F	0
Failed-short of attendance	Fa	0
Failed-absent from examination	Fe	0
Failed-withdrawal	Fw	0
Withdrawn	W	-
Incomplete	I	-

Students whose subject getting grade F. must re-register that subjects, or take another prescribed subject, and students whose subject getting grade D. may be permitted to regrade.

#### PRACTICAL EXPERIENCE.

Field trips and short periods of off-campus training are organized by the various departments of the College throughout the year. Students are expected to attend all these off-campus activities, and the grades obtained for the study reports submitted after each trip are an integral part of the semester grades.

In addition, every student must obtain, before graduation, at least three months of practical training in his major field by working in a government agency or a recognized private firm or organization. The student is responsible for obtaining the required training experience in the summer, but the College will do all it can to help in securing temporary appointments and summer jobs.

COURSES IN THE DEPARTMENT OF ARCHITECTURE.

Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Subjects
A.101	A.201	-	-	-	-	Graphics
A.102	A.202	A.302	A.402	A.502	A.602	Architecture
A.103	A.203	A.303	A.403	A.503	A.603	Building Technology
-	A.204	-	-	-	-	Building Materials
-	-	A.305	A.405	A.505	A.605	Structure
-	-	A.306	A.406	-	-	Services and Equipment

COURSES IN THE DEPARTMENT OF ENGINEERING.

E.101	E.201	-	-	-	-	Engineering Drawing
E.102	E.202	-	-	-	-	Highway Engineering
-	E.203	E.303	-	-	-	Highway Materials
-	-	E.304	E.404	E.504	E.604	Highway Design and Construction
-	-	E.305	-	-	-	Descriptive Geometry
-	-	E.306	E.406	-	-	Hydrology
-	-	-	-	E.507	E.607	Structure
E.108	E.208	E.308	E.408	-	-	Survey
-	-	-	E.409	-	-	Route Survey
-	-	-	-	E.510	-	Survey Computation
-	-	-	-	-	E.611	Electronic Survey
-	E.212	E.312	E.412	-	-	Astronomy
-	-	E.313	-	-	-	Mine Survey
-	-	E.314	-	-	-	Geology
-	-	-	E.415	E.515	-	Land Survey
-	-	-	-	E.516	-	Technical Instruments
-	-	-	-	E.517	E.617	Photogrammetry
-	-	-	-	-	E.618	Cartography
-	-	-	-	-	E.619	Map Projection
-	-	-	-	E.520	E.620	Geodesy
-	-	-	-	E.521	E.621	Transportation and Communication

COURSES IN THE DEPARTMENT OF DESIGN.

Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Subjects
D.101	D.201	-	-	-	-	Anatomy
D.102	D.202	D.302	D.402	D.502	D.602	Theory of Interior Design
-	D.203	D.303	D.403	-	-	Materials and Process
-	-	D.304	D.404	-	-	History of Furniture
-	-	D.305	D.405	D.505	D.605	Exhibition
D.106	D.206	D.306	D.406	-	-	Materials and Process
D.107	D.207	D.307	D.407	D.507	D.607	Theory of Industrial Design
D.108	D.208	D.308	D.408	D.508	D.608	Design Practice
-	-	D.309	D.409	D.509	D.609	Package Design
-	-	-	-	D.510	D.610	Industrial Design
D.111	D.211	D.311	D.411	D.511	D.611	Painting
D.112	D.212	D.312	D.412	D.512	D.612	Sculpture
-	D.213	-	-	-	-	Industrial Drawing
-	-	-	-	-	D.614	Estimates

COURSES IN THE DEPARTMENT OF GENERAL SUBJECTS

G.101	G.201	G.301	G.401	G.501	G.601	Language
G.102	G.202	-	-	-	-	Physics
G.103	-	-	-	-	-	Hygiene
G.104	G.204	G.304	-	-	-	Mathematics
-	-	G.305	-	-	-	Statistics
G.106	G.206	-	-	-	-	Chemistry

COURSES IN THE DEPARTMENT OF RELATED SUBJECTS.

Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Subjects
-	-	-	-	R.501	-	Organization and Management
-	-	-	-	R.502	R.602	Estimates and Specification
-	-	-	-	-	R.603	Marketing
R.104	R.204	-	-	-	-	Law and Land Registration
R.105	R.205	R.305	R.405	R.505	R.605	Humanity
-	-	-	R.406	R.506	R.606	City Planning
-	-	-	-	R.507	R.607	Landscape Architecture
R.108	R.208	-	-	-	-	Applied Mechanics
-	-	R.309	R.409	R.509	-	Strength of Materials
-	-	-	R.410	-	-	Soil Mechanics
-	-	-	R.411	-	-	Fluid Mechanics
-	-	R.312	R.412	R.512	R.612	Landscape gardening
-	-	-	-	R.513	R.613	Traffic Engineering and city planning
-	-	-	-	-	R.614	Highway estimates

REMARKS:

COURSE IDENTIFICATION.

A = Architecture

E = Engineering

D = Design

G = General Subjects

R = Related Subjects

First diget = Semester ( 1 - 6 )

Second and third diget = Subject number (01, 02, .....)

FACULTY STAFF.

DEPARTMENT OF ARCHITECTURE

Supa	Phasuk	B. Arch, Cert. in Ed.
Thianchai	Saratun	B.A. (Arch.) (Hons.)
Nualchun	Censarn	B.A. (Arch.)
Sayomporn	Umbhol	Dip. in Arch, B.Ed.
Kitti	Thipayaprasit	B.A. (Arch.) (Hons.)
Prasom	Ransirochana	B. Arch, M. Arch.
Supreecha	Hirunro	B. Arch., M.A. (Ind. Ed.)

SPECIAL LECTURERS.

Ruengsak	Kuntabut	B. Arch., M. Arch.
Wichai	Srisa-an	Dip. in Bldg. Cons.
Manas	Sterachinda	B. Eng.
Somnuk	Kulprapha	B. Eng., M. Eng.
Dr. Niwat	Daranant	B. Eng. (Hons.), D.I.C., Ph.D.
Chalitphakorn	Virabalin	B. Arch., M. Urban & Regional Planning.
Arporn	Juncharernsuk	B. Arch., M.R.P.

ARCHITECTURE DIVISION.

Objectives:

To enable the students to earn experiences and clear concepts of architectural design. They must have good morale, taste, and culture. The responsibility on their duties and society must be put in their minds as well as consideration of good problem solving. Architecture appreciation is their ideal.

ARCHITECTURAL ENGINEERING DIVISION.

Objectives:

To offer the students the high level engineering technology for create the contemporary architecture of which will be able to serve the society and to meet the economic situation. High rise structure and wide span structure should be stressed on their study. The students who want to take these subjects as the major courses should hold good cumulative records in mathematics and science. The graduates are able to assist architects and engineers through the architectural engineering projects.

ARCHITECTURE DIVISION.

Prescribed Subjects:

1. Graphics.
2. Architecture.
3. Building Technology.
4. Building Materials.
5. Structure.
6. Services and equipment.
7. Mathematics.
8. Statistics.
9. Language.
10. Applied Mechanics
11. Strength of Materials.
12. Organization and Management.
13. Estimates and Specification.
14. Humanity.
15. City Planning.
16. Landscape Architecture.
17. Office Practice.
18. Field Trip.

ARCHITECTURAL ENGINEERING DIVISION.

Prescribed Subjects.

1. Graphics.
2. Architecture.
3. Building Technology.
4. Building Materials.
5. Structure.
6. Services and Equipment.
7. Mathematics.
8. Statistics.
9. Language.
10. Applied Mechanics.
11. Strenght of Materials.
12. Soil Mechanics.
13. Fluid Mechanics.
14. Organization and Management.
15. Estimates and Specification.
16. Humanity.
17. City Planning.
18. Landscape Architecture.
19. Survey
20. Office Practice.
21. Field Trip.

ARCHITECTURE DIVISION.

Subjects	Semester 1		Semester 2		Semester 3		Semester 4		Semester 5		Semester 6	
	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.
G. 01 Language	3	-	3	-	3	-	3	-	3	-	3	-
G. 04 Mathematics	3	-	3	-	3	-	3	-	3	-	3	-
G. 05 Statistics	-	-	-	-	-	-	-	-	-	-	-	-
A. 01 Graphics	-	9	3	3	-	1	-	-	-	-	-	-
A. 02 Architecture	1	5	1	5	1	5	1	5	1	5	1	5
A. 03 Building Technology	1	5	1	5	1	5	1	5	1	5	1	5
A. 04 Building Materials	-	-	-	-	-	-	-	-	-	-	-	-
A. 05 Structure	-	-	-	-	-	-	-	-	-	-	-	-
A. 06 Services and Equipments	-	-	-	-	-	-	-	-	-	-	-	-
R. 01 Organization and Management	-	-	-	-	-	-	-	-	-	-	-	-
R. 02 Estimates and Specification	-	-	-	-	-	-	-	-	-	-	-	-
R. 05 Humanity	-	6	-	6	-	1	-	1	-	1	-	1
R. 06 City Planning	-	-	-	-	-	-	-	-	-	-	-	-
R. 07 Landscape Architecture	-	-	-	-	-	-	-	-	-	-	-	-
R. 08 Applied Mechanics	2	-	2	-	2	-	2	-	2	-	2	-
R. 09 Strength of Materials	-	-	-	-	-	-	-	-	-	-	-	-

Note : lt. = lecture/hrs.  
st. = studio/hrs.  
cr. = credits.

A. 101 GRAPHICS.

Drawing.

1. Introduction.
2. To know how to use drawing instruments.
3. Free hand sketch.
4. Symbols & lines.
5. Principle of drawing, dimension and scales.
6. Lettering.
7. Practice drawing geometric forms.

Graphics.

1. Introduction.
2. Objectives and utilizations.
3. Principle of drafting and understanding.
4. Basic landscaping and site work:
  - a. Trees & shrubs.
  - b. Pavings for paths, terraces and roads.
  - c. Car sizes, roads, parking.
  - d. Study and draft the whole site plan.

A. 201 GRAPHICS.

Drawing.

1. Introduction to plans, elevations, sections and how to draft.
2. Isometric.
3. Oblique.
4. Shades & shadows.
5. Perspectives.

Graphics.

1. Study dimension of furniture, accessories, equipment and space.
2. Requirements for plans:
  - a. Residential planning.
  - b. Commercial planning.
  - c. Public planning.
  - d. How to apply to design.

ARCHITECTURAL ENGINEERING DIVISION.

Subjects	Semester 1		Semester 2		Semester 3		Semester 4		Semester 5		Semester 6	
	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.
G. 01 Language	3	-	3	3	3	-	3	-	3	-	3	-
G. 02 Physics	3	-	3	3	3	-	3	-	3	-	3	-
G. 04 Mathematics	3	-	3	3	3	-	3	-	3	-	3	-
G. 05 Statistics	3	-	3	3	3	-	3	-	3	-	3	-
G. 06 Chemistry	3	-	3	3	3	-	3	-	3	-	3	-
E. 08 Survey	2	3	2	3	2	3	2	3	2	3	2	3
A. 01 Graphics	-	3	-	3	-	3	-	3	-	3	-	3
A. 02 Architecture	-	3	-	3	-	3	-	3	-	3	-	3
A. 03 Building Technology	-	3	-	3	-	3	-	3	-	3	-	3
A. 04 Building Materials	-	3	-	3	-	3	-	3	-	3	-	3
A. 05 Structure	-	3	-	3	-	3	-	3	-	3	-	3
A. 06 Services and Equipment	-	3	-	3	-	3	-	3	-	3	-	3
R. 01 Organization and Management	-	3	-	3	-	3	-	3	-	3	-	3
R. 02 Estimates and Specification	-	3	-	3	-	3	-	3	-	3	-	3
R. 05 Humanity	-	3	-	3	-	3	-	3	-	3	-	3
R. 06 City Planning	-	3	-	3	-	3	-	3	-	3	-	3
R. 07 Landscape Architecture	-	3	-	3	-	3	-	3	-	3	-	3
R. 08 Applied Mechanics	-	3	-	3	-	3	-	3	-	3	-	3
R. 09 Strength of Materials	-	3	-	3	-	3	-	3	-	3	-	3
R. 10 Soil Mechanics	-	3	-	3	-	3	-	3	-	3	-	3
R. 11 Fluid Mechanics	-	3	-	3	-	3	-	3	-	3	-	3

Note : lt. = lecture/hrs.  
st. = studio/hrs.  
cr. = credits.

A. 102 ARCHITECTURE.

1. Introduction.
2. The meanings of architecture.
3. The needs of architecture.
4. Fundamental factors and principle of design.

A. 202 ARCHITECTURE.

1. Functions, how forms follow functions, structure, construction, and materials Surroundings, environments, organic design, orientation, geographical locations.

A. 302 ARCHITECTURE.

1. Advanced content of course number A. 202
2. Development of architecture characteristics.

A. 402 ARCHITECTURE.

1. Influence of the contemporary society to architecture.
2. The coordination of building design and the new material production methods as well as the technological advancement.

A. 502 ARCHITECTURE.

1. Principles of philosophy and the concepts of the world great architects.
2. Development of Thai architecture and the influence of the contemporary society to architecture especially in Thailand.
3. Student's own individual philosophy of design, criticism.

A. 602 ARCHITECTURE.

1. Student's own individual research project in architecture submitted to the jury for the final decision.

A. 103 BUILDING TECHNOLOGY.

1. History of construction.
2. Mean sea level, sunlight, wind, rain, and moisture.
3. Subsurface materials.
4. Piles.
5. Footings and foundations.
6. Wood construction.
7. Principle of construction drawing and material symbols.
8. Wooden house drawing.

A. 203 BUILDING TECHNOLOGY.

1. Wall bearing construction.
2. Masonry construction, reinforced masonry construction.
3. Masonry arches, and dome.
4. Floor construction on or near ground.
5. Toilets.
6. Wooden house drawing.
7. Masonry construction drawing.

A. 303 BUILDING TECHNOLOGY.

1. Partitions, doors and windows.
2. Roof structure.
3. Drainage and plumbing.
4. Various types of stairs.
5. Drawing details of partitions, doors and windows.
6. Drawing roof structure.
7. Drawing types of stairs.

A. 103 BUILDING TECHNOLOGY.

1. History of construction.
2. Mean sea level, sunlight, wind, rain, and moisture.
3. Subsurface materials.
4. Piles.
5. Footings and foundations.
6. Wood construction.
7. Principle of construction drawing and material symbols.
8. Wooden house drawing.

A. 203 BUILDING TECHNOLOGY.

1. Wall bearing construction.
2. Masonry construction, reinforced masonry construction.
3. Masonry arches, and dome.
4. Floor construction on or near ground.
5. Toilets.
6. Wooden house drawing.
7. Masonry construction drawing.

A. 303 BUILDING TECHNOLOGY.

1. Partitions, doors and windows.
2. Roof structure.
3. Drainage and plumbing.
4. Various types of stairs.
5. Drawing details of partitions, doors and windows.
6. Drawing roof structure.
7. Drawing types of stairs.

A. 403 BUILDING TECHNOLOGY.

1. Short span of reinforced concrete design.
2. Reinforced concrete flat roof systems.
3. Basement and damp proof course.
4. Big wooden house drawing.
5. Short span reinforced concrete construction drawing.

A. 503 BUILDING TECHNOLOGY.

1. Long span of reinforced concrete design.
2. Concrete rigid frames, shells, arches and dome.
3. Wide span design for wood girders, trusses, arches, dome, and rigid frames.
4. Mechanic equipment for buildings.
5. Heavy design of reinforced concrete.

A. 603 BUILDING TECHNOLOGY.

1. Short span design for structural steel framing.
2. Long span design for structural steel framing.
3. Prefabrication.
4. Steel framing drawing.
5. Heavy design construction drawing.

A. 204 BUILDING MATERIALS.

1. Wood.
2. Concrete, reinforced concrete, mortar and plaster.
3. Steel.
4. Foundation, floor, partition, ceiling and roof materials.
5. Acoustic materials.
6. Building construction equipment.

A. 305 STRUCTURE.

1. Reaction of supports, shear and moment due to dead load of structure.
2. Reactions, shear and moment due to live load of structure.

A. 405 STRUCTURE.

1. Analysis of roof truss, bridge, by graphical method.
2. Design of timber and steel structure.

A. 505 STRUCTURE.

1. Design of reinforced concrete members, beam, slab, column, footing by elastic theory.
2. Analysis of reinforced concrete building and bridges.

A. 605 STRUCTURE.

1. Analysis of structures by method of slope deflection and moment distribution.
2. Elementary theory of prestressed concrete.

A. 306 SERVICES AND EQUIPMENT.

Water supply.

1. Water pump working system.
2. Water distribution.
3. Water control.
4. Plumbing and accessories.
5. Toilet fixtures.
6. Sizes of pipe diameter.
7. Warm water.

Insulation.

1. Heat transfer.
2. Ventilation methods: Natural and artificial.
2. Air conditioning: System and installation.

A. 406 SERVICES AND EQUIPMENT.

Electricity.

1. System.
2. Installation.
3. Safety.
4. Illumination.
5. Symbols and drawing.

Sound.

1. Acoustic system.
2. Acoustic absorbers.
3. Electronic instrument installation in building.
4. Sound problems solving.

Introduction to elevator, escalator etc.

FACULTY STAFFDEPARTMENT OF ENGINEERING

Prayut	Wongpratoom	B. Eng., M. Eng.
Vichai	Boonjamalik	B.A. (Arch.)
Vichian	Suwanarat	B.A. (Arch.) (Hons.)
Kitti	Tipprasit	B.A. (Arch.) (Hons.)
Thonglaw	Swangrojn	Dip. in Bldg. Cons. (Tech.)
Owat	Pool Siri	Dip. in Bldg. Cons., B.Ed.

SPECIAL LECTURERS

Chadab	Patamasut	B. Eng. (Hons.), Dip. in Ed., M.Sc. Eng.
Phaisal	Vadhanasindhu	B. Eng. (Hons.), Dip. in Ed., M.S. in C.E.
Sathien	Chalashiva	B. Eng. (Hons.), M.Eng., Cert. in Engineering Hydrology
Meechai	Chaisrakao	B. Eng. (Hons.), M.Sc.
Yos	Laksanakoses	B. Eng., M. Eng.
Sukri	Kumpananond	B. Eng., M.S. in C.E.
Dr. Manu	Weeraburus	B. Eng., M.S., Ph.D.
Silpachai	Kummeesak	B. Eng., M. Eng.
Thaworn	Kaeoyana	B. Eng.
Sukree	Dheeragool	B. Eng., M.S. C.E.
Manas	Asananandh	Dip. in Surveying
Sakda	punyananta	B. Eng., M. Eng.
Sukhum	Junhaman	B. Eng.
Somwang	Tantalak	B. Eng., Cert. in Survey Photogram
Prapussorn	Khochaphoom	B. Eng. (Hons.), M.Eng.
Surasak	Sorapetpisai	I.T.C. Dip. of Photogrammetry Engineer
Somboon	Chalernchit	L.L.B.
Thamnoon	Udomsorayut	Cert. in Military Map., Instrument Eng.
Sompun	Krutnart	I.T.C. Dip. of Photogrammetry Engineer
Methee	Vudhiyangkul	Cert. in Ed., L.L.B., Dip. in Marketing & Transportation

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HIGHWAY ENGINEERING DIVISION.Objectives:

South east Asia countries are developing. This part of the world is short of connecting roads to fertile lands. Highway construction is the urgent need in order to contribute facilities and to eliminate time consuming in communication. The graduates, undoubtedly, will be able to cooperate with the highway engineers to fulfill this demand of our nation.

SURVEY ENGINEERING DIVISION.Objectives:

Transportation projects, urban renewal planning, land use program, irrigation for land development, and natural resource exploration including the land title deed for the whole country need thousand of surveyors a year. Many institutions have been launched surveyors only hundred annually. Our well trained graduates holding high level of technology are able to help our country a great deal.

# HIGHWAY ENGINEERING DIVISION

Subjects	Semester 1		Semester 2		Semester 3		Semester 4		Semester 5		Semester 6	
	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.
G. 01 Language	3		3		3		3		3		3	
G. 02 Physics	3		3		3		3		3		3	
G. 03 Hygiene	1		1		1		1		1		1	
G. 04 Mathematics	3		3		3		3		3		3	
G. 05 Statistics	-		-		-		-		-		-	
E. 01 Engineering Drawing	-		6		2		3		3		3	
E. 02 Highway Engineering	2		3		3		3		3		3	
E. 03 Highway Materials	-		-		-		-		-		-	
E. 04 Highway Design and Construction	-		-		-		-		-		-	
E. 05 Descriptive Geometry	-		-		-		-		-		-	
E. 06 Hydrology	-		-		-		-		-		-	
E. 07 Structure	-		-		-		-		-		-	
E. 08 Survey	2		3		3		3		3		3	
E. 09 Route Survey	-		-		-		-		-		-	
E. 14 Geology	-		-		-		-		-		-	
E. 17 Photogrammetry	-		-		-		-		-		-	
E. 21 Transportation and Communication	-		-		-		-		-		-	
R. 01 Organization and Management	-		-		-		-		-		-	
R. 05 Humanity	-		6		2		3		3		3	
R. 07 Landscape Architecture	-		-		-		-		-		-	
R. 08 Applied Mechanics	2		2		2		2		2		2	
R. 09 Strength of Materials	-		-		-		-		-		-	
R. 10 Soil Mechanics	-		-		-		-		-		-	
R. 11 Fluid Mechanics	-		-		-		-		-		-	
R. 13 Traffic Engineering and City Planning	-		-		-		-		-		-	
R. 14 Highway Estimate	-		-		-		-		-		-	

Note : lt. = lecture/hrs.

## HIGHWAY ENGINEERING DIVISION.

### Prescribed Subjects.

Engineering Drawing  
 Mathematics  
 Statistics  
 Physics  
 Language  
 Humanity  
 Hygiene  
 Applied Mechanics  
 Survey  
 Highway Engineering  
 Highway Materials  
 Highway Design and Construction  
 Descriptive Geometry  
 Hydrology  
 Geology  
 Route Survey  
 Strength of Materials  
 Soil Mechanics  
 Fluid Mechanics  
 Structure  
 Photogrammetry  
 Landscape Architecture  
 Communication and Transportation  
 Organization and Management  
 Highway Estimates  
 Traffic Engineering  
 Office Practice  
 Camp Work

SURVEY ENGINEERING DIVISION.

Prescribed Subjects.

Engineering Drawing  
Mathematics  
Statistics  
Physics  
Language  
Humanity  
Hygiene  
Survey  
Highway Engineering  
Astronomy  
Hydrology  
Mine Survey  
Descriptive Geometry  
Geology  
Route Survey  
Survey Computation  
Soil Mechanics  
Technical Instruments  
Geodesy  
Photogrammetry  
Cartography  
Map Projection  
Electronic Survey  
Landscape Architecture  
Law and Land Registration  
Land Survey  
Traffic Engineering  
Office Practice  
Camp Work

SURVEY ENGINEERING DIVISION

Subjects	Semester 1			Semester 2			Semester 3			Semester 4			Semester 5			Semester 6		
	lt.	st.	cr.	lt.	st.	cr.	lt.	st.	cr.	lt.	st.	cr.	lt.	st.	cr.	lt.	st.	cr.
G. 01 Language	3	3	1	-	-	-	3	3	1	-	-	-	3	3	1	-	-	-
G. 02 Physics	3	3	1	-	-	-	3	3	1	-	-	-	3	3	1	-	-	-
G. 03 Hygiene	3	3	1	-	-	-	3	3	1	-	-	-	3	3	1	-	-	-
G. 04 Mathematics	3	3	1	-	-	-	3	3	1	-	-	-	3	3	1	-	-	-
G. 05 Statistics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 01 Engineering Drawing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 02 Highway Engineering	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 05 Descriptive Geometry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 06 Hydrology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 08 Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 09 Route Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 10 Survey Computation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 11 Electronic Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 12 Astronomy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 13 Mine Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 14 Geology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 15 Land Survey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 16 Technical Instruments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 17 Photogrammetry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 18 Cartography	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 19 Map Projection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. 20 Geodesy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 01 Organization and Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 04 Law and Land Registration	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 05 Humanity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 07 Landscape Architecture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 08 Applied Mechanics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 10 Soil Mechanics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. 13 Traffic Engineer and City Planning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note : lt. = lecture/hrs.  
st. = studio/hrs.  
cr. = credits

E. 101 ENGINEERING DRAWING.

1. The selection of instruments.
2. The use of instruments.
3. Lettering.
4. Applied geometry.
5. The theory of projection drawing.
6. Orthographic projection.
7. Auxiliary views.
8. Section and conventions.

E. 201 ENGINEERING DRAWING.

1. Dimensions and notes.
2. The dimensions of machine drawing.
3. Bolts ~~screws~~, keys, rivets, and springs.
4. Piping drawing.
5. Perspective drawing.
6. The elements of structural drawing.
7. Map and topographic drawing.

E. 313 MINE SURVEY

Survey of Mining claims, Various means of carrying the meridian, underground; Survey of shafts, raises, and slopes; Mine Mapping borehold survey.

E. 102 HIGHWAY ENGINEERING

Introduction, highway engineering in general, highway definitions, highway system and organization, elements of cross sections, highway classifications, highway planning, highway economy, traffic engineering.

E. 202 HIGHWAY ENGINEERING.

Highway surveys, plans and profiles, elements of horizontal and vertical curves, earth work computations, the mass diagram, highway equipment and their operations.

E. 203 HIGHWAY MATERIALS.

Standard Specifications For Highway Material.

1. Soils - Terms Relating to Subgrade, Soil - Aggregate, and Fill  
Materials Classification of Soils and Soil Aggregate Mixtures for Highway Construction purposes.
2. Aggregate - Materials for Soil - Aggregate Subbase, Base and Surface Courses. Materials for Embankments and Subgrades  
Granular Materials to control pumping under concrete pavement.  
Fine Aggregate for portland Cement concrete.
  - a. Motor Sand.
  - b. Sand for Bituminous Mixtures.
  - c. Crushed Stone and Crushed slag for Base Course.
  - d. Crushed Stone and Crushed for Bituminous Concrete Base Course.
  - e. Crushed Stone and Crushed Slag for Water bound surface course.
  - f. Crushed Stone and Crushed slag for Bituminous.
  - g. Macada surface course.
  - h. Crushed Stone and Crushed slag for Bituminous concrete surface Course.
  - i. Coarse Aggregate for Portland Cement concrete.
  - j. Standard sizes for Coarse Aggregate for Highway Construction.
3. Expansion joint fillers.
  - a. Performed Expansion joint filler for concrete (Bituminous type)
  - b. Performed Expansion joint filler for Concrete.
  - c. Mixed Asphalt and Mineral filler.

Soil Stabilization.

1. To study the various types of Soil Stabilization, such as
  - a. Mechanical Stabilization.

b. Lime Stabilization.

c. Soil Cement Stabilization.

Method Of Sampling And Testing.

1. Sampling stone, slag, gravel, sand for use as Highway Materials.
2. Abrasion of Coarse Aggregate by use of the Losangeles Machine.
3. Sieve Analysis of Fine and Coarse Aggregate.
4. Sieve Analysis of mineral Filter.
5. Mechanical Analysis of Extracted Aggregates.
6. Specific Gravity and Absorption of
  - a. Fine Aggregate.
  - b. Coarse Aggregate.
7. Unit weight of Aggregate.
8. Void in Aggregate.
9. Organic Impurities in Sand.
10. Clay Lumps in Aggregates
11. Soundness of Aggregates by Use of Sodium Sulfate of Magnesium Sulfate
12. Soundness of Aggregates by Freezing and Thawing.

E. 303 HIGHWAY MATERIALS.

Standard Specifications For Bituminous Materials.

1. Asphalt Cement.
2. Emulsified Asphalt.
3. Cut - Back Asphalt (Rapid curing and Medium curing types)
4. Asphalt for Damproofing and Water-proofing.
5. Bituminous Mixing plant requirements.
6. Oil Asphalt Filler.

To Study The Various Types of asphalt Pavements.

1. Petroleum Asphalts, Mineral Aggregates, including the Design of Asphalts Concrete, and Combining of Aggregates to produce a specified grading.

Method of Testing and Mix-Design.

1. Preparation of Asphalt Cement for Testing.
2. Flash point by Means of Open Cup.
3. Penetration of Bituminous Materials.
4. Loss on heating of an Asphaltic Compounds.
5. Ductility of Bituminous Materials.
6. Softening Point of Bituminous Materials by the Ring and Ball Method.
7. Solubility in Carbon Tetrachloride.
8. Spot test of Asphaltic Materials.
9. Flash Point with Tagliabue open cup.
10. Distillation of Cut back Asphaltic Products.
11. Viscosity by means of Saybolt Viscosimeter.
12. Float Test of Bituminous Materials.

Mix-design Methods.

1. Marshall Method of Mix design.
2. Hveem Method of Mix design.

E. 305 DESCRIPTIVE GEOMETRY.

1. Abbreviation, relation, representation of point, line and plane, intersections and developments.

E. 304 HIGHWAY DESIGN AND CONSTRUCTION.

1. Geometric design of highways, design control and criteria, design speed, horizontal alignment, vertical alignment, cross section, intersection.
2. Job planning and management, equipment and their uses.
3. Drainage and drainage structures, rain fall and run-off, pipe and box culverts, drainage dikes and gutters, bridges, intercepting ditches, sub drain.

E. 404 HIGHWAY DESIGN AND CONSTRUCTION.

1. Bituminous materials and their uses, production types, tests, mineral aggregates or road stones, bituminous mix design, types of surfacing.
2. Pavement design, theories of pavement design, methods of design of rigid and flexible pavements, practical consideration of materials.

E. 504 HIGHWAY DESIGN AND CONSTRUCTION.

1. Bituminous surfaces.
2. Function of the surface.
3. Types of bituminous materials.
4. Surface treatments.
5. Road mixes.
6. Penetration macadam.
7. Bituminous base.
8. Portland cement concrete.

E. 604 HIGHWAY DESIGN AND CONSTRUCTION.

1. Bases for rigid pavement design.
2. Bases and subbases for flexible pavement design and construction.
3. Principle of highway maintenance.
4. Airport pavement and design.

E. 306 HYDROLOGY.

1. Fundamental consideration.
2. Circulation and causes of circulation of water.
3. Effect of circulation of water in engineering works.
4. Atmospheric temperature and pressure, wind and storm.
5. Evaporation and factors of evaporation.
6. Transpiration.
7. Monsoon, Typhoon \_ Cyclones.

8. Precipitation & causes of rain fall.
9. Types of rain fall.
10. Distribution of rain fall.
11. Measurement of rain fall, rain gauge & recording of rain fall.
12. Flood and flood discharge.
13. Calculation of flood discharge by:-
  - a. Water surface slope.
  - b. Floats and,
  - c. Current meters, measuring velocity of water.
14. Hydrograph and rating curves.

E. 406 HYDROLOGY.

1. Methods of river training.
2. Construction works in waterways.
3. Training walls, groynes.
4. Cut-off and some important considerations for making cut-offs.
5. Earth-dams.
6. Earth excavation works for construction of embankments and water-ways.
7. Water erosion and scour in water-ways and protections.

E. 507 STRUCTURE.

1. Reactions, shear and moment due to dead load of structure.
2. Reaction, compression and tension in member of structure by graphical method.
3. Analysis of building structure.
4. Reaction, shear, moment due to live load.
5. Design and analysis of timber and steel structures.
6. Design of reinforced concrete members.

E. 607 STRUCTURE.

1. Deflection and settlement of beams and structures.
2. Design and analysis of building structures.
3. Design of bridge structure, piers and abutments.
4. Structural laboratory and model analysis.

E. 510 SURVEY COMPUTATION.

Method of least squares as applied to various adjustments of observation in geodetic triangulation, precise traverse and geodetic levelling. Computation of geodetic and astronomic position. This course is designed to establish skill in numerical work and knowledge of computation methods including styles, and layouts of the computation, accuracy, matress, speed, arithmatical checks, suitability of formula, logarithms and machine computations.

E. 611 ELECTRONIC SURVEYING.

The introduction to electronic surveying. Fundamentals of radio techniques and radio location, general operation, transmitter, receiver and antennas, Electronic surveying method including geodimeter, tellurometer, the corrections and analysis Aerrors and their applications.

E. 409 ROUTE SURVEY

The preliminary and location surveys for route layouts. Curve ranging for horizontal curves (Circular and transition curves), and vertical curves, Some factors governing the design and field staking of the curves. Road profit, cross-sectioning, staking the sections, excavation and embankment, and computation of earth volume for the preliminary estimate and for the construction purpose and the use of the mass diagram.

Preliminary surveys for construction works. Route study from the existing maps and aerial photographs.

E. 108 SURVEYING.

Basic field methods of plane surveying, chain surveying, compute surveying, choice of station and chain lines, making and interpreting entries in the field books. Map scales and corresponding conventional signs. The simple sources of errors, permissible errors and simple adjustment of figures. Plane coordinate computation from the data of magnetic surveying. Calculations of areas and volumes

the plannimeters.

E. 208 SURVEYING.

The principles and practice of spirit levelling the knowledge of the simple types of the levels (Dumpy and tilting levels) and their adjustments staffs, making and interpreting entries in the field books, reduction of field observation interpotation of large scale contours, simple sources of errors and permissible errors. The principles of altimating.

E. 308 SURVEYING.

Optical and mechanical principles, adjustment and employment of theodolites, relation precision of the instruments, the sextants, the principles and practice of traversing, including surface taping, precautions against gross errors, sources of errors of observation and computations including simple methods of adjustment, tacheometry control for plane table at topographic scales. Plane table surveys at topographic scales, the plotting of grid graticules and control points, detail surveying and topographic surveying. Computation and fair drawing of topographic mass.

E. 408 SURVEYING.

Control air survey minor triangulation, intersection and resection by direct and indirect and semigraphic methods, trigonometric levelling. Hydrographic surveying including the control for detail survey ashore, instruments for sounding locating the position afloat plotting and method of sounding. Office work of the surveying data from surveying camp.

E. 212 ASTRONOMY.

Heavenly bodies, the earth as an astronomical body, the moon, the celestial sphere apparent path of the sun, the moon and planets among the stars, constellations, magnitude of stars, units of angular

measurement, Spherical triangle, astronomical triangle, solution of spherical triangle. The astronomical systems of coordinate.

E. 312 ASTRONOMY

Time and longitude, measurement of time, sidereal time, apparent time, civil time, equation of time, relation between civil time and sidereal time, right ascension of any heavenly bodies, relation between time and longitude hour angle and longitude, standard time and zone time. Nautical almanace and its use. Conversion of time; coorections to observation. Instruments, Determination of time, Latitude, Longitude and azimuth.

E. 412 ASTRONOMY

Precise determination of azimuth, time longitude and latitude.

E. 314 GEOLOGY

1. Introduction to geology.
2. Rocks and minerals.
3. Rocks as construction materials.
4. Physical geology.
5. Structural geology.
6. Geology of highway construction.
7. Geology of earth foundation.
8. Geology of water supply.

E. 415 } LAND SURVEY.

Land Office's Survey.

1. The advantages of Mapping.
2. Traverse Networks with various kinds of instruments.
3. Scales and Cadastral Mapsheets.
4. Traverse Network for Cadastral Mapping.
5. Detail Survey Mapping, Local Cadastral Survey Mapping, Aerial Cadastral Survey Mapping.

E. 515 LAND SURVEY

1. Land Office's Cadastral Survey.
2. Rules and Regulations concerning Cadastral Survey.
3. Boundary Investigation.
4. Land Office's Cadastral Survey with various kinds of instruments.
5. Map's Plotting.
6. Map's copying and enlarging.
7. Field's practice.

E. 619 MAP PROJECTIONS.

Representation of the sphere on the plane; scale and scale error; distortion of angle and area; orthomorphic (conformal) projections; derivation of transformation formulae for the Cassini, Lambert, Conical orthomorphic and transverse mercator projections; computation in the plane rectangular coordinates.

E. 516 TECHNICAL INSTRUMENT

Surveyor's compass, test, adjustment and its use. Geodetic and photogrammetric instruments, their functions, errors and adjustments:- theodolite, levels, electronic measuring distance equipments (Tellurometer and geodimeter), plotting instruments and cameras.

E. 517 PHOTOGRAMMETRY

Introduction to photogrammetry.

1. The meaning of photogrammetry.
2. Basic principle of stereo photogrammetry.
3. Application of photogrammetry.
4. History of its development.

Aerial camera and accessories.

1. Introduction.
2. Simple optical system.
3. Aerial camera lens
4. Compensation of lens distortion.
5. Camera parts and accessories.
6. Type of aerial camera.
7. Principle of camera calibration.

Aerial photography.

1. Type of aerial photogrammetry.
2. Factors affecting photogrammetry.
3. Instrument for aerial photogrammetry.
4. Air plane and flight personnel.
5. General instruction for aerial photogrammetry.
6. Laboratory processing.

Photogrammetry theory.

1. Scale, focal length and flying height.
2. Relief displacement.
3. The theory of flight planning.
4. Parallax and elevation.
5. Rectification.

E. 617 PHOTOGRAMMETRY.

Stereoscope.

1. Principle of vision.
2. Direct and indirect stereoscopic vision.
3. Aids in stereoscopic viewing of image pairs.
4. The principle of floating mark.

Photogrammetric plotting instrument.

1. Introduction.
2. Monocular and single photo instrument.
3. Stereoscopic plotting instrument.

Topographic map.

1. Introduction.
2. Control of photogrammetric map.
3. Photographic interpretation.
4. Topographic map with photogrammetric plotting machine.

Terrestrial photogrammetry.

1. Theory of single image measurement.
2. Theory of double image measurement.

E. 618 PHOTOGRAMMETRY IN PRACTICE AND CARTOGRAPHY.

General of photogrammetry.

1. Purpose of photogrammetry.
2. Computation of aerial photography for mapping.
3. Operation of stereoscope.
4. Stereoscopic parallax.

Compilation of aerial photography in various types.

1. Mosaic construction.
2. Control mosaic.
3. Uncontrol mosaic.
4. Contouring by parallax bar.
5. Contouring by interpolation.
6. Mapping by Px and Py.

7. Computation of differential, parallax  $Sp = \frac{bh}{H - h}$

Map compilation.

1. Determination of minor control points.
2. Radial triangulation.
3. Spatial triangulation.
4. Compilation from various instrument.
5. Approximate instrument.
6. Stereo instrument.
7. Compilation from binocular vision.

Photo interpretation.

1. Introduction.
2. Value of photo interpretation.
3. Application for civil purpose.
4. Application for military purpose.
5. Field survey classification.
6. Application of mapping symbols.

Rectification.

1. Graphical rectification.
2. Geometry of rectifier.
3. Rectifying equipment and operation.

Orientation.

1. Interior orientation.
2. Relative orientation.
3. Absolute orientation.
4. Theory of instrument.

Uses of photogrammetry.

1. Military.
2. Irrigation.
3. Cadastral.
4. Geology
5. Highway
6. Construction.
7. Compilation of data.

Cartography.

1. Introduction and classification of maps.
2. Cartographic generalization, exaggeration and symbolization.
3. The geometrical aspects of maps.
4. The representation of topography.
5. The essentials of the representation of relief.
6. Map drawing.
7. Map lettering and symbolization.
8. Photo mechanical representation.

E. 520

GEODESY.

The shape and size of the earth including the vertical and horizon control of closed circuits of traverses and triangulations.

1. Definition of geodesy.
2. The aim to study geodesy.

Features of the earth.

Feature on the surface of the earth, true shape of the earth or geoid.

Feature or shape of sphere according to geometrical condition, element of computing the sphere, the true shape of the earth is oblated sphereoid of ellipsoid.

1. Radii of oblated sphereoid and curvature of sphereoid.
2. Feature or the shape of the sphere.
3. Feature or the shape of ellips.
4. Geodetic position.
5. Radius or carvature of the earth.

Surveying in geodesy.

1. Development of geodesy.
2. Development and geodetic surveying in practisement.
3. Method of location in the earth.
4. Method of computation on the earth.
5. Method of practisement in geodesy.

Triangulations.

1. System of triangulation.
2. Order of triangulation.
3. Measurement of triangulation stations.
4. Computation of triangulation.
5. Adjustment of triangulation or correction the angular error of closure.
6. Problems in triangulation.

E. 620 GEODESY.

Closed traverse.

1. Traverse or closed traverse.
2. Order of traverse.
3. Method of measurement traverse station.
4. Method of computing traverse.
5. Correction of closed traverse.
6. Problems in traverse.

Levelling.

1. Precise levelling.
2. Trigonometric levelling.
3. Procedure of running levelling.
4. Method of computing difference in elevation.
5. Correction the error of closure.

Base measurements.

1. Accessories in base measurements.
2. Method of base measurements.
3. Correction in base line.
4. Accuracy required.
5. Problems in base measurements.

Angles measurements.

1. Measured angles.
2. Instrument used in measuring horizontal angles.
3. Methods of measurement.
4. Error in measuring angles.
5. Accuracy required.
6. Problem occurs in angle measurements.

E. 521 TRANSPORTATION AND COMMUNICATION.

The elements of transportation economy.

1. Definition of transportation.
2. Significance of transportation to economy.
3. Transportation and economic development.
4. Transportation and social development.
5. Theory of transport rate and cost.
6. Advantage and disadvantage of any mode of transportation.

System of transportation in Thailand.

1. Primitive types of transport.
2. Water transport.
3. Railway transport.
4. Road transport.
5. Air transport.
6. Transport within city.
7. Transportation act 1954

E. 621 TRANSPORTATION AND COMMUNICATION.

Function of transportation.

1. Administration and promote.
2. Rule and regulation.
3. Work organization.
4. Procedure of planning and national policy.
5. Economic data and tabulating for planning.
6. Economic effect.

#### FACULTY STAFF

##### DEPARTMENT OF DESIGN

Kamhang	Faknoi	B. Arch.
Prachya	Chakajongsak	B. Arch.
Vivat	Temiyabandha	B. Arch.
Pussadee	Sujarittanondha	B. Arch. (Ind. Dsgn.)
Prasart	Gunatilaka	B.A. (Decorative Art)
Boonrat	Chanurai	Dip. in Electricity.

#### SPECIAL LECTURERS.

Ruangsuk	Arunaveja	B.A. (Sculpture)
Rungsarit	Tongsawat	B.A. (Decorative Art)
Sala	Thapadit	Cert. in Decoration
Prachit	Wamanondha	Cert. in Decoration
Yothin	Limpasuwatana	B. Arch. (Ind. Dsgn.)
Sermak	Narkbua	B.A. (Sculpture) M.F.A.
Bhothong	Keosudhi	B. Arch.
Watana	Ketpunya	B. Arch.

#### INTERIOR DESIGN DIVISION.

##### Objectives:

As usual, interior decoration costs more than the building itself. Good architects for exterior design can be found very easy but good interior designers are very rare. The graduates will raise the standard of the interior decoration higher they also have their ideal of considerable economy and moderate expression which show how well the designers can fit the job.

#### INDUSTRIAL DESIGN DIVISION.

##### Objectives:

To prepare students readily for their professional in industrial design. Initiation and appreciation of the progressive created thoughts will be their ideal. They will have experience and knowledge to strengthen their work for more efficiency.

Note :

lt.	=	lecture/hrs.
st.	=	studio/hrs.
cr.	=	credits

Prescribed Subjects.

Graphics  
Painting  
Sculpture  
Anatomy  
Language  
Humanity  
Theory of Interior Design  
Materials and Process  
History of Furniture  
Exhibition  
Services and Equipment  
Landscape Gardening  
Organization and Management  
Estimates  
Office Practice  
Field Trip

# INDUSTRIAL DESIGN DIVISION

Subjects	Semester 1		Semester 2		Semester 3		Semester 4		Semester 5		Semester 6	
	lt.	st. ct.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.	lt.	st. cr.
G. 01 Language	3	-	3	-	3	-	3	-	3	-	3	-
D. 01 Anatomy	1	3	1	3	1	3	1	3	1	3	1	3
D. 04 History of Furnitures	-	-	-	-	-	-	-	-	-	-	-	-
D. 05 Exhibition	-	-	-	-	-	-	-	-	-	-	-	-
D. 06 Materials and Process	2	-	2	-	2	-	2	-	2	-	2	-
D. 07 Theory of Industrial Design	2	-	2	-	2	-	2	-	2	-	2	-
D. 08 Design Practice	-	6	-	6	-	6	-	6	-	6	-	6
D. 09 Package Design	-	-	-	-	-	-	-	-	-	-	-	-
D. 10 Industrial Design	-	-	-	-	-	-	-	-	-	-	-	-
D. 11 Painting	-	3	-	3	-	3	-	3	-	3	-	3
D. 12 Sculpture	-	-	-	-	-	-	-	-	-	-	-	-
D. 13 Industrial Drawing	-	-	-	-	-	-	-	-	-	-	-	-
A. 01 Graphics	-	6	-	6	-	6	-	6	-	6	-	6
R. 01 Organization and Management	-	-	-	-	-	-	-	-	-	-	-	-
R. 03 Marketing	-	-	-	-	-	-	-	-	-	-	-	-
R. 05 Humanity	-	6	-	6	-	6	-	6	-	6	-	6
	8	27	23	8	27	23	11	24	23	11	24	23

Note :  
 lt. = lecture/hrs.  
 st. = studio/hrs.  
 cr. = credits.

## INDUSTRIAL DESIGN DIVISION.

### Prescribed Subjects.

Graphics  
 Industrial Drawing  
 Language  
 Materials and Process  
 Humanity  
 Painting  
 Sculpture  
 Theory of Industrial Design  
 Design Practice  
 History of Furniture  
 Package Design  
 Organization and Management  
 Industrial Design  
 Exhibition  
 Marketing  
 Anatomy  
 Office Practice  
 Field Trip

D. 101 ANATOMY

Study human skeleton, standard size, male and female figure.

1. The various shapes of bones.
2. The bones of the skull.
3. The bones of the trunk, neck.
4. The bones of the arm and hand.
5. The bones of the leg and foot.
6. Types of vertebrae.
7. Movements of the spinal column.

D.201 ANATOMY

Study muscles, types and functions.

1. General consideration on the types of muscles and tendon.
2. The muscles of head, face and neck.
3. The muscles of the trunk (Torso)
4. The muscle of leg and foot.

D. 102 THEORY OF INTERIOR DESIGN.

General principle of interior design.

1. Types of house.
2. Room divided by solid wall or space.
3. Interior color scheme.
4. Decorate materials for room divided by solid wall.
5. Decorate materials for room divided by space.
6. Size of various kinds of furniture: chairs, armchairs, dressing suit etc.
7. Design furniture by presenting drawing and models.

- 2 -

D. 202 THEORY OF INTERIOR DESIGN.

Study interior perspective, techniques of presentation and details of furniture.

1. Living area.
2. Dining area.
3. Pantry and counter.
4. Reading room.
5. Bed room.

D. 302 THEORY OF INTERIOR DESIGN.

Methods of presentation to client, function of rooms in a house and household furniture which must be designed.

1. Living room.
2. Dining room.
3. Pantry and small bar.

D. 402 THEORY OF INTERIOR DESIGN.

Interior design.

1. Master bed room.
2. Guest's room or single bed room.
3. Office and show room.
4. Air conditioning treatment.
5. Private office and official office
6. Grand business office.
7. Hotel main lobby.

D. 502 THEORY OF INTERIOR DESIGN.

Interior design of residential and commercial buildings showing.

1. The furniture lay out plan of the whole building.
2. Perspectives of important corner.
3. Detail working drawing.

D. 602 THEORY OF INTERIOR DESIGN.

Design exhibited pavillions which every square inch needs decoration.

1. Commercial pavillion and pavillions of nations in trade fair or fairs.
2. Music or opera bowl.
3. Beauty contest and fashion show center.

D. 203 MATERIALS AND PROCESS.

1. Material properties:
2. Weak point.
3. Decorated materials.
  - a. Stone.
  - b. Plaster
  - c. Terra cotta.
  - d. Mosaic.
  - e. Tiles.
4. Their utilization.

D. 303 MATERIALS AND PROCESS.

1. Proper material for curtain area.
2. Installation.
3. Decorated materials.
  - a. Bronz.
  - b. Brass.
  - c. Paint.
4. Their utilization.

D. 403 MATERIALS AND PROCESS.

1. Wood grain.
2. Natural texture of wood and finish.
3. Acoustic materials.
4. Materials and process of the air conditioned decoration.

D. 304 HISTORY OF FURNITURE.

1. Pre-historic furniture inventory.
2. Development of furniture characteristics.
  - a. Egyptian.
  - b. Middle ages.
  - c. Gothic.
  - d. Renaissance in England.
  - e. Renaissance in France.
  - f. Renaissance in Spain.
  - g. Renaissance in Italy.
  - h. Chinese.
  - i. Japanese.
3. Contemporary furniture.

D. 404 HISTORY OF FURNITURE.

1. Influence of industrial revolution.
  - a. Furniture making.
  - b. Furniture style.
  - c. Furniture design.
  - d. Materials.
  - e. Details.
2. New concept of furniture design.

D. 305 EXHIBITION.

1. Study psychology.
2. Influence of color
3. Space and form.
4. Circulation in exhibition.
5. Illumination.

D. 405 EXHIBITION.

1. Displayed partition structure.
2. Pavillion structure and details.
3. Design small exhibition.
4. Exhibition of a department store.
5. Indoor exhibition.
6. Outdoor exhibition.
7. Outdoor pavillion exhibition.

D. 505 EXHIBITION.

Advanced course.

D. 605 EXHIBITION.

More advanced course.

D. 106 MATERIALS AND PROCESS.

1. Properties of materials.
2. Weak point.
3. Strengthening and technique.

D. 206 MATERIALS AND PROCESS.

1. Raw material development.
2. Industrial mass production from raw materials.

D. 306 MATERIALS AND PROCESS.

1. Materials test and analysis.
2. Technique in preparation raw materials.

D. 406 MATERIALS AND PROCESS.

Research new methods to improve better process.

D. 107 THEORY OF INDUSTRIAL DESIGN.

1. Two dimension.
2. Point, line, plain.
3. Value of color.
4. Texture.
5. Space investigation.
6. Surface.

D. 207 THEORY OF INDUSTRIAL DESIGN.

1. Organic form.
2. Geometric form.
3. Volume illusion.
4. Brazing technique.
5. Finishing.
6. Formal and organic structure.

D. 307 THEORY OF INDUSTRIAL DESIGN.

1. Rendering technique.
2. Perspective technique.
3. Form refinement.
4. Topography.
5. Letter design.

D. 407 THEORY OF INDUSTRIAL DESIGN.

1. Illumination.
2. Human taste study.
3. Theory of movable product design: wheel chair.
4. Theory of self movable product design: fan, record player.

D. 507 THEORY OF INDUSTRIAL DESIGN.

1. Theory of product design for public use.
2. Street furniture.
  - a. Bus stop.
  - b. Telephone booth.
  - c. Street lantern.
3. Building mass products.

D. 607 THEORY OF INDUSTRIAL DESIGN.

1. Student's own individual project.
2. Individual concept in design.

D. 108 DESIGN PRACTICE.

(There are 5 elective courses)

Furniture.

1. Plants.
2. Seasoning process.
3. Joinery
4. Basic hand tools.
5. Wood carving.

Ceramics.

1. Basic fundamental.
2. Pinch method.
3. Coil method.
4. Slab build method.
5. Biscuit firing.
6. Glazing.

Basketing.

1. Materials for basketing.
2. Tools and equipment.
3. Basic of basketing using: palm, banana, stem, bamboo, rattan.

Enamel.

1. Metal cutting.
2. Woving
3. Firing.
4. Surface treatment.

Weaving and textile.

1. Textile fibre.
2. Chemical and physical properties of textile fibre.
3. Fibre identification.
4. Yarns.
5. Bleaching and whitening.
6. Finishes.
7. Dyes and dying.

D. 208 DESIGN PRACTICE.

Furniture.

1. Laminating.
2. Plywood.
3. Artificial wood: formica, shaving board.
4. Surface finishes.

Ceramics.

1. Potter's wheel.
2. Jiggering.
3. Transparent glaze.
4. Opaque glaze.

Basketing.

1. Coconut fibre.
2. Jude.
3. Plastic.
4. Design: grass basket, lantern, hand bag.

Enamel.

1. Design pin.
2. Rings.
3. Glass tray.
4. Color theory.

Weaving and textile.

1. History of textile.
2. Tools and accessories.
3. Making the warp.
4. Fabric construction.
5. Preparing the loom.
6. An approach to design.
7. Weaving the sample.

D. 308 DESIGN PRACTICE.

Furniture.

1. Metal usage.
2. Combination of wood and metal design.
3. Machine operation.
4. Maintenance.

Ceramics.

1. Potter's wheel (Continue)
2. Plaster molding.
3. Casting.
4. Glay mixing.
5. Glazing techniques.

Basketing.

1. Coloring in basketing.
2. Dying.
3. Texture making.
4. Combined materials.

Enamel.

1. History of enamel.
2. Pattern design.
3. Jewelry design.

Weaving and textile.

1. Design tapestry.
2. Design drapery.

D. 408 DESIGN PRACTICE.

Furniture.

1. Study human scale.
2. Basic upholstery.
3. Mass production details.
4. Assembling techniques.

Ceramics.

Advanced course stress on more difficult and progress forms, color, and texture.

Basketing.

1. Costless material usage.
2. Design carpet, purse, lantern.

Enamel.

More complex and progress design of jewelry.

Weaving and textile.

Applied decoration by printing.

1. Screen printing.
2. Warp printing.
3. Direct printing.
4. Duplex printing.
5. Discharge printing.

D. 508 DESIGN PRACTICE.

Furniture.

1. Machine operation (continue)
2. Mass production methods and process.
3. Small furniture stool, chair, shelf.

Ceramics.

1. History of ceramics.
2. Ceramics sculpture.
3. Kiln maintenance.
4. Firing techniques.

Basketing.

1. Design furniture by basketing.
2. Rattan chair, rope chair, plastic chair.
3. Japanese screen.

Enamel.

Assembling methods of single unit design: belt, chain.

Weaving and textile.

1. Design partition.
2. Screen.
3. 3 - 8 harness weaves.

D. 608 DESIGN PRACTICE.

Furniture.

1. Joinery research.
2. Economy.
3. Shop planning and running.
4. Suit of furniture: dining table, desk and chair.

Ceramics.

1. History of ceramics (continue)
2. Ceramics mural.
3. Equipment maintenance.

Basketing.

1. Combined materials.
2. More complex design: rattan + wood, rattan + matel, plastic + matel.

Enamel.

More difficult design: cigarette case, ash tray, bowl.

Weaving and textile.

1. Design upholstery.
2. Rug.

D. 309 PACKAGE DESIGN.

1. Theory of package design.
2. Color in package design.
3. Forms and texture.
4. Trade mark design.

D. 409 PACKAGE DESIGN.

1. Packing convenience.
2. Identification of product in package by expression of:
  - a. Words and letters.
  - b. Photograph.
  - c. Symbols.
  - d. Product drawing.

D. 509 PACKAGE DESIGN.

1. Convenience in package transportation.
2. Household product package.
  - a. Detergent package.
  - b. Tissue package.
  - c. Kitchen product package.
  - d. Toy package.

- D. 609 PACKAGE DESIGN.
1. Attractive package design methods.
  2. Package recognition.
  3. Cosmetic package design.
    - a. Cosmetic symbol.
    - b. Perfume bottle and package for man and woman.
    - c. Soap package.
- D. 510 INDUSTRIAL DESIGN.
1. Presentation by rendering and modeling.
  2. Re-design poor industrial products.
  3. Skill improvement.
  4. Design brand new industrial products.
  5. Design steps preparation.
- D. 610 INDUSTRIAL DESIGN.
1. Work man and machine relationship.
  2. Machine operation.
  3. Problem solving.
  4. Initiative habits.
  5. Customer's needs.
  6. Influence of design.
- D. 111 PAINTING  
Water color.
1. Theory of color.
  2. Still life from few subjects.
  3. Forms and color composition and space.
  4. Tonality and atmosphere.

- D. 211 PAINTING  
Water color.
1. Landscape.
  2. Still life.
  3. Slum.
  4. Riverscape.
- D. 311 PAINTING  
Water color.
1. More subject still life.
  2. Characteristics.
  3. Expression and atmosphere.
  4. Portrait.
- D. 411 PAINTING  
Water color.
1. Advanced landscape.
  2. Slum.
  3. Riverscape.
  4. Perspective view from nature.
- D. 511 PAINTING  
Water color.
1. Free expression.
  2. Advanced still life.
  3. Texture, forms, color.
  4. Harmony and contrast.
  5. Atmosphere.
  6. Still life composition.

D. 611 PAINTING

Oil painting.

1. Portrait.
2. Still life from few subjects.
3. Composition and poster design.
4. Mural painting.

D. 112 SCULPTURE.

1. Bas relief.
2. High relief.
3. Round relief.

D. 212 SCULPTURE.

1. Wood carvings.
2. Stone carvings.
3. Techniques of portrait.

D. 312 SCULPTURE.

1. Composition studying from plaster.
2. Life and imagination.
3. Round relief design and practice.

D. 412 SCULPTURE.

1. Composition of imagination.
2. Bas relief of medals, animals.
3. Mural and wall treatments.

D. 512 SCULPTURE.

1. Plaster sculpture of round relief.
2. Plaster modellings and casting.
3. Bronze castings.

D. 612 SCULPTURE

1. Sculpture for interior decoration.
2. Home and public fountain.
3. Wall sculpture.
4. Wire, mobile sculpture.

D. 213 INDUSTRIAL DRAWING.

1. The use of instruments.
2. Lettering.
3. Geometry used in drawing.
4. The theory of projection drawing.
5. Dimension and notes.
6. Pictorial drawing.
7. Auxiliary views.
8. Section and conventions.
9. Bolts, screws, keys, rivet, and springs.
10. Working drawing.

D. 614 ESTIMATES.

1. Detail estimates.
  - a. Material lists.
  - b. Material costs.
  - c. Labor costs.
  - d. Estimate technique.
2. Rough estimates.
3. Practice.

FACULTY STAFF.

DEPARTMENT OF GENERAL AND RELATED SUBJECTS  
=====

Rapee	Somaphuti	B.A., B.Ed.
Achara	Srisuthep	B.Ed.
A-ngun	Arsawate	B.A.
Sukonda	Sapahongs	B.A., B.Ed.
Pralong	Berananda	B.A. (Aberdeen)
Prarop	Jantraphakdee	Dip. in Ed.

SPECIAL LECTURERS.

Luang Jalanussorn		B.Sc.
Ratana	Atthakorn	Dip. in Painting & Sculpture, M.A.T.
Somsri	Chullanandha	B.A.C., M.A., M.S.
Arun	Kaeosondhi	B.Eng., M.Eng., M.S., Dip. in Ed., B. Ed.
Thanom	Intharit	B.Sc., M.Sc., Dip. in Ed., M.S.
Sawangwan	Suphachalat	B.Com.
Dr. Withaya Wistawet		B.A., Ph.D.
Dhep	Junladulya	Cert. of Journalism, Dip. of Mass Communication.
Chalerm	Kaeokangwal	B.Eng., M.S.
Srindhondhep Bhakdikul		Dip. in Painting.
Wichitwan	Sukri	B.Eng.
Witaya	Rungsang	B.Eng.

R. 501 ORGANIZATION AND MANAGEMENT.

Concept of organization and management.  
Specialization of work.  
Principle of organization.  
Administrative staff services.  
The role of O&M service and O&M analysis.  
Administrative survey.  
Work simplification.  
Administration of an office.  
Supervision.

R. 502 ESTIMATES, QUANTITIES AND SPECIFICATION.

Principle of estimates.  
Rough estimate and detail estimate.  
Labor cost.  
Cost of construction.  
Steps of work.  
Problems.

R. 602 ESTIMATES, QUANTITIES AND SPECIFICATION.

Report.  
Price list of building materials.  
Contract writing.

R. 603 MARKETING CONDITIONS.

Condition and situation of commercial market.  
Management of the marketing situation.  
Policy of marketing arrangement of goods.  
Principle of goods production.  
Demand of the market.  
Demand of the market analysis.  
Selling process.  
Price limitation.

R. 104 LAND AND LAND REGISTRATION.

Land policy.  
Allocation of land.  
Issue the land title deed.  
Land control.  
Surveying and powers and duties of the land surveyer.

R. 204 LAND AND LAND REGISTRATION.

The duty of the land surveyer.  
Ruler regarding to issue the land title deed.  
Method of issuing the land title deed.  
Practice regarding to survey and investigation of rights at the first registration to land.

R. 105 HUMANITY.

Meaning and kinds of visual art.  
Fundamental of visual art design, principle of elements of art.  
Theory of color, general utilization, and color in architecture.  
Two dimension composition, using line, form, color, and texture.  
Meaning of three dimension.  
Introduction to research of sculpture and architecture.  
Design three dimension using wood, paper, clay, and plaster.

R. 205 HUMANITY.

Portrait.  
Proportion.  
Composition.  
Perspective  
Color and texture.  
Portrait (continued)  
Drawing technique.  
Atmospheric proportion.  
Emotion and feeling.  
Focal point treatment.

R. 305 HUMANITY.

Pre-historical period and primitive art.  
Egyptian, Mesopotimian, Greek, and Roman art influence to Europe.  
Chinese, Japanese, Indian art influence to various countries in Asia.

R. 405 HUMANITY.

Middle, Modern and Thai art.  
Christian, Byzantine, Romanesque, Gothic art.  
Renaissance, Democracy and modern.  
Dhawarawadee, Sriwichai, Lopburi, Chiengsaen, Sukhothai, U-Thong,  
Ayudhya and Ratanakhosin art.

R. 505 HUMANITY.

Research of Thai and foreign art in painting, sculpture,  
architecture, literature, and music, discuss on their advantages  
and disadvantages, having pertinent lecturer described and  
demonstrated music and literature.  
Submit scrap book and report.

R. 605 HUMANITY.

Psychology of learning.  
Motive and drive.  
Adaptation.  
Personality development.  
Logical thinking.  
Ambiguity and clasification of meaning.  
Reasoning, Definition.  
Moral teaching: Buddhism and the West.  
The goals of various types of religion.

R. 406 CITY PLANNING.

Evolution of cities.

Urban planning process, middle and renaissance.

Physical environment.

Civilizational characteristics.

R. 506 CITY PLANNING.

Introduction to city planning.

Introduction to planning process.

Population.

Geography.

Economy

Sociology

Political science.

Transportation.

Public health.

R. 606 CITY PLANNING.

Methods of analysis.

Land use study.

Residential.

Industrial.

Commercial

Government.

Semi public.

Recreation.

Public housing control and housing.

Urban renewal and traffic problems.

R. 513 TRAFFIC ENGINEERING AND CITY PLANNING.

Basic planning and design.

Residential.

Commercial.

Industrial.

History.

Theory of city planning.

Land use design.

Transportation system.

R. 613 TRAFFIC ENGINEERING AND CITY PLANNING.

Graphics and design.

Map survey.

Land use analysis.

Research and traffic count.

Transportation land use.

Principle of city planning.

Presentation.

Field practice.

R. 507 LANDSCAPE ARCHITECTURE.

Principal of landscape architecture.

Oriental landscape gardening.

Western landscape gardening.

Contemporary landscape gardening.

Materials.

Methods and process.

Surroundings.

Plants.

R. 607 LANDSCAPE ARCHITECTURE.

Principal of landscape design.

Features, forms, and natural forces.

Relationships of man to landscape.

Organization of spaces.

Harmonious relationship of indoor and outdoor.

Design:

Residential.

Public.

Civil (city).

R. 108 APPLIED MECHANICS.

Statics.

1. Definitions.
2. Quantities and their units.
3. Vectors and their quantities.
4. Method of solving problem.
5. Free body and its diagram, Coplanar, Concurrent Forces.
6. Definitions.
7. Resultant of two forces, graphically.
8. Resolution of a force into components.
9. Resultant of two forces, trigonometrically.
10. Resultant of two forces, algebraically.
11. Resultant of three or more forces.
12. Principle of moments.
13. Equilibrium of three or more forces, graphic solution.
14. Equilibrium of three or more forces, trigonometric solution.
15. Equilibrium of three or more forces, algebraic solution by summation of forces.
16. Equilibrium of three or more forces, algebraic solution by moments Coplanar, Parallel Forces.
17. Resultant of two parallel forces, graphically.
18. Principle of moments of two parallel forces.
19. Resultant of two parallel forces, algebraically.
20. Force diagram and space diagram.
21. Resultant of three or more parallel forces, graphically.
22. Resultant of three or more parallel forces, algebraically.
23. Equilibrium of parallel forces, graphic solution.
24. Equilibrium of parallel forces, algebraic solution.
25. Coplanar, Non-concurrent Forces.
26. Resultant of Coplanar, Non-concurrent Forces, graphically.
27. Resultant of Coplanar, Non-concurrent Forces algebraically.
28. Principle of Moments.
29. Equilibrium of Coplanar, Non-concurrent Forces, graphic solution.

30. Equilibrium of Coplanar, Non-concurrent.
31. Stress in trussess, graphic and algebraic solution Concurrent Forces in Space.
32. Resolution of a forces into three rectangular components.
33. Resultant of Concurrent forces in spaces.
34. Moment of a force with respect to a line.
35. Principle of Moments.
36. Equilibrium of concurrent forces in space: graphic and algebraic solution.  
Parallel Forces in Space.
37. Resultant of Parallel Forces in Space, graphically and algebraically.
38. Equilibrium of Parallel Forces in Space, algebraic and graphic solution.  
Friction.
39. Static and Kinetic Friction.
40. Coefficient and Angle of Friction.
41. Friction on square-threaded screw.
42. Friction on pivots and ring bearings.  
Centroids and Center of Gravity.
43. Centroids of some simple surfaces and solids.
44. Centroids of line, surfaces and solids by integration.
45. Centroids of composite line, surface and solids.
46. Center of gravity of composition weights.  
Moment of Inertia of Areas.
47. Definition of Moment of Inertia and Radius of Gyration.
48. Moments of Inertia of some simple areas.

R. 208 APPLIED MACHANICS.

Dynamics.

1. Definitions.
2. Rectilinear Displacement.
3. Rectilinear Velocity and Speed.
4. Rectilinear Acceleration.
5. Motion of particle with constant rectilinear acceleration.
6. Falling bodies.
7. Composition and resolution of velocity and acceleration.
8. Relative motion.
9. Displacement in curvilinear motion.
10. Velocity and acceleration in curvilinear motion.

Kinetics of Rigid Bodies in Rectilinear Translation.

11. Definition and general principle.
12. Newton's three laws of motion.
13. Relation between forces, mass and acceleration.
14. Effective forces on rigid bodies.
15. Reaction on accelerated rigid bodies.

Moments of Inertia of Masses.

16. Definition and Units.
17. Moment of inertia of thin plates.
18. Moment of inertia of some geometric solids.

Relation of Rigid Bodies.

19. Angular displacement.
20. Angular velocity.
21. Angular acceleration.
22. Uniform motion in a circle.
23. Constant angular acceleration.
24. Effective forces on a rotating body.
25. Moment of tangential effective forces.
26. Resultant of tangential effective forces.
27. Resultant of normal effective forces.
28. Super-elevation of railway track and banking of highway curves.

Work Energy and power.

29. Definition.

30. Relation between Work and Kinetic Energy.

31. Kinetic Energy of Translation Force Constant.

32. Kinetic Energy of Relation.

33. Power and Efficiency.

R. 309 STRENGTH OF MATERIALS.

PART I Stress & Strain.

1. Introduction.

2. Stress due to central loads.

3. Stress on oblique section.

4. Stress strain Curve (Proportional limit, Yield point, Ultimate strength, Elastic limit, Yield strength, Modulus of Elasticity)

5. Statically Indeterminate Axial load Members.

6. Working Stress and Factor of safety.

R. 409 STRENGTH OF MATERIALS.

PART II. Riveted and Joints.

1. Stress in thin wall cylinder and sphere.

2. Riveted joints.

3. Types of Riveted joints.

4. Stresses in Riveted joints.

5. Assumptions Condition affecting strength of Riveted joints

6. Allowable stress in Riveted joint.

7. Welded joints.

PART III. Stress Strain caused by Tension loads.

1. Torsion loads and Twisting Moment.

2. Torsion Formula and Assumption.

3. Shearing Stress and due to twist of cylindrical shaft.

R. 509 STRENGTH OF MATERIALS.

PART IV. Transverse load, Stresses Beams.

1. Preliminary Considerations.

2. Vertical shear, Resistive shear bending Moment and resisting Moment.

3. Assumption and the flexure formula.

4. Shear and moment diagram.

5. Relation between shear and Moment.

6. Over hanging beams.

7. Shearing stress in a beam.

PART V. Columns Compression Member.

1. Introduction.

2. Two limiting cases of Compression Members and two Models of failure.

3. Various types of columns.

4. Formula for columns in various types.

R. 410 SOIL MECHANICS.

1. Soil and soil deposits.

2. Phases of soil composition.

3. Structure of natural soils.

4. Soil classification and identification.

5. Flow wet.

6. Stress distribution in soil.

7. Consolidation and settlement.

8. Shear strength.

9. Stability of slopes.

10. Bearing capacity of soils.

11. Bearing capacity of piles.

12. Lateral earth pressure.

13. Compaction and stabilisation.

14. Soil testing procedures.

R. 411 FLUID MECHANICS.

1. Fluid Properties.
2. Unit and Scale of Pressure Measurement.
3. Forces on Plane and curve surface.
4. Stability of Floating and Submerged body.
5. Types of Flow.
6. Basic Equations.
7. Viscous effect drag on immersed body.
8. Resistance to Viscous and turbulent flow in opens and closed conduits.
9. Hydraulic similitude and model laws.
10. Measurement of flow.
11. Closed conduit flow.
12. Non-uniform and uniform flow in open channel.
13. Stable channel design.

R. 312 LANDSCAPE GARDENING.

1. Botany.
  - family.
  - genus.
  - species.
  - variety.
2. Shrubs.
  - flowering shrubs.
  - foliage shrub.
3. Climbing and twining shrubs and herbs.
4. Trees.
  - handsome foliage trees.
  - beautiful flowering trees.
5. Tropical plants.

R. 412 LANDSCAPE GARDENING.

1. Section of plans deceration.
  - upright foliage plants.
  - bulbs grown for foliage.
  - bulbs grown for flowers.
  - philodendron & monstera.
  - palms & ferns.
  - water-plants.
  - cactus & succulent.
2. Propagation.
3. Green house gardening.

R. 512 LANDSCAPE GARDENING.

1. Principle of landscape gardening.
2. Nature.
3. Plants.
4. Materials.
5. The basic plan.
6. Handling the basic components.

R. 612 LANDSCAPE GARDENING.

1. Landscape composition.
  - formal styles.
  - informal styles.
2. European gardens.
3. Japanese gardens.
  - hill gardens.
  - flat gardens.
  - tea gardens.
4. Modern gardens.
  - rock gardens.
  - mixed gardens.
  - pot and water gardens.
  - a small gardens-kitchen and home gardens.

- 5. Design.
  - public.
  - park.

R. 614 HIGHWAY ESTIMATES.

- 1. Principle of estimates.
- 2. Rough estimate and detail estimate.
- 3. Cost quantity estimate.
- 4. Drawing and spec
- 5. Steps of work.
- 6. Bill of materials.
- 7. Contract writing.

G. 101 LANGUAGE.

- 1. Verbs Auxiliary Verbs, Finite and Non Finite Verbs.
- 2. Pronunciation & Conversation.
- 3. Basic word order and articles and prepositions.
- 4. Transformation of Sentences.
- 5. Comprehension.
  - a. internal reading.
  - b. selected simple short stories.
  - c. external reading.
  - d. texts.
- 6. Composition.
- 7. Technical Terms.
- 8. Letter writing, writing friendly letter.

G. 201 LANGUAGE.

- 1. Tenses & sequence of tenses.
- 2. Position of adjective and adverbs.
- 3. Noun used as Adjective
- 4. Comprehension.
  - a. internal reading.
  - b. selected simple short stories.
  - c. external reading.
  - d. texts.
- 5. Conversation.
- 6. Composition.
- 7. Technical terms.

G. 301 LANGUAGE.

1. Advanced Pronunciation and Conversation.
2. Review of Tenses.
3. Active & Passive Voice.
4. Direct & Indirect Speech.
5. Comprehension:
  - a. internal reading.
  - b. selected simple short stories.
  - c. external reading.
  - d. texts.
6. Technical Terms.

G. 401 LANGUAGE.

1. Practice more Conversation.
2. Reading - technical text book.
3. Comprehension:
  - a. internal reading.
  - b. selected simple short stories.
  - c. external reading.
  - d. Composition (report writing)

G. 501 LANGUAGE.

1. Practice more conversation and composition.
2. Review of structure essentials.
3. Reading - technical text book.
4. Correct Usage.
5. Words often confused.
6. Idioms and Expressions.
7. Prepositions and the patterns in which they occur which are frequently used.

8. Comprehension:

- a. internal reading.
  - b. selected short stories.
  - c. external reading.
  - d. texts.
9. Business letters.
10. Technical report writing.

G. 601 LANGUAGE.

1. Analyze sentences.
2. Conversation and composition.
3. Review of structure essentials.
4. Reading - Technical Text book.
5. Words often confused (continued)
6. Idioms and Expressions (continued)
7. Comprehension:
  - a. internal reading.
  - b. selected short stories.
  - c. external reading.
  - d. texts.
8. Business letter writing.
9. Technical report writing.

G. 102 PHYSICS.

Mechanics.

1. Composition and resolution of vectors.
2. Equilibrium.
3. Moments-center of gravity.
4. Rectilinear motion.
5. Newton's law.
6. Motion of projectile.
7. Work and energy.
8. Impulse and momentum.
9. Circular motion.
10. Rotation.
11. Elasticity.
12. Harmonic motion.
13. Hydrostatics.
14. Hydrodynamics.

Heat.

1. Temperature.
2. Thermal expansion.
3. Quantity of heat.
4. Transfer of heat.
5. Thermal properties of matter.
6. Thermodynamics.

G. 202 PHYSICS.

Sound

1. Wave motion.
2. Vibrating bodies.
3. Acoustical phenomena.

Electricity and magnetism.

1. Coulombs's law.
2. The Electric Field.
3. Potential.

4. Properties of dielectrics capacitance.
5. Current and resistance.
6. D.C. Circuits.
7. Principle of Electrochemistry.
8. Electrical instruments.
9. The magnetic field.
10. Magnetic field of a current and of a moving charge.
11. Magnetic properties of matter.
12. Capacitance and inductance.
13. Alternating currents.

Optics.

1. The nature and propagation of light.
2. Reflection and refraction of light.
3. Lense.
4. Optical instruments.

G. 104 MATHEMATICS.

1. Basic concepts: directed line segment, vector, set, real numbers, absolute value, plot graphs on a plane.
2. Function and graphs of function: Equation and given locus, Intercept, Symmetry, Extent, Asymtote, Translation of Axis, Composite graph, point of intersection of graphs.
3. Rectangular Co-ordinates: Projection, Distance between two points, Inclination and slope of a line, Points of Division.
4. Straight line: General equation of first degree, Normal from of a straight line, Distance from a line to a point.
5. Circle: The equation of the circle.
6. Number of System.
7. Scale of Notation.
8. Conic section.

G. 204 MATHEMATICS.

1. The slope of curve, derivative of functions Velocity and rates of change.
2. Limits.
3. Differentiation of algebraic function, Implicit function.
4. Applied differential: Angle of intersection of curves, subtangent and subnormal, Maxima and minima. Point of inflection.
5. Differential of function: Rate of change, Small errors.
6. Mean value Theorem.
7. Differentiation of Trigonometric Functions, exponential and logarithmic functions.  
Higher Algebra.
8. Binomial Theorem.
9. Inequalities.
10. Partial Fraction.
11. Determinant.

G. 304 MATHEMATICS.

Integration.

1. Indefinite Integral, Definite Integral, Equation of Differential, Theorem of Integration.
2. Limit of Trigonometric function, The definite integral as an area.
3. Transcendental function.
4. Logarithmic functions and Exponential functions, Integration by substitution.
5. Application of Integration: Volume of solid of revolution, annulus and shell method, Surface area of solid of revolution.
6. Hyperbolic function.

G. 103 HYGIENE.

Physical hygiene.

1. Personal hygiene: hair, ears, nose, mouth, teeth, skin.
2. Exercise: posture positions, nutrition and dietition.
3. Communicable diseases.
4. Prevention and treatment.
5. Symptom: dysentary, cholera, malaria, tuberculosis, syphilis, gonorrhea, yawsar flamboesia, allergic, small pox. etc.
6. First aid: haemorrhage (external and internal), stop bleeding, shock, wounds, fainting syncope, heat and sun stroke, heat cramp, convulsion, coma, drowning, artificial respiration, strain, dislocation, sprain, fracture, snake bites etc.

Mental hygiene.

Social well being.

G. 305 STATISTICS.

Theory.

1. Primary statistics.
2. Calculation.
3. Definition and significance of statistic symbols.
4. Probability theory.
5. Permutation and combination.
6. Matrix.
7. Sampling theory.

Applied.

1. Statistical steps.
2. Statistical planning.
3. Presenting of data.
4. Analysis of statistical series.
5. Significance of statistics for construction planning.
6. Statistical factors for construction.
7. Conclusion.

G. 106 CHEMISTRY.

Inorganic Chemistry.

1. Forms of matter.
2. Weight Relationship.
3. Symbols, Formulas, Equations.
4. Chemical calculations.
5. The structures of Atoms.
6. Thermochemistry.
7. Properties of gases.
8. Liquefaction of gases, Properties of liquids and solids.
9. Relative weights of molecules.
10. Relative activity of metals.
11. Solutions.
12. Physical properties of solutions.
13. Acids, Bases, and Salt.
14. Reversible reactions and Chemical equilibrium.
15. Ionization.
16. Ion Equilibrium.
17. Classification of the elements.
18. Types of chemical reaction.

G. 206 CHEMISTRY.

Inorganic Chemistry.

1. Colloids.
2. Electrolysis.
3. Industrial electrochemical process.
4. Battery cells.
5. Metal and Alloys.
6. Heavy metals.
7. Iron and Steel.
8. Some nonmetallic elements.
9. Halogens and compounds of the Halogens

10. Nuclear chemistry.
11. Organic chemistry.
12. Hydrocarbons.
13. Derivatives of the Hydrocarbons.
14. Organic material of natural origin.
15. Organic synthetic products.