



EU-TEMPUS PROJECT EDUWAT



DEVELOPMENT OF A MODERN HIGHER EDUCATION SYSTEM FOR WATER ENGINEERING IN SYRIA

Damascus 9-13/01/2011

**Tishreen University (TIU)
Lattakia- Syria**

**Coordinator
Prof. Dr. Eng. Izzeddin Hassan**

**Department of Water Engineering and Irrigation
Faculty of Civil Engineering**

Coordinator of Tishreen University (TIU)

Prof. Dr. Eng. Izzeddin Hassan

Scientific positions

- ☐ **Full- Time Professor at the Department of Water Engineering and Irrigation at Tishreen University , 2003;**
- ☐ **Associate Professor , Department of Water Engineering , 1996;**
- ☐ **lecturer at Department of Water Engineering / Tishreen University, 1991;**
- ☐ **Head of Department of Water Engineering / Tishreen University 2001-2005;**
- ☐ **Head of Department of Water Engineering and Irrigation/ Tishreen University; 2007-2009.**

Qualifications

- ❑ **Ph. D in "Hydraulic structures and Dams", Technical University of Dresden, Germany, 1989;**
- ❑ **Postgraduate Diploma in " Groundwater investment", Technical University of Dresden, Germany, 1988;.**
- ❑ **Bachelor Degree in Civil Engineering/ Tishreen University ,1983.**

Training & courses

16-9 to 6-12-1997	<p>DAAD Exhibition at Technical University of Dresden/ Faculty of Civil Engineering, Institute of structures and Fluid mechanics. The main Subject was regulation of river Al Kabir Al Shimali between 16 November Dam and Attalla Bridge (Lattakia-Syria) using numerical Methods.</p> <p>By Prof. Wagner.</p>
13-10 to 27-12-2002	<p>DAAD Exhibition at Technical University of Dresden/ Faculty of Forest-Geo- and Hydro sciences, Institute of Hydrology. The main Subject was Recharge of the Groundwater reservoir with the Water of Barada River in Spring Time using the Program Modflow.</p> <p>By Prof. G. Schmitz.</p>
09-09 to 02-11-2007	<p>DAAD Exhibition at Technical University of Dresden/ Faculty of Forest- Geo- and Hydro Sciences, Institute of Waste Management and Contaminated Site Treatment . The main Subject was “Recharge of the Groundwater with a treated Waste water using the Program ASM (Aquifer Simulation Modeling) in the Homs region (Syria)”.</p> <p>By Prof P. W. Graeber.</p>

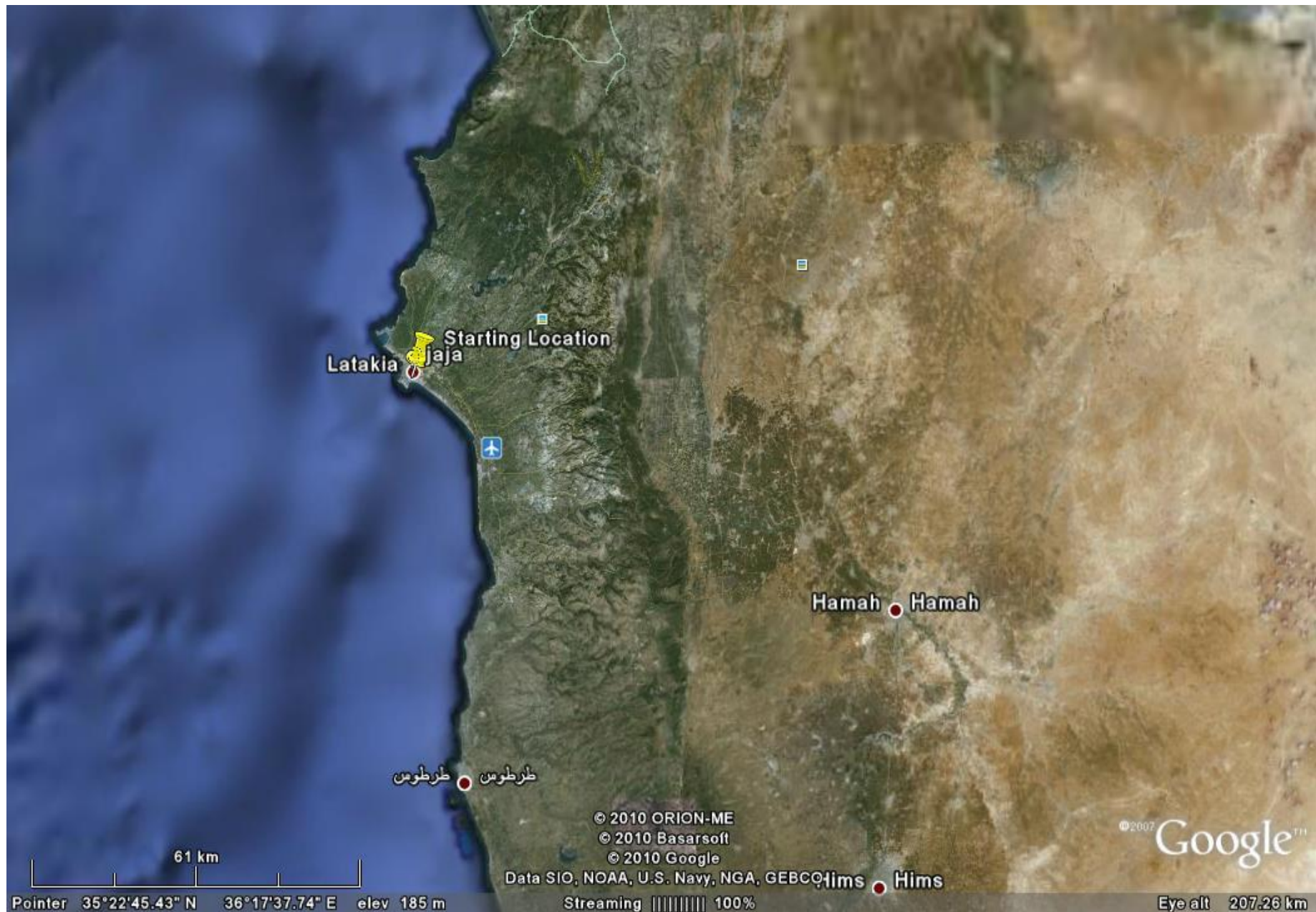
Experiences

- ❑ Ph. D in Hydraulic structures and Dams " [hydro automatic Regulation of Irrigation Canal networks](#)".
- ❑ Programming and Modeling of unsteady flows in Rivers and canals and other Problems of water movements.
- ❑ Lecture courses: water resources, water structures, Irrigation , drainage ,waste and drinking Water at the universities Sirt (Libya),Al Zaim Al Azhari (Sudan) and the Syrian Universities.
- ❑ Some publications in Workshops and Journals and 4 scientific Books for the students and Engineers.
- ❑ Translation of Book ([Hochwasserhandbuch Auswirkungen und Schutz](#)" Autor Heinz Patt, Springer Verlag 2002) from German into Arabic.

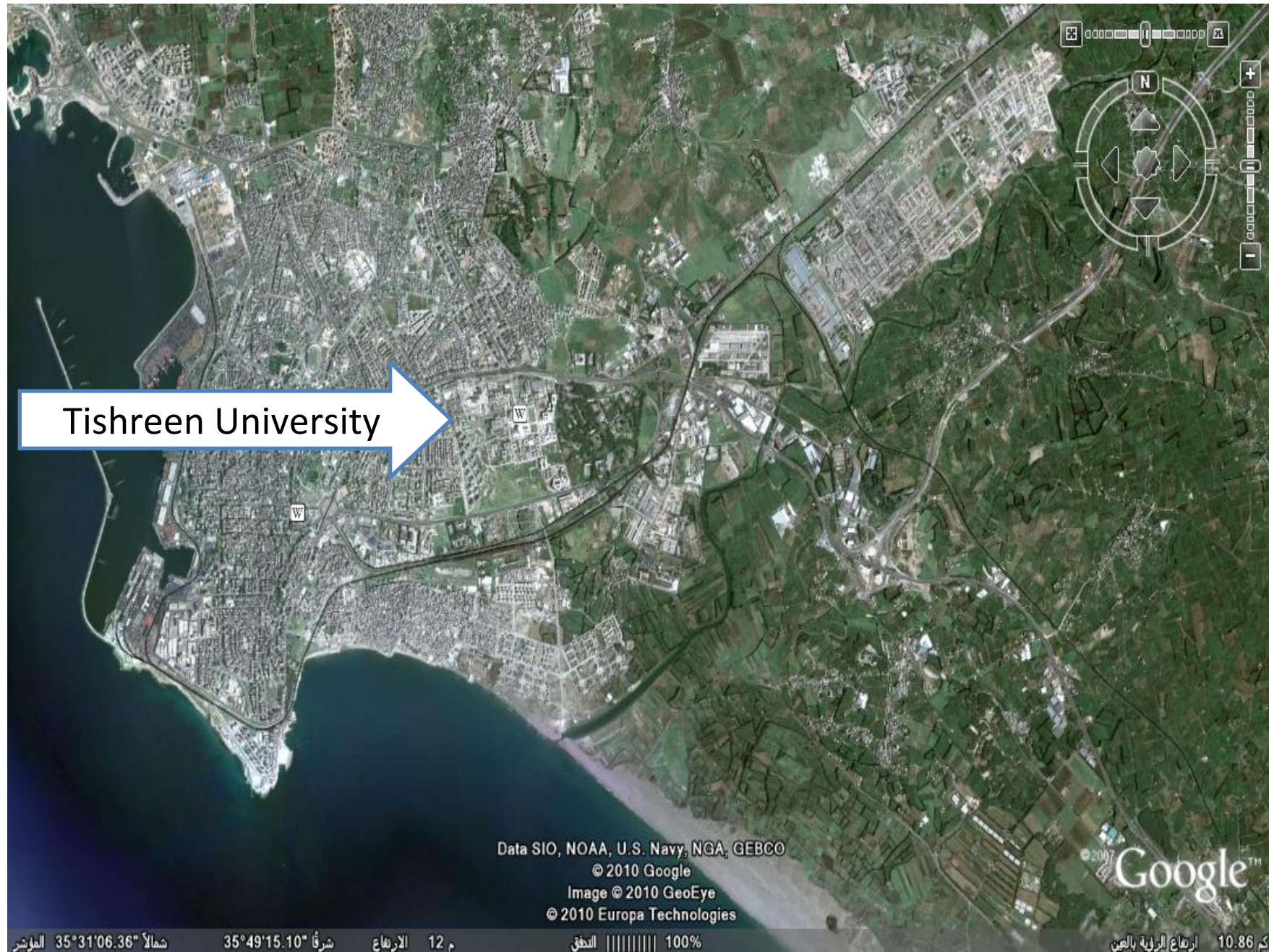
Achievements

- ❑ **Winner of the 1. st scientific Prize** in the field of Engineering sciences in Syria in 1998 for my Publication "a hydraulic Study of Hydraulic structures, case Study "Regulation of Alkabir Shimali River between 16 November Dam and Attalla Bridge using numerical Methods", Basel Al Assad Journal - 1999" ;
- ❑ **Studying and planning some important Projects in Syria as Regulation of rivers Al sin and Markieh ;**
- ❑ **Vital role in Establishing a good Cooperation between the Syrian and the German Universities and Companies and other Institutions in Higher Education and Praxis.**

Lattakia from Syria



Lattakia City



Tishreen University (Lattakia, Syria)



Tishreen University

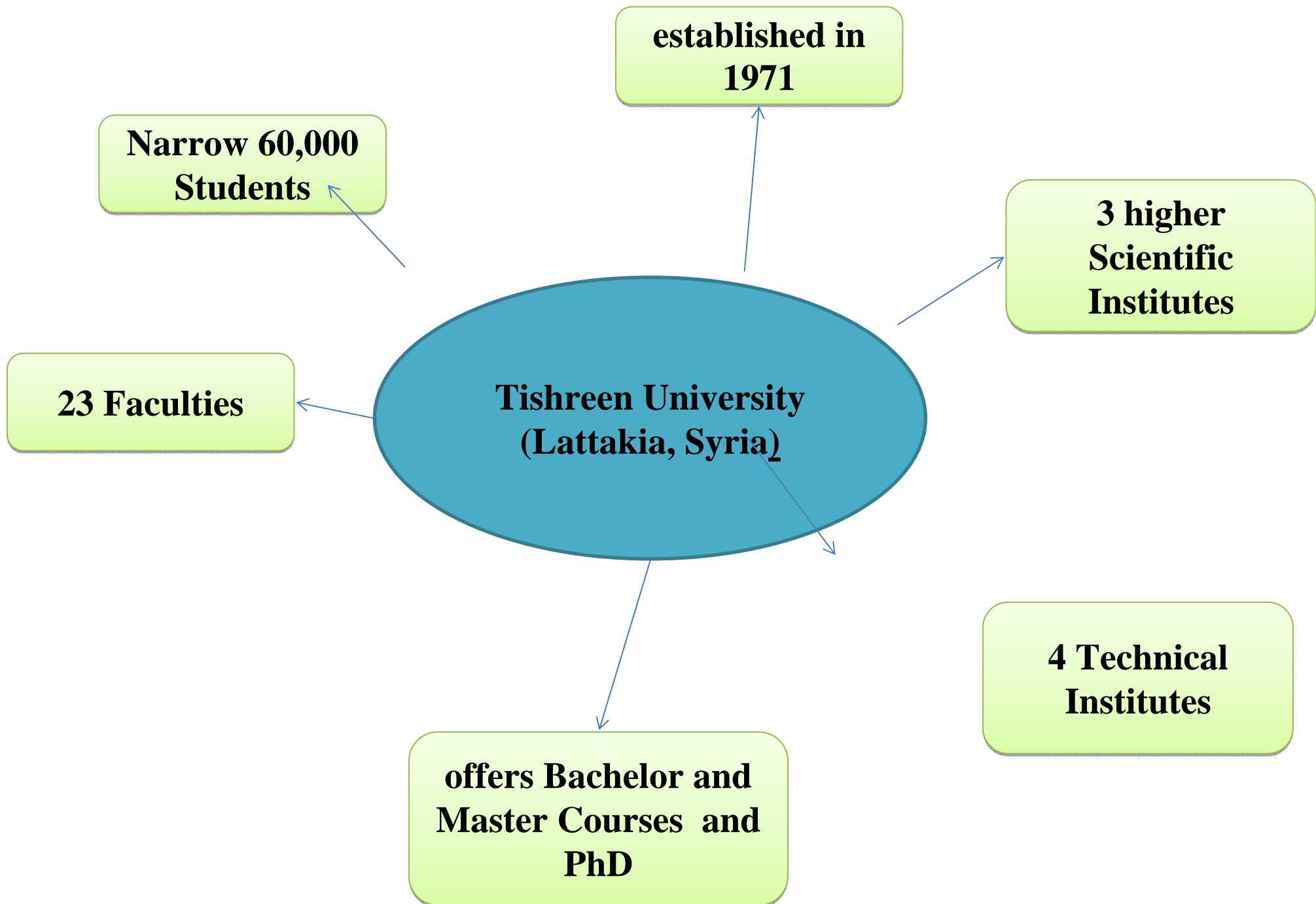
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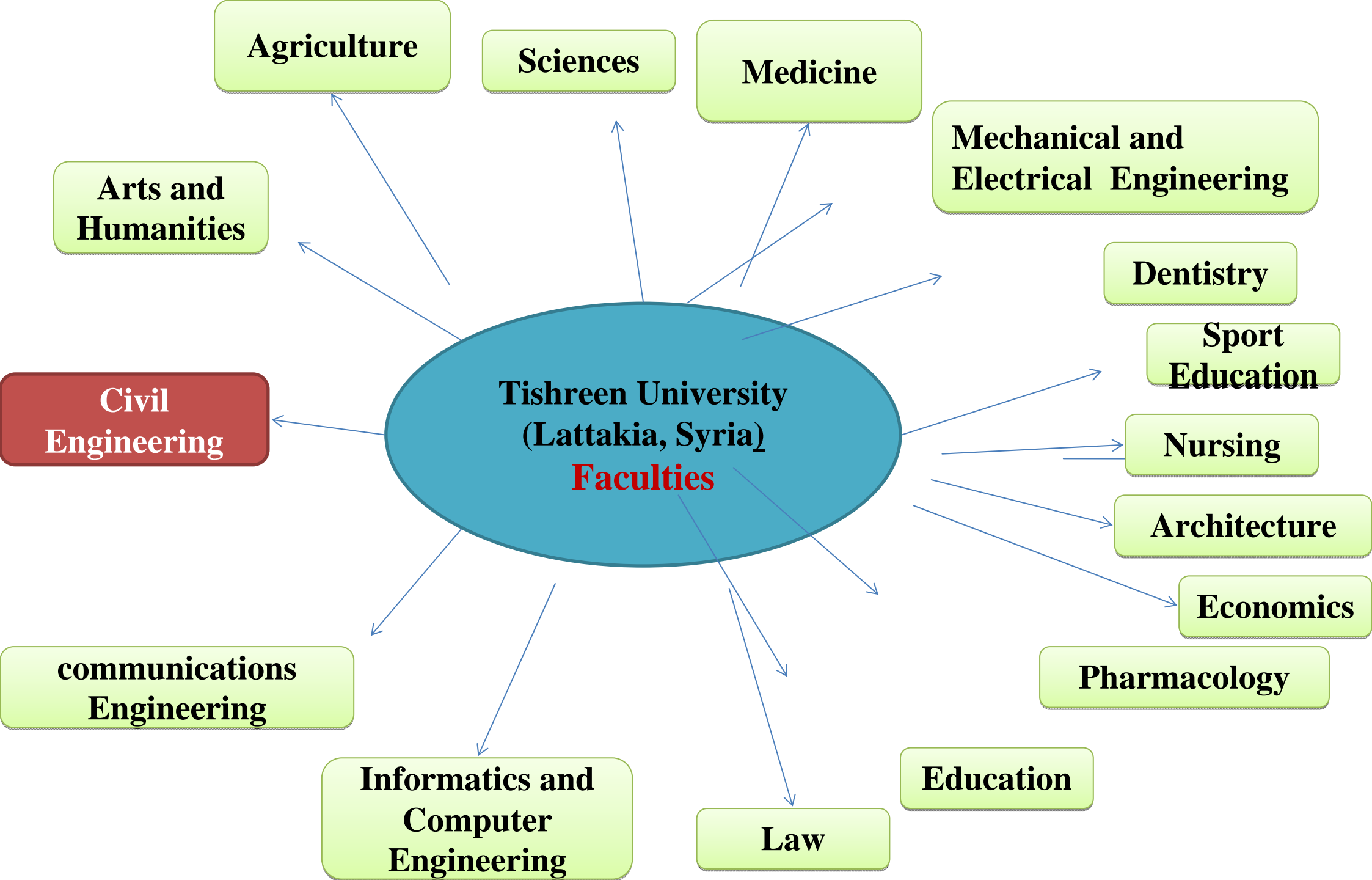
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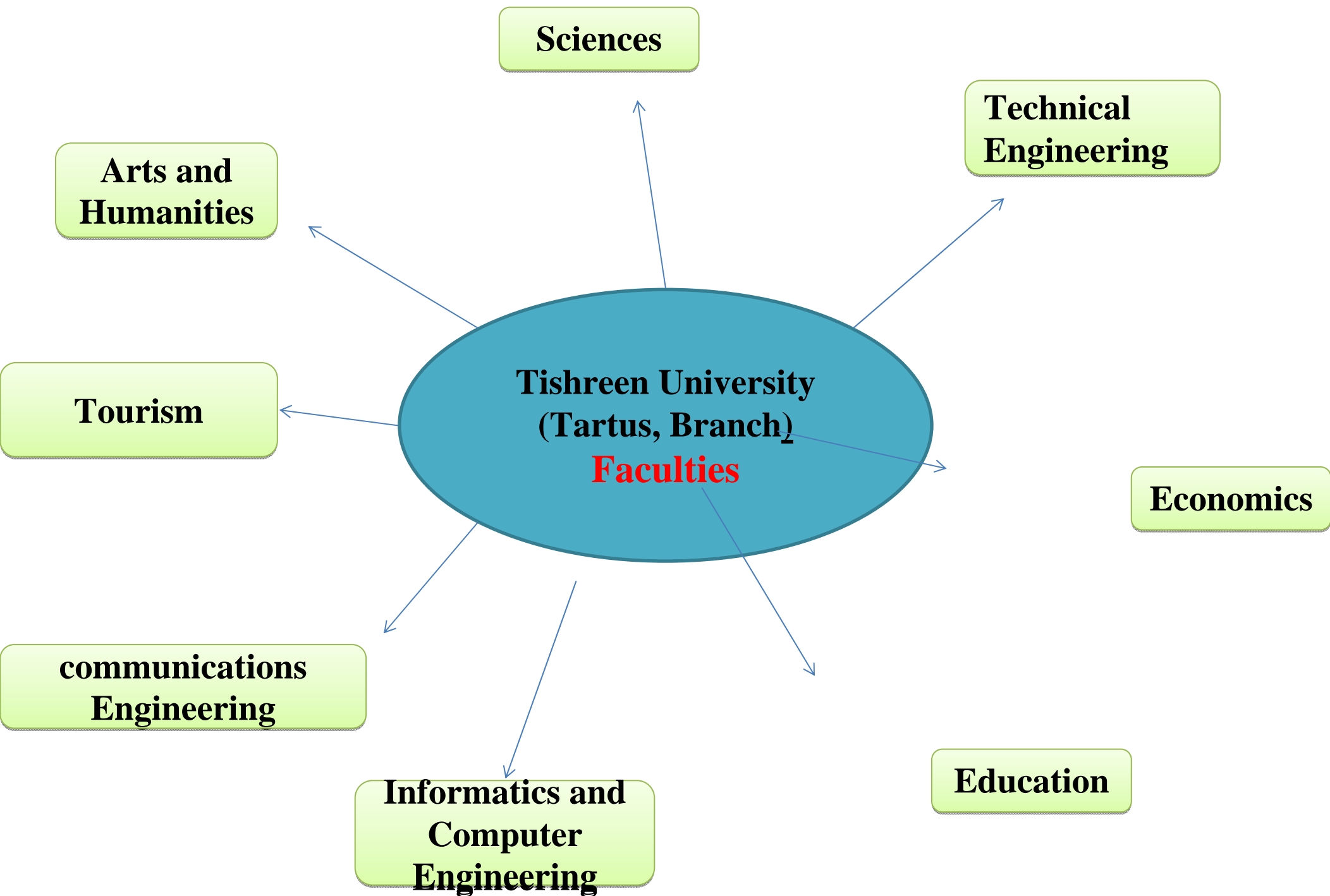
المؤشر 35°31'20.57" شمالاً 35°48'37.04" شرقاً 30 م الارتفاع 2.25 كم ارتفاع الرؤية بالعصى 100% التخطي

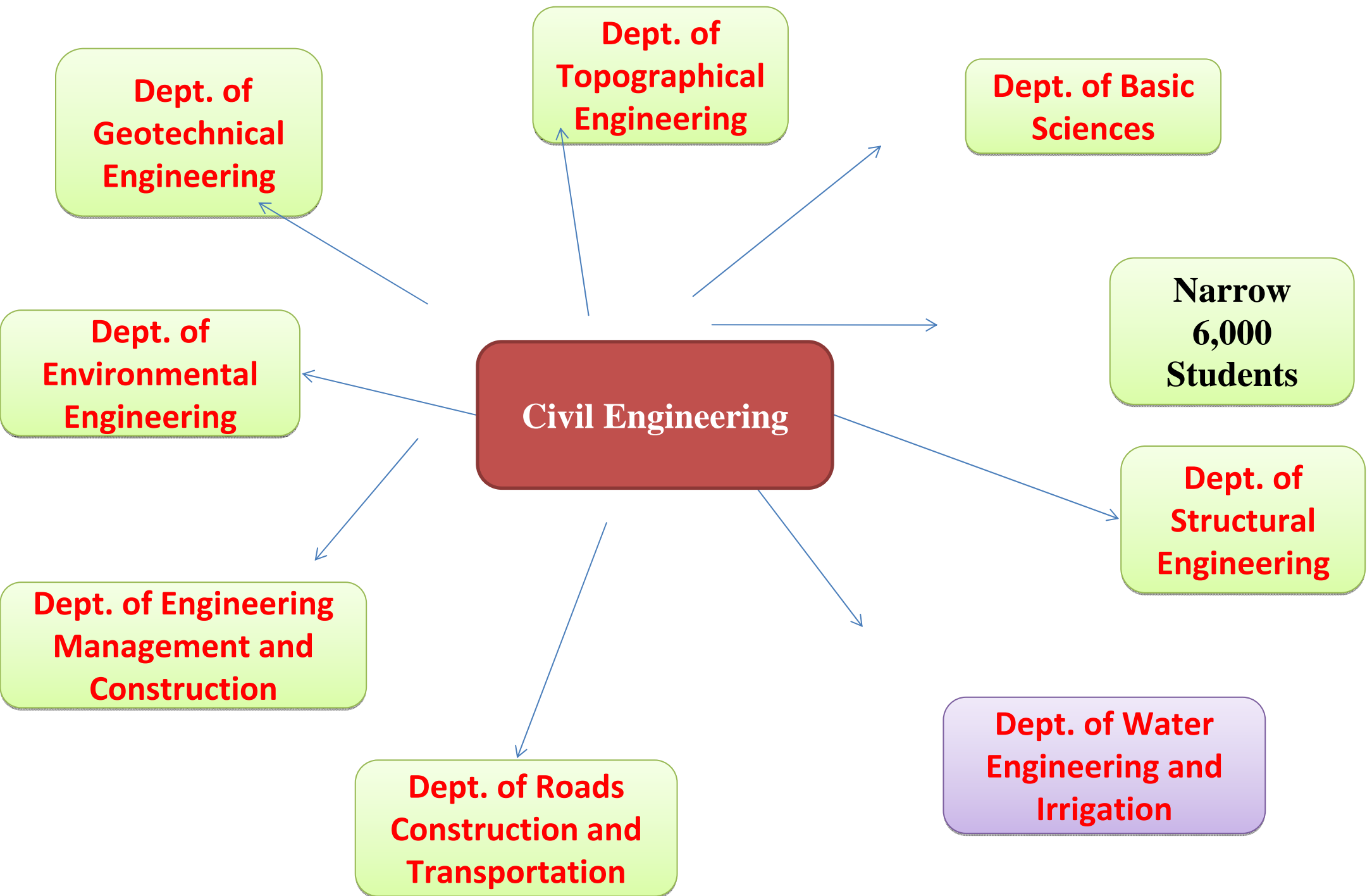
TISHREEN University /Lattakia









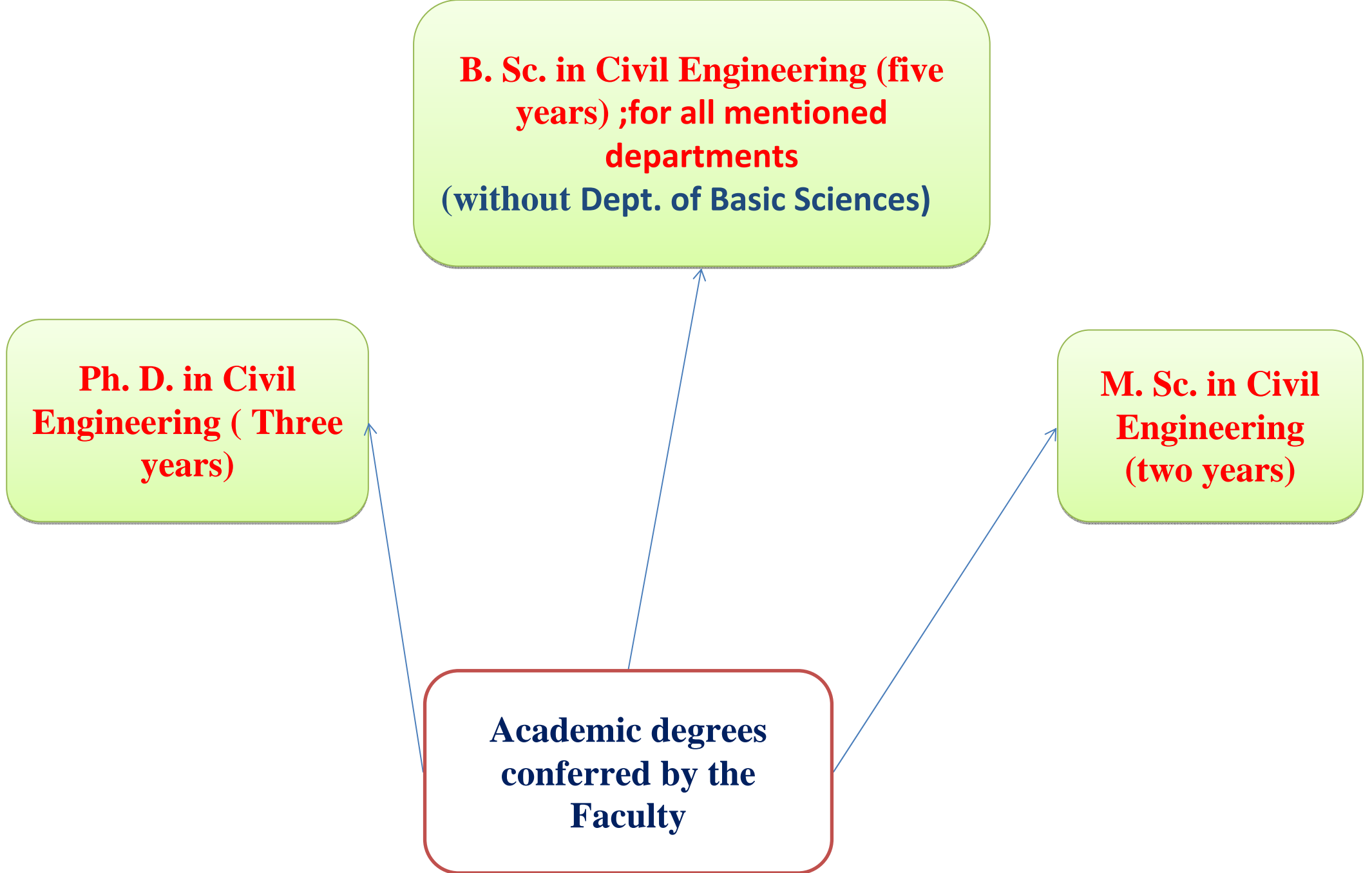


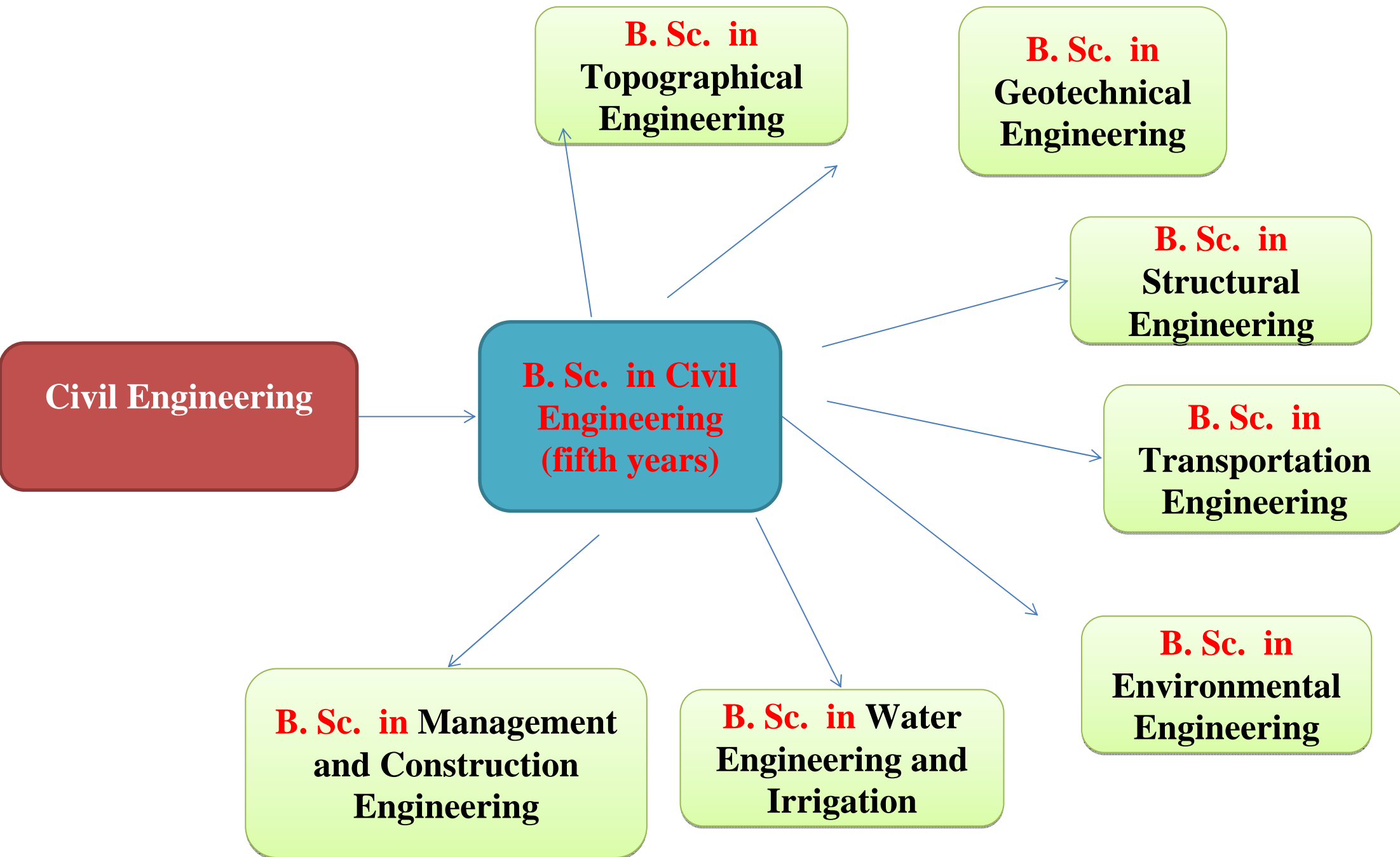
**B. Sc. in Civil Engineering (five years) ;for all mentioned departments
(without Dept. of Basic Sciences)**

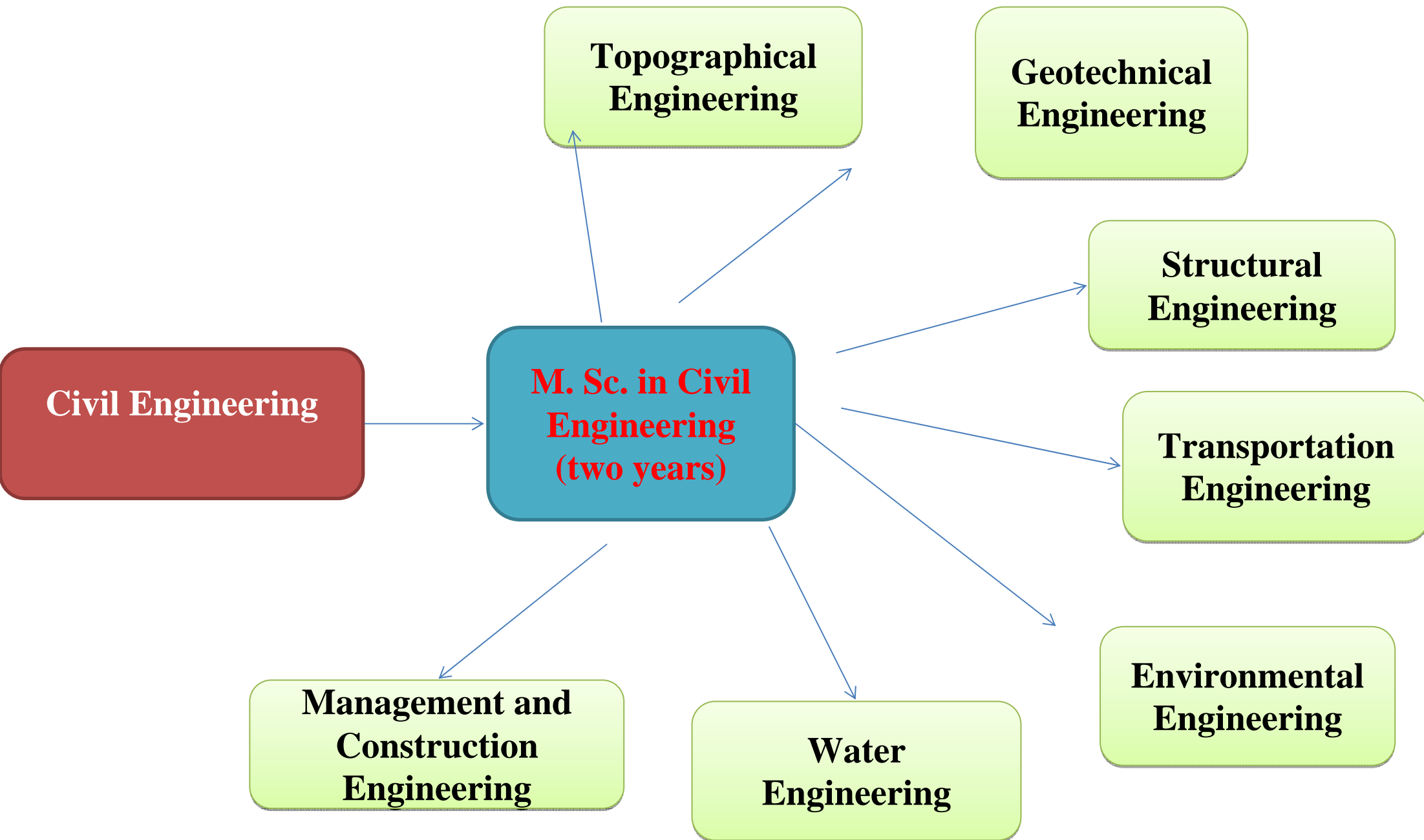
Ph. D. in Civil Engineering (Three years)

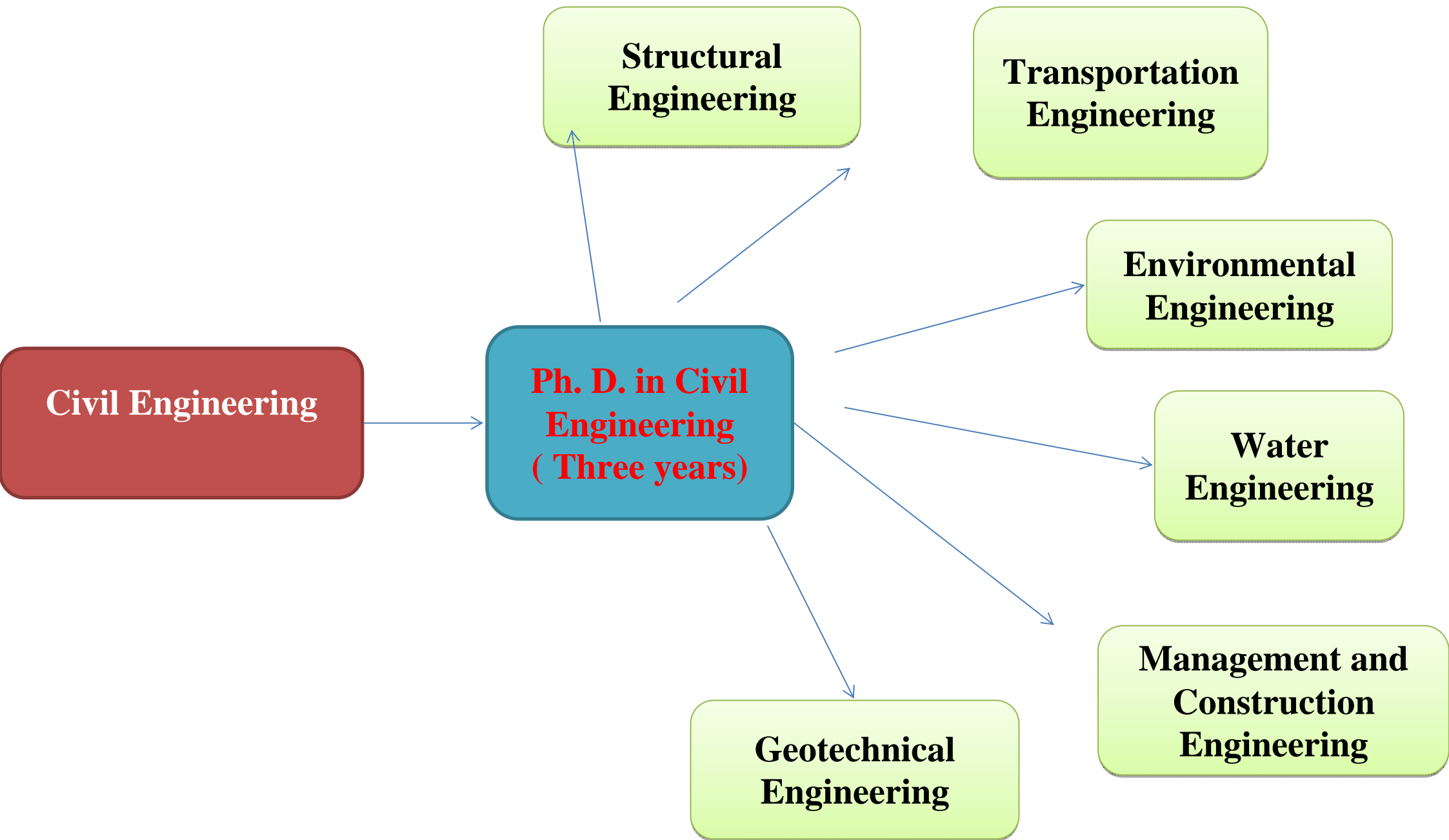
M. Sc. in Civil Engineering (two years)

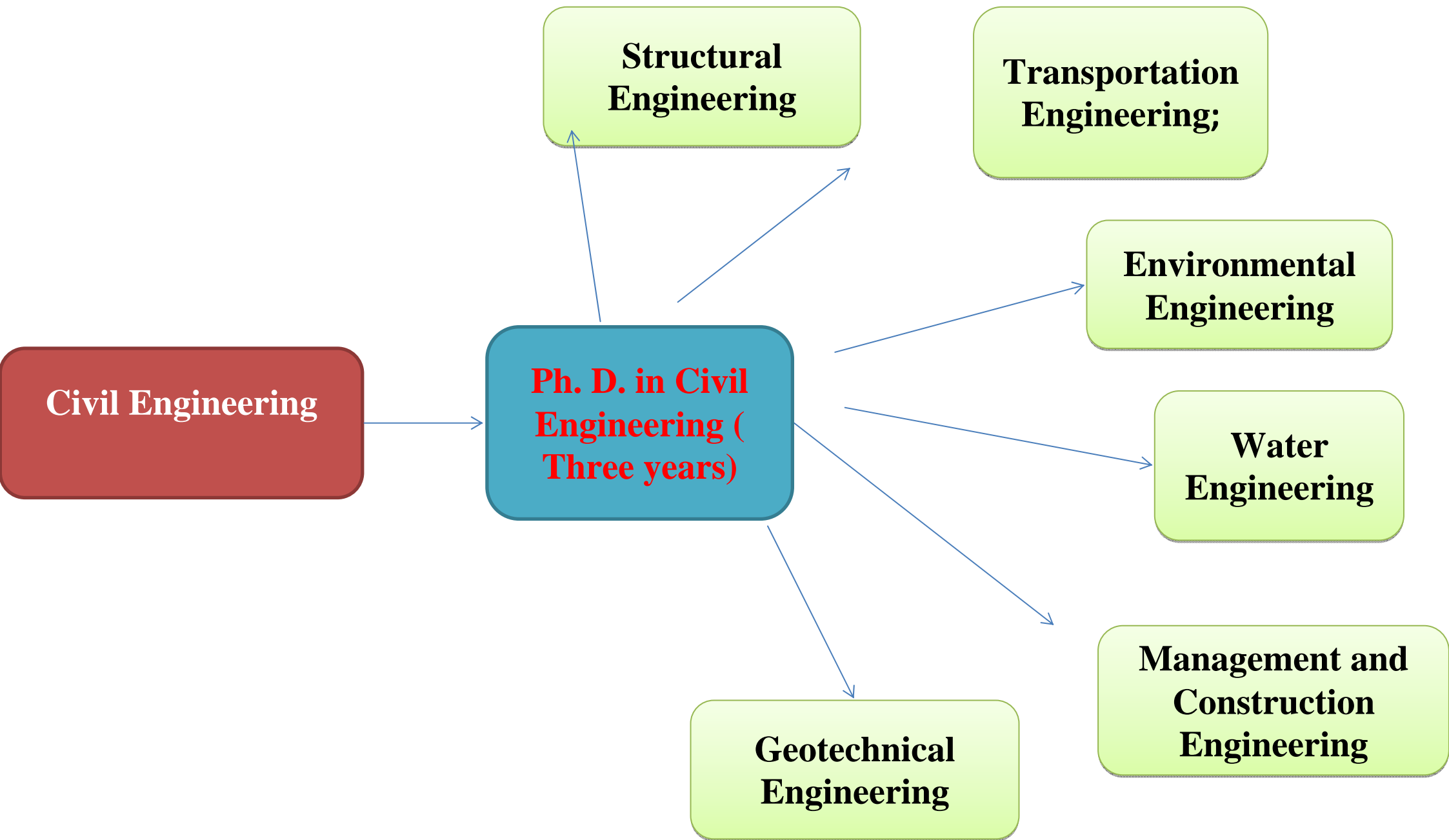
Academic degrees conferred by the Faculty

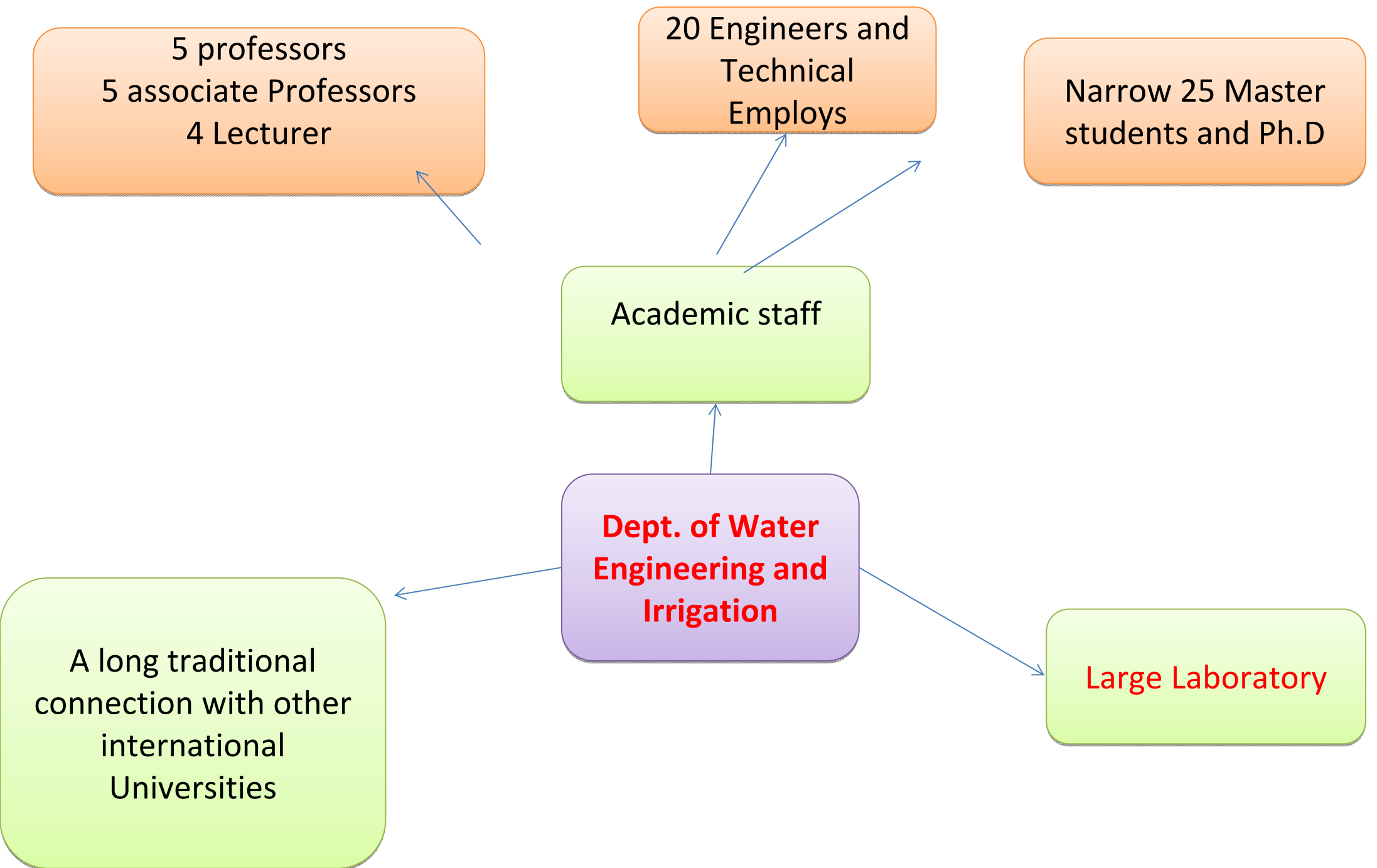


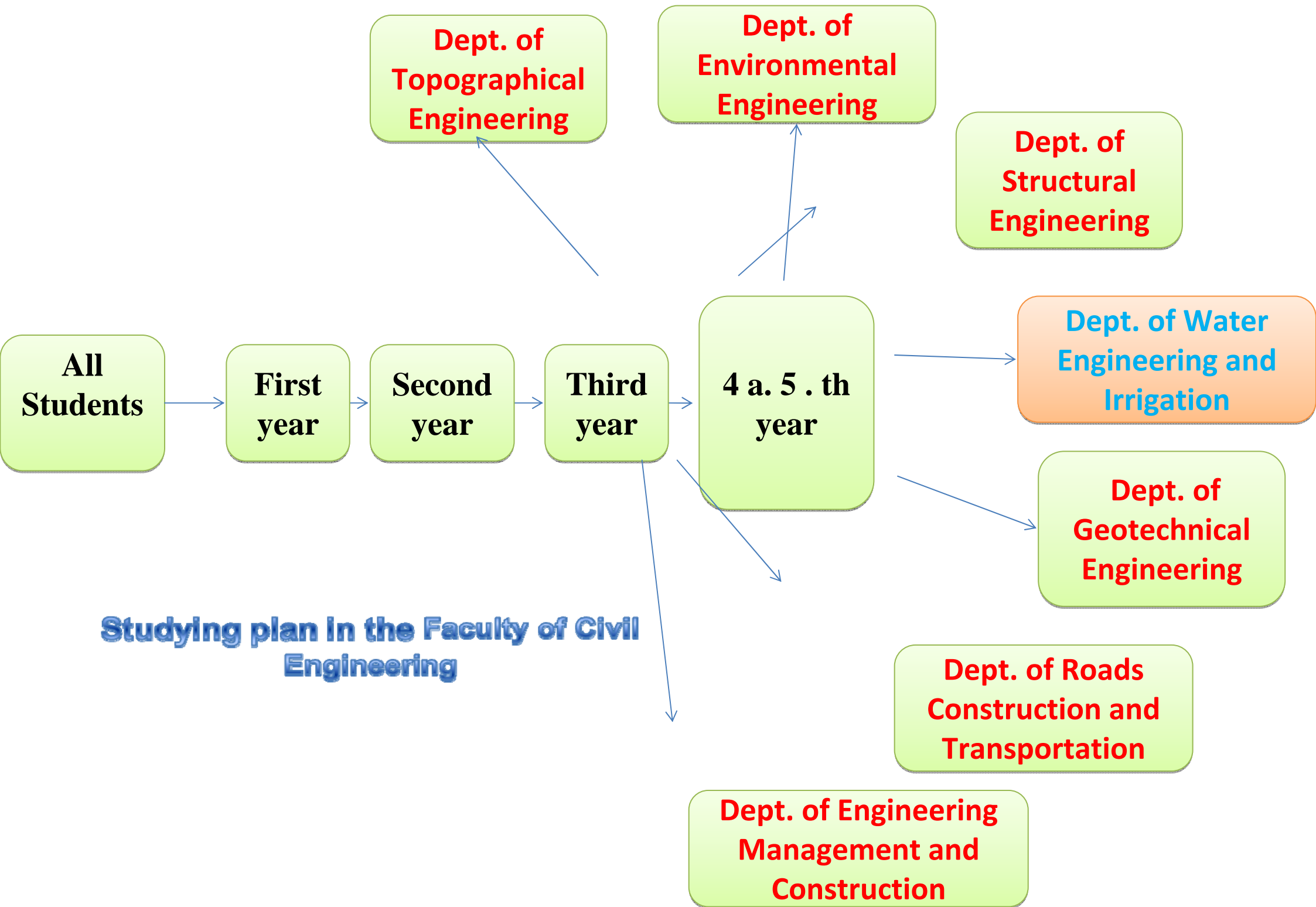












STUDYING PLAN FOR THE FACULTY OF CIVIL ENGINEERING / **FIRST YEAR**

Semester /1/	number of hours		Semester /2/	number of hours	
Courses	Theoretical	practical	Courses	Theoretical	practical
mathematics /1/	3	2	mathematics /2/	3	3
Mechanical Engineering/1/	3	2	Mechanical Engineering/2/	3	2
Physics /1/	3	2	Physics /2/	3	2
Basics of informatics/1/	1	3	Basics of informatics/2/	1	3
Geometrical Representation/1/	1	3	Geometrical Representation/1/	1	3
Arabic language/1/	4	-	culture of national socialism	2	-
foreign language/1/	4	-	foreign language/2/	4	-
Total	19	13	Total	17	13

STUDYING PLAN FOR THE FACULTY OF CIVIL ENGINEERING / **SECOND YEAR**

Semester (1) Courses	number of hours		Semester /2/ Courses	number of hours	
	Theoretical	practical		Theoretical	practical
mathematics /3/	3	2	mathematics /4/	3	2
Mechanics of material /1/	3	3	Mechanics of material /2/	3	3
hydrology	2	2	chemistry	2	2
Construction of buildings and equipments /1/	1	3	Construction of buildings and equipments/2/	1	3
Building Materials /1/	2	2	Building Materials /2/	2	2
Engineering geology /1/	2	2	Engineering geology /2/	2	2
foreign language/3/	4	-	foreign language/4/	4	-
Total	17	14	Total	17	14

STUDYING PLAN FOR THE FACULTY OF CIVIL ENGINEERING / **THIRD YEAR**

Semester (1) Courses	number of hours		Semester /2/ Courses	number of hours	
	Theoretical	practical		Theoretical	practical
mathematics /5/	3	2	Operations Research	3	3
Analysis and design of construction /1/	3	3	Analysis and design of construction /2/	3	3
Technology of Building materials	2	2	Construction Technology	2	2
Principles of Geotechnical Engineering /1/	2	2	Principles of Geotechnical Engineering /2/	2	2
Mechanics of fluids /1/	2	3	Mechanics of fluids /2/	3	2
Transportation Engineering and Transport	2	2	Basics of Environmental Engineering	2	2
Surveying /1/	2	2	Surveying /2/	2	2
Total	16	16	Total	17	15

STUDYING PLAN FOR THE DEPARTMENT OF WATER ENGINEERING AND IRRIGATION / **FOURTH YEAR**/

Semester /1/ Courses	number of hours		Semester /2/ Courses	number of hours	
	Theoretical	practical		Theoretical	practical
Hydraulics /1/	3	2	Hydraulics /2/	3	2
Engineering Hydrology	3	2	Hydrogeology	3	2
Concrete of Hydraulic Structures	3	2	Harbour Engineering/1/	3	2
Irrigation	3	2	Drainage and Land reclamation	3	2
Hydraulic Structures /1/	2	3	Hydraulic Structures/2/	3	2
Soil and water chemistry	3	2	Foundation of Hydraulic Structures	2	2
Total	17	13	Total	18	12

STUDYING PLAN FOR THE DEPARTMENT OF WATER ENGINEERING AND IRRIGATION / **FIFTH YEAR**/

Semester /1/ Courses	number of hours		Semester /2/ Courses	number of hours	
	Theoretical	practical		Theoretical	practical
Dams /1/	3	2	Dams /2/	3	2
Pumping stations and Hydraulics Machines	3	2	Beaches protection Engineering	3	2
Harbour Engineering/2/	3	2	Water resources development and advanced technologies	3	2
Irrigation Networks	2	2	Bachelor Project	-	6
Engineering management and Economics	2	2			
Bachelor Project	-	6			
Total	13	16	Total	9	13

Master study

Studying Plan for the Department of Water Engineering and Irrigation / Year/ Courses throughout the year

Semester /1/ Courses	number of hours		Notes
	Theoretical	practical	
Methods of scientific research	1	1	Compulsory
Advanced Mathematics	2	2	Compulsory
Advanced Hydraulics	2	1	Compulsory
River and buried Construction	2	1	Optional
Sea an Beaches Construction Engineering	2	1	Optional
Dams	2	1	Optional
Advanced Hydrology	2	1	Optional
Mathematical and physical Modeling of Hydraulic Structures	2	1	Optional
Beaches Hydrodynamics and Movement of sediments	2	1	Optional
Irrigation and Drainage and Land Reclamations	2	1	Optional

Notes

Every lecturer put suitable subjects of the course according to the development of the situation in the Bachelor courses.

the contents of The courses , which are lectured in
the Department of Water Engineering and Irrigation

Minimum content of courses

Course Name /**Hydrology**/ **second year** / **Semester** /1/ **Theoretical** /2/ **Practical**/2/

Air and climatic phenomena;
Evaporation; Water Shed; Hydrograph;
Statistics and probability in hydrology;
runoff and Floods ;urban and small
watershed hydrology ; Physical and
chemical properties of groundwater;
origin of groundwater and forms of its
exists in the earth crust ;principles of
Groundwater flow.

Course Name / mechanics of Fluids/1/

/ thlrd year / Semester /I/ Theoretical /2/

Practical/3/

Introduction to fluid mechanics; stillness of fluid (hydrostatic); basics of dynamics of fluid mechanics (basic concepts of kinematics and dynamic fluids); power loss (head loss) in the situation of steady flow of liquids; hydraulic resistance.

Course Name / mechanics of Fluid /2/

/ thlrd year / Semester /2/ Theoretical /2/

Practical/3/

Steady water flow in pressured pipes; unsteady water flow in pressured pipes; flow of liquids through openings and orifices; free water Jets; free, steady and regular water flow in open canals; free, steady and irregular Water Flow in open canals.

Studying Plan for the Department of Water Engineering and Irrigation / fourth Year/

Courses of Semester /1/ 4.th year

Course Name / Hydraulics /1/ / fourth year / Semester /1/ Theoretical /3/ practical/2/

Water jump; unsteady flow in open canals, weirs; connection structures and energy depression; spillways ; aqueducts; Laboratory experiments; computing programs about this subjects.

Courses of Semester /1/ 4.th year

Course Name / Engineering hydrology

/ fourth year / Semester /1/ Theoretical /3/ practical/2/

Calculation of maximum floods with statistical methods; flood routing; studying of sediments; use of nuclear technologies in hydrological studying and water sciences; application of remote sensing in hydrology; marine hydrology; Hydrology of Swamps ,Lakes and basins; urban and small watersheds hydrology; Hydrological modeling; Hydrological design.

Courses of Semester /1/ 4.th year

Course Name / Concrete of Hydraulic Structures

/ fourth year / Semester /1/ Theoretical /3/ practical/2/

Reinforced concrete; physical properties, mechanical resistance, design aggregates, concept of reinforced concrete, deformations stress situation, allow strains, critical situation, loads and safety factors, standard resistances, resistances characteristics and Safety factors; elements subjected under central pressure items; elements subjected under central tension items; central controlled tensioning elements; elements subjected under Moment; ; elements subjected under shear; continuing beams; slabs , which operate in two directions; Pipes from reinforced concrete , water reservoirs; canals from reinforced concrete (opened, hanged, flume, chute, crossing structures, bridges ,culverts.

Courses of Semester /1/ 4.th year

Course Name / Irrigation

/ fourth year / Semester /I/ Theoretical /3/ practical/2/

Studying and researches needed to land reclamation; relationship between soil, water and plants; water demands of agriculture crops; irrigation system, choosing of calculation year; method of surface irrigation; method of sprinkler irrigation; method of drip irrigation; evaluation of irrigation systems (technical and economical); basics of calculation of irrigation networks (open canals and pressured pipes); sources of Irrigation water; irrigation from local water; irrigation from treated sewage water; regulating of agriculture lands; soil erosion and conservation of nature and the environment.

Courses of Semester /1/ 4.th year

Course Name / Hydraulic structures /1/

/ fourth year / Semester /I/ Theoretical /3/ practical/2/

Classification of hydraulic structures; work and design; water seepage through foundations of hydraulic structures and bypass seepage; canals, regulation structures; water conveyance structures; hydraulic tunnels; connection structures (Falls and drops); gates.

Courses of Semester /1/ 4.th year

Course Name **Soil and water chemistry**

/ fourth year / Semester /1/ Theoretical /2/ practical/2/

Soil chemistry; installation and chemistry of soil minerals; soiled phase; components of soil; liquid phase; gas phase ; soil problems and treatment; desertification; the phase, desertification, soil alkalinity and acidity, salinity, land salinity reclamation of salt land, reclamation of alkaline land; soil water relationship; the influence of rainfall on the soil; soil corrosion.

Water chemistry; distributes water on the land; the natural water cycle, water-physical properties; water sources, water types, some of the chemical properties of water; drinking water; drinking water purification methods; sterilization; swimming pool water purification; desalination; wastewater treatment; industrial wastewater treatment; water analysis.

Chemical influence of soil and water on the concrete ; building materials chemistry; concrete components; chemical composition of concrete; types of concrete corrosion; chemical media causing corrosion; concrete corrosion resulting from contact with sea water; prevention of corrosion of the reinforced concrete; methods of analysis of soil and water.

Courses of Semester /2/ 4.th year

Course Name Hydrogeology

/ fourth year / Semester /II/ Theoretical /3/ practical/2/

Physical and chemical properties of groundwater; origin of groundwater and its forms in the earth crust; groundwater flow laws ;steady groundwater flow into homogeneous aquifers ; steady groundwater flow into no homogeneous aquifers ; groundwater flow in the unsaturated media; groundwater investigation; field infiltration tests; pumping tests and analyzing it's data; hydraulic and design of wells; artificial recharge of groundwater; protect the groundwater from pollution und depletion; principles of groundwater modeling; groundwater resources management; hydro geological investigations and investment of groundwater ; sea-water intrusion with fresh groundwater.

Courses of Semester /2/ 4.th year

Course Name **Hydraulic/ 2/**

/ fourth year / Semester /II/ Theoretical /3/ practical/2/

Boundary flow and its application in water engineering; principles of hydraulics geometric similarity; principles of theoretical modeling of hydraulic phenomena; two-and three-dimensional flow and its application; wind waves; Laboratory experiments; computer applications in hydraulic.,

Courses of Semester /2/ 4.th year

Course Name **Hydraulic structures/ 2/**

/ fourth year / Semester /II/ Theoretical /3/ practical/2/

River streams regulation; river water intakes; Water intakes not containing dams; Water intakes containing dams; deep water intakes; infiltration water intakes; deposition basins; deposition basins of periodic washing; sedimentation basins with permanent washing; water reservoirs (Lakes) and water knots planning; methods of construction and investments processes in hydraulics structures.

Courses of Semester /2/ 4.th year

Course Name Foundations of water structures

/ fourth year / Semester /II/ Theoretical /3/ practical/2/

Geotechnical investigations; types of foundations; soil sustainability of surface foundation; Soil settlement of foundation; design of surface foundations; deep foundations; piles; Wells ; improve of foundation.

Courses of Semester /2/ 4.th year

Course Name: Drainage and land reclamation

/ fourth year / Semester /II/ Theoretical /3/ practical/2/

General concepts of drainage and land reclamation; salinity in agricultural soils; saline soils remediation methods; horizontal drainage of irrigated land; vertical drainage of irrigated land; regulation of drainage collectors stream.

Courses of Semester /2/ 4.th year

Course Name: Harbour Engineering /1/

/ fourth year / Semester /II/ Theoretical /3/ practical/2/

Specifications technical harbour; general information depths ; ground level harbour ; harbour square dimensions; economical navigational harbour specification , capacity of a quay; harbour planing and construction, choose where to build the harbour, factors affecting harbours layout, harbour areas, distribution of quays and breakwater facilities in the layout; wind waves system in harbour and wave pressure; sea navigational channels; storing houses and buildings in the harbour; water, sewage and electricity networks in the harbour; the main basics of water harbour facilities design ; forces acting on sea installations; calculating marine installations with critical method ; loading capacity calculation ; calculation of deformations and stability; breakwater facilities; vertical protection facilities; oblique protection installations; other types of protective installations.

Courses of Semester /1/ 4.th year

Course Name: Dams /1/

/ fifth year / Semester /1/ Theoretical /3/ practical/2/

Classification of earth dams; characteristics; location of the construction of the dam ; design elements of the dam; banks ; strengthening slope; leakage in earth dams; properties; choose of its construction location; design of the dam elements; drainage; slopes reinforcement; elements of waterproof (impermeable elements) ; hydraulic calculation of earth dams (methods of hydraulic calculations; hydrodynamic electrical similarity; flow, draw and curve saturation; Stability of earth dams slopes and calculation of settlement; Stone and earth dams and stone dams; other types of earth dams; earth dams provided with weir; water intake in the earth dams; water intakes as pipes and tower; water intakes without tower, water intakes as tunnel; spillway of earth dams(insides, pipes, tunnels. Siphons).

Courses of Semester /1/ 4.th year

Course Name: Harbour Engineering /2/

/ fifth year / Semester /1/ Theoretical /3/ practical/2/

Sea quays; classification, acting forces, design characteristics; sea gravity quays; quays from thin walls, thin walls calculation not provided with twitter; thin walls calculation provided with twitter; sea quays installed on piles; anchor installation and quays protection from shocks; Landing area outside basin; calculation of anchor installation and protection; Container handling; General information about building institutions and ships repair; gliders, design of basics elements, determine of loads and calculation of ships draw railway; ships docks, basics elements; chambers of Dry docks, gates, equipment, dimensioning, the hydraulic calculation of loading and discharging systems (cranes), static calculation ; floating quays; methods of control and test facilities in the harbour and in nature; strengthening and rehabilitation and repair of sea plants; Types and material of construction; the protection of water against pollution.

Courses of Semester /1/ 4.th year

Course Name: Hydraulic machines and pumping stations

/ fifth year / Semester /1/ Theoretical /3/ practical/2/

hydraulic machines ; potential energy; basic equation of pumps; types of pumps; parts of centrifugal pump; characteristic curves of pumps; working and connection of pumps; pumping pipes; Pumping stations; water hammer and cavitations; used measurement instruments; renewable energy; hydroelectrical power plants; turbines; power generation and environment.

Courses of Semester /1/ 4.th year

Course Name: Irrigation Networks

/ fifth year / Semester /1/ Theoretical /2/ practical/2/

Irrigation networks; planning of irrigation and drainage networks; water loses and water output of Irrigation network, classification of distribution networks; regulation of water flow in irrigation networks; mathematical models in Irrigation networks; lining of irrigation canals; maintenance and exploitation of irrigation networks.

Studying Plan for the Department of Water Engineering and Irrigation / fourth Year/

Courses of Semester /1/ 4.th year

Course Name: Engineering management and Economics

/ fifth year / Semester /1/ Theoretical /2/ practical/2/

Belong to Dept. of Engineering Management and Construction

Courses of Semester /2/ 4.th year

Course Name: Dams /2/

/ fifth year / Semester /II/ Theoretical /3/ practical/2/

Concrete dams; general information; classification; characteristics; influence forces; gravity concrete dams; cross section; design of dams body ; design of the elements of waterproof (impermeable elements); strengthening body dam and soil foundation; continues deformation joints; temporary construction joints; methods of calculation gravity dams on rocky earth; calculation of stress situation; calculating of stability to displacement; ways to reduce the cost of gravity dams; concrete dams provided with weirs; basic types and their schemes; design and its component elements; design of the under cascade; design of Concrete dams provided with weirs; connect it with the sea coast and with earth dams; control and maintenance and repair of concrete dams.

Courses of Semester /2/ 4.th year

Course Name: Beaches protection Engineering

/ fifth year / Semester /II/ Theoretical /3/ practical/2/

Introduction to coastal processes: sediment characteristics and analysis; beach profiles and profile change; long – terms processes; Hydrodynamics of the coastal zone; tides and storm surges; waves and wave – induced hydrodynamics; coastal response; field measurement techniques and analysis; equilibrium beach profiles; sediment transport and rates; miscellaneous coastal features; shoreline modification and analysis; beach nourishment and soft engineering structures; hard engineering structures; shoreline management.

Courses of Semester /2/ 4.th year

Course Name: Water resources development and advanced

technologies / fifth year / Semester /II/ Theoretical /3/ practical/2/

Water resource development systems; analysis and planning of water resource systems; assessment and checking of plans of management of water resources; water resources planning in conditions of insufficient information; water resources planning objectives; water quality; water harvesting; wastewater reuse; reuse drainage water; specific river basin modeling, the artificial river runoff, river basin planning models, planning activated irrigation operation, forecasting and modeling of water quality.

Advanced technologies of water basins; automation and control the sources of drinking water and irrigation using artificial intelligence programs; new techniques for reducing losses in drinking and irrigation; evaluation of the environmental impact of water projects; assess the risk of collapse of important aquatic facilities.