



## Program Specification

### 1. Program Introduction/Description

This program is designed to provide in-depth theoretical knowledge and research in Highways and Traffic Engineering field. Courses encompasses the cores and electives, which mainly on urban transportation planning, advanced traffic engineering, advanced Geometric design of Highways structures, advanced flexible & rigid pavement and Airport design and planning.

### 2. Program Identification and General Information

Program Title	Master of Science in Highways and Traffic Engineering
Awarding Institution	Sana'a University
Department	Department of Civil Engineering
Other Departments with major Teaching Contributions	-
Language of study	English Language.
Date of Specification Preparation/Revision	June 2022
Mode of Study	Full time
Study System	Courses & Thesis
Main Location of Study	Faculty of Engineering/Sana'a University
Mode of Delivery	Full-time
Study Duration	Minimum: 2 Academic years (Two terms each, full-time) Maximum: 3 Academic years (two terms each - full time)
Award(s) or Final Award	Master of Science in Highways and Traffic Engineering
Qualification required to join the program:	BSc. in Civil Engineering or any other equivalent field
Minimum grade requirements to enroll in the program	Good 65%
Other admission requirements	Detailed below
Name of the program coordinator	Dr. Abdullah Ahmed Al Msawari Dr AbdIslam Mohamed Al Thawr
Approval date:	

Head of the Department Dr Abdulkareem Alkhatabi	Quality Assurance Unit Dr Ahmed Mujahed	Dean of the Faculty Dr Abdulah AlMaswari	Academic Development Center & Quality Assurance .....
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### 3. Program Curriculum Committee:

Assoc Prof Abdullah Ahmed Al Msawari Dr. AbdIslam Mohamed Al Thawr	Dr. Mohamed Abdwadood Assoc Prof. Mansour Haidrah Dr. Abdulhakim Nooraddin MSc. Eng. Nabil Alsharajabi
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### 4. Vision, Mission & Aims of the University

<b>Vision of the University</b>
Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.
<b>Mission of the University</b>
To contribute to the sustainable development efforts by providing an accredited higher education environment and excellent research services within a fruitful national partnership based on transparency, professionalism and creativity.
<b>Aims of the University</b>
The University seeks to achieve the following objectives:
1. To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:
2. To boost the level and quality of preparation and qualification tasks.
3. To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.
4. To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.
5. To develop innovative and critical scientific thinking skills.
6. To provide students with the required knowledge and scientific and applied skills for solving problems effectively and efficiently.

### 5. Vision, Mission & Aims of the Faculty

<b>Vision of the Faculty</b>			
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To excel in engineering education & scientific research with distinction at the local and regional levels.

### Mission of the Faculty

To provide excellent and accredited engineering education to meet the development needs and match the labor market requirements locally and regionally.

### Aims of the Faculty

1. To offer study programs in various fields of knowledge and equip students with required knowledge and scientific and know-how skills to utilize them in resolving problems effectively and efficiently.
2. To develop positive trends towards engineering science and its accelerating developments and enable students to use the techniques and methods of conducting scientific research in engineering fields.
3. To develop skills of scientific, innovative and critical thinking as well as the concept of continuous self-education.
4. To strengthen scientific ties with national and international colleges, scientific bodies, and research & development centers.
5. To provide technical and specialized studies and consultations to various state bodies and institutions, both public and semi-public, and utilize them in resolving the environment and society issues to promote sustainable development.
6. To develop a spirit of co-operation, group work, effective leadership, sense of responsibility, and ethical commitment.

## 6. Mission & Aims of the Department

### Mission of the Department

To provide students with good quality Civil Engineering education that prepares them to be qualified and committed professionals who could pursue graduate studies and research and play a leading role in the sustainable development of the country and its integration into the regional economy.

### Aims of the Department

1. Provide a high-quality educational experience through an appropriate depth over the full range of core engineering subject areas for undergraduate and postgraduate programs,
2. Applying the quality assurance standards and targeting the academic accreditation levels (local, regional and international levels).
3. Serving the community and labor market needs through the consultancy, research, laboratory tests and training services.

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### 7. Vision, Mission & Aims of the Program

#### Vision of the Program

To be distinguished post-graduate program education & scientific research in Highways and Traffic Engineering, locally and regionally.

#### Mission of the Program

To graduate well qualified post-graduate students in the field of Highways and Traffic Engineering and research through qualified academic program, staff, and suitable infrastructure that meet the development requirements as well as local and regional labor markets.

#### Aims of the Program

1. To provide specialized studies and encourage fundamental and applied research in different Highways and Traffic Engineering disciplines.
2. To bridge the gap between the academic educational and industrial and technological environment.
3. To provide graduates with up-to-date advanced knowledge and skills needed to create high-quality systems, attain the excellence in Highways and Traffic Engineering and solve the technical problems and challenges in Highways construction industry and management.
4. To contribute effectively to the Highways and Traffic Engineering profession by applying ethical practices and communication skills, sharing innovative and clear ideas and pursuing further education through lifelong learning
5. To graduate researchers in Highways and Traffic Engineering disciplines who can pursue further studies and contribute to the scientific research community.

### 8. Program Standards & Benchmarks

#### Program Standards

1. The Quality Assurance Agency for Higher Education (QAA), Subject Benchmark – Engineering 2019.
2. Engineering Technology Accreditation Commission, Accreditation Board for Engineering and Technology (ABET), 2019-2020.

#### Program Benchmarks

1. MSc Transportation Engineering, Alexandria University, Faculty of Engineering, Egypt
2. MSc Transportation Engineering, UTM, Faculty of Engineering, Malaysia
3. M. Tech. in Transportation Engineering, M. S. Ramaiah University of Applied Sciences, Engineering and Technology, Bengaluru, India
4. M.E. in Transportation Engineering, University College of Engineering (Autonomous) Osmania, COLLEGE OF ENGINEERING, Hyderabad, India

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5. MSc Transportation Engineering, Imperial College London, Faculty of Engineering, London, UK
6. MSc civil engineering /Transportation Engineering, Jordan University of Science and Technology, Faculty of Graduate Studies, Jordan
7. MSc Highways and Geotechnical Engineering, Sana'a University, Faculty of Engineering, Yemen.

### 9 Summary of Similar Programs (Benchmarks) for Highways and Traffic Engineering Program

	The Similar Programs (Benchmarks)						7th Program Current Program
	1 <sup>st</sup> Program	2 <sup>nd</sup> Program	3 <sup>rd</sup> Program	4 <sup>th</sup> Program	5 <sup>th</sup> Program	6 <sup>th</sup> Program	
Program Title	MSc. in Transportation Engineering	MSc. Of Engineering in Transportation	M. Tech. in Transportation Engineering	M.E. in Transportation Engineering	MSc in Transportation Engineering	Master Degree in Civil Engineering /ring Transportation Engineering	MSc. in Highway and Geotechnique Engineering
Faculty	Faculty of Engineering	Faculty of Engineering	Engineering and Technology	Collage of Engineering	Faculty of Engineering	Faculty of Graduate studies	<b>Faculty of Engineering</b>
University	Alexandria University	UTM	M. S. Ramaiah University of Applied Sciences	University Collage of Engineering (Autonomous) Osmania University	Imperial College London	Jordan University of Science and Technology	<b>Sana'a University</b>
Country	Egypt	Malaysia	Bengaluru, India	Hyderabad, India	UK	K. Jordan	<b>Yemen</b>
Type of Program	Courses + Thesis	Courses + Pre-Master Project+ Master Project	Courses + Dissertation and Publication	Courses + Pre-Master +Project Master Project	Courses + project/dissertation	Courses + thesis	<b>Courses + thesis</b>

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<b>9 Summary of Similar Programs (Benchmarks) for Highways and Traffic Engineering Program</b>								
Study methods in the program:	Full time	Full time	Full time+ Part time	Full time+ Part time	Full time+ Part time	Full time		Full-time
Number of semesters	3	Maximum = 8			3	Maximum = 8		Maximum = 6 Minimum = 4
Total Credit Hours (without Thesis)	24	36	44	44	60	25		30
No. of Compulsory Courses (with Faculty requirement)	4	8	7	6	12	5		10
Credit Hours for Compulsory Courses	12	30	29	18	36	13		30
No. of Elective Courses	4	2	4	6	4	4		
Credit Hours for Elective Courses	12	6	16	18	24	12		
Complementary courses to join the program and their number								--
Credit Hours for Thesis	8	10	24	24	30	18		6
Total Credit Hours for courses & Thesis	32	46	68	68	90	43		36
The period for thesis completion		14 weeks	2 semesters	2 semesters	1-2 semesters	2 semesters		2-4 semesters
The min. period to complete the program	2 years	3 semesters	4 semesters	4 semesters	2 semesters	Min. 2 semesters		4 semesters
The max. period to complete the program	3 years	8 semesters	6 semesters	6 semesters	6 semesters	Max. 6		6 semesters

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<b>9</b>	<b>Summary of Similar Programs (Benchmarks) for Highways and Traffic Engineering Program</b>							
							semesters	

### 9. Program Intended Learning Outcomes (PILOs)

#### A. Knowledge and Understanding

Upon successful completion of the Master of Science in Highways and Traffic Engineering Program, graduates should be able to:

A1.	Demonstrate in depth understanding of knowledge of applied mathematics and engineering science to the field of Highways and Traffic Engineering.
A2.	Recognize and explain the contemporary engineering technologies and issues in the specialization field of Highways and Traffic Engineering.
A3.	Explain in-depth the principles of sustainable design and development of Highways and Traffic Engineering.
A4.	Acquire advanced knowledge of research principles and methods applicable to the field of work or academic in Highways and Traffic Engineering and related fields.

#### B. Intellectual Skills

Upon successful completion of the Master of Science in Highways and Traffic Engineering Program, graduates should be able to:

B1.	Assess, select and apply appropriate principles, methodologies, techniques, tools and packages in the analysis, specification, development and evaluation of Highways and Traffic Engineering systems.
B2.	Identify, formulate, analyze research and solve complex Highways and Traffic Engineering problems.
B3.	Apply acquired knowledge of analysis and design for complex Highways and Traffic Engineering systems and implementation process.

#### C. Practical and Professional Skills

Upon successful completion of the Master of Science in Highways and Traffic Engineering Program, graduates should be able to:

C1.	Develop research to solve Highways and Traffic Engineering problems.
C2.	Use advanced methodology and skills to solve Highways and Traffic Engineering problems.
C3.	Design Highways and Traffic system, component, or process to meet desired needs within realistic constraints.

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### 9. Program Intended Learning Outcomes (PILOs)

#### D. Key Transferrable Skills

Upon successful completion of the Master of Science in Highways and Traffic Engineering Program, graduates should be able to:

D1.	Prepare a complete thesis and term-courses works/ tasks, write their documents and defend on them.
D2.	Demonstrate ethical principles, awareness of professional and ethical responsibility as well as knowledge of the standards utilized in related fields.
D3.	Conduct independently and communicate research that advances and extends knowledge and scholarship in related fields.
D4.	Own intellectual independence, with initiative and creativity in new situations and/or for further learning, plan and execute original research with full responsibility and accountability for personal outputs.

### 10. Teaching Strategy to Achieve Program Learning Outcomes

ILOs	Teaching Strategy	Assessment Methods
A1	Lectures, Seminars, Active learning, Self-Learning, Independent study, Computer hands-on sessions, Laboratory works	Written Exam, Assignments, Quizzes, Oral discussion, Experimental and field work, Laboratory Report
A2		
A3		
A4		
B1	Lectures, Analysis and Problem Solving, Seminars, Project supervision, Laboratory works, Self-Learning, Simulation exercises, independent study, Brain storming, Research Presentations	Written Exam, Assignments, Quizzes, Course project and Course research, Oral discussion, Experimental and field work, Laboratory Report
B2		
B3		
C1	Lectures, Analysis and Problem Solving, Seminars, Project supervision, Laboratory works, Self-Learning, Simulation exercises, independent study, Brain storming, Research Presentations	Written Exam, Assignments, Quizzes, Course project and Course research, Oral discussion, Experimental and field work, Laboratory Report
C2		
C3		
D1	Dissertation supervision, independent study, presenting reports, Brainstorming, presenting researches, Publish research papers, Survey	Written research proposal, thesis and publication, Written Exam, Assignments, Experimental and field work, laboratory report, survey, presentation, written report.
D2		
D3		
D4		

Teaching Strategy	Description of the Main Strategy Used
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Lectures.	These are interactive lectures weekly conducted according to course plan in a classroom and supported with variety of teaching formats including, lectures and multimedia presentations, use of whiteboard and solved examples, and class discussions, in which concepts, approaches, and case studies are presented, explored, and shown students what they need to know.
Independent study	Independent study is an individualized learning experience that allows students to select a topic focus, define problems or questions, gather and analyze information, apply skills, and create a product to show what has been learned.
Self-Learning.	Students are encouraged to undertake independent study to both supplement and consolidate what are being learned.
Computer hands-on sessions.	Practical applications using a variety of software before the real design and implementation. A variety of web-based searches students will be assigned to learn how they can search for solutions using the Web.
Simulation exercises	Practical applications of software modeling program through modeling of real Highways and Traffic structures.
Analysis and Problem Solving.	The study of Highways and Traffic Engineering involves applying knowledge and problem-based learning. This allows students to become more active in their learning as they work out what information, they need to find out how to solve a particular problem. They can work out a problem collaboratively, practice research as well as testing different components to come up with a valid solution.
Laboratory works.	During laboratory sessions, students will be given experiments to work in groups where they can apply the theories and principles gained. This gives them the opportunity to have hands-on experience to design and conduct experiments in addition to analyzing, interpreting data obtained from experiments, and maximize their learning through actual simulation
Presentations/ Presenting researches	students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Presentation sessions provide an opportunity to address questions, queries, and problems.

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Project supervision	The Lecturer needs to set advance work for students, and then have the students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Project sessions provide an opportunity to address questions, and problems.
Brain storming	Brainstorming is an effective technique for generating lists of ideas and creating interest and enthusiasm for new concepts or topics. Brainstorming provides teachers and students with an overview of what students know and/or think about a specific topic. Students can use brainstorming to organize their knowledge and ideas.
Dissertation supervision	Guiding, reviewing, and approving the MSc research work at all stages.
Publish research	Guiding and reviewing MSc student to write a research paper to be accepted for publication.
Seminar	The Lecturer needs to set advance work for a selected number of students, and then have the selected students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Seminar sessions provide an opportunity to address questions, queries, and problems.
Research activities	Research-led activities envisage activities in which students learn about current research in the discipline and are frequently an audience. The emphasis is put on the research content.
Survey	Searching and investigating previous scientific papers, studies, reports, thesis, case studies.

Assessment Strategy	Description of the main strategy used.
Written Exam	Mid-term test is conducted in the 8 <sup>th</sup> week and final exam is conducted at the end of each course. Both tests are closed or open book, notes and resources. At least two quizzes must be done through the course.
Oral Discussion	To know the knowledge of the students.

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Presentations	For Final Results displaying, to enhance the level of students in different subjects.
Quizzes	The entire assessment of Quizzes activities during the teaching period of each course.
Reports	To demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
Experimental and field work	For evaluation, to demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
Assignments	The entire assessment of coursework activities during the teaching period of each course (which includes group and individual work, tests and presentations, etc.)
Written research proposal	To assess the MSc student ability to commence and conduct his/her research.
Thesis and publications	To assess the entire acquired knowledge and skill through the MSc thesis and publications.

### 1. Intended Learning Outcomes Mapping:

See Annex 10

### 2. Program Structure

Program Requirement	No. of Courses	Credit Hours	%
Complementary Courses	10	30	
Faculty Requirement	٢	6	17%
Compulsory Courses	8	٢٤	67%
Elective Courses			
Thesis	-	6	16%
Total		36	100%

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Complementary Courses (8 courses, 24 CH)							
No	Course Code	Course Title	Lec.	Tut.	Pr.	Total C.H.	Prerequisites
1	CE-THE501	Urban Transportation planning	3	✓		3	
2	CE-THE502	Fixable Pavement Design	3	✓	✓	3	
3	CE-THE503	Advanced Traffic Engineering	3	✓		3	
4	CE-THE504	Geometric Design of Highways	3	✓	✓	3	
5	CE-THE505	Rigid Pavement design	3	✓		3	
6	CE-THE506	Airport Planning and Design	3	✓		3	
7	CE-THE507	Advanced Soil Mechanics	3	✓	✓	3	
8	CE-THE508	Laboratory and softwares modelling	3	✓	✓	3	
<b>Total Credit Hours</b>						<b>24</b>	

Faculty Requirement (2 course, 6 CH)							
No	Course Code	Course Title	Lec.	Tut.	Pr.	Total C.H.	Prerequisites
	FR509	Scientific Research Methodology	3			3	
	FR510	Applied Statistics	3	✓		3	
<b>Total</b>						<b>6</b>	

Elective Courses (.....) (Selected from the courses shown below)							
No	Course Code	Course Title	Lec.	Tut.	Pr.	Total C.H.	Prerequisites

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Elective Courses (.....) (Selected from the courses shown below)							
No	Course Code	Course Title	Lec.	Tut.	Pr.	Total C.H.	Prerequisites
MSc Thesis (6 CH)							
No	Course Code	Course Title	Lec.	Tut.	Pr.	Total C.H.	Prerequisites
	CE-THE511	MSc Thesis				6	
<b>Total</b>						<b>06</b>	

Thesis
The student must prepare and discuss a MSc Thesis by (6) credit hours.
Thesis and Its Requirements (if any)
1. Registration of the thesis:
(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)
<ul style="list-style-type: none"> <li>Completion of all required Courses with average grade more than or equal to 75% .</li> <li>Completion of all university requirements.</li> <li>Field of Research and precise research topic with short Description and suggested time plan.</li> <li>First Department Seminar.</li> <li>Decision letter (Supervisors) of acceptance of the research topic.</li> <li>Thesis work should be done in at least 2-semesters.</li> <li>Thesis work should be done in at most 4-semesters.</li> <li>Any further requirements and controls based on post-graduate deanship regulations.</li> </ul>

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### Thesis

#### 2. Scientific Supervision:

(The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/mechanisms of the scientific supervision and follow-up)

- At most 2-supervisors are selected for the supervision of a thesis.
  - At least 1-Associate (or Full) Professor is appointed as supervisor either from the department or from another department outside the faculty.
  - Any Assistant Professor appointed as supervisor should have at least 4-year experience in the field of research and have published at least one paper.
- Candidates may apply for one-year extension (full-time) for completion of the thesis to the Postgraduate Program Administration at the Faculty of Engineering, which will be granted if the candidate provides a valid reason for extension.

The supervisor responsibilities are - :

- Help and assist the candidate/researcher in preparing the research plan.
- Guide the candidate to adhere to certain standards of academic integrity and research ethics, including combating plagiarism.
- Monthly, follow up and meeting with the researcher (at least one meeting per month) ,
- Guide the researcher at every step to be done during thesis work,
- Write follow-up (progress report) after each meeting
- Write a follow-up (evaluation report) every semesters.
- The supervisor shall submit copies of these reports to the Postgraduate-Program coordinator, the Head of the Department and the Head of the Faculty Post-graduate.
- Write the final thesis acceptance report in order to prepare the final department seminar and then initiating the preparation for thesis presentation, defense and approve.

The candidate/student responsibilities are - :

- Student present his/her accomplishment at the end of every semesters
- plan and actively pursue the research;
- identify and deal with any research-related problems;
- comply with administrative requirement;
- meet ethical guidelines;
- take responsibility for the final form of the thesis
- A thesis or research portfolio is the outcome of independent research, or creative activity conducted under supervision.

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<b>Thesis</b>
<ul style="list-style-type: none"> <li>- The length of a 6 credit hours thesis or research portfolio will be appropriate to the discipline and must not exceed 30,000 words, including bibliography, footnotes or endnotes and essential appendices, unless specific permission has been granted by the Department.</li> </ul>
<b>3.Thesis Defense/Examination:</b>
(The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)
<ul style="list-style-type: none"> <li>- A thesis proceeds for defense following completion of:</li> <li>- At least one research paper is accepted in a journal in the field of research.</li> <li>- Final acceptance letters provided by the supervisor(s) and the department final seminar committee (at least 3-department members)•</li> <li>- The examination committee should consist of - :</li> <li>- One -Associate (or Full) Professor specialized in the field of research from an external university ,</li> <li>- One -Associate (or Full) Professor from the department of electrical engineering in addition to the supervisor of the thesis.</li> <li>- A session for presentation, defense and approval of the thesis should be done based on the following- :</li> <li>- At least two members of the examination committee accept their assignment and reply by acceptance letter and approve the thesis for defense within one month.</li> <li>- The session of defense should be declared within two weeks after receiving of examination committee members' approval letters.</li> </ul>

<b>13.System of Study</b>	
<b>Type of program</b>	Courses + Thesis
<b>Study methods in the program:</b>	Full time
<b>The period to complete the program</b>	Min. 2 Years (4 Terms) Max. 3 Years (6 Terms)
<b>Total Credit Hours for Courses + Research</b>	36
<b>14.Study Plan</b>	
FR stands for Faculty Requirements. CE5XX stands for Civil Department Requirements.	

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First Year				First Semester				Prerequisites
No.	Course Code	Course Name	اسم المقرر	Credit Hours				
				Lec.	Tut.	Pr.	Total C.H.	
1	CE-HGE503	Urban Transportation planning	تخطيط النقل الحضري	3	✓		3	
2	CE-HGE504	Fixable Pavement Design	تصميم لرصف المرن المتقدم	3	✓	✓	3	
3	CE-HGE505	Advanced Traffic Engineering	هندسة المرور المتقدم	3	✓		3	
4	FR501	Scientific Research Methodology	منهجية البحث العلمي	3			3	
5	FR502	Applied Statistics	الاحصاء المتقدم	3	✓		3	
<b>Total Credit Hours</b>							<b>15</b>	

First Year				Second Semester				Prerequisites
No.	Course Code	Course Name	اسم المقرر	Credit Hours				
				Lec.	Tut.	Pr.	Total C.H.	
1	CE-HGE506	Geometric Design of Highways	التصميم الهندسي المتقدم	3	✓		3	
2	CE-HGE507	Rigid Pavement design	تصميم الرصف الصلب المتقدم	3	✓		3	
3	CE-HGE508	Airport Planning and Design	تخطيط وتصميم المطارات	3	✓		3	
4	CE-HGE509	Advanced Soil Mechanics	ميكانيكا التربة المتقدم	3	✓	✓	3	
5	CE-HGE510	Laboratory and softwares modelling	الجزء التطبيقي المعلمي والبرمجي	3	✓	✓	3	
<b>Total Credit Hours</b>							<b>15</b>	

Second Year				First Semester				Prerequisites
No.	Course Code	Course Name	اسم المقرر	Credit Hours				
				Lec.	Tut.	Pr.	Total C.H.	
	CE5xx	MSc Thesis					3	
<b>Total Credit Hours</b>							<b>3</b>	

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## Program Specification

Second Year				Second Semester				
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Tut.	Pr.	Total C.H.	
	CE5xx	MSc Thesis					3	
<b>Total Credit Hours</b>							<b>3</b>	

Elective Courses (Selected from the courses shown below)								
No.	Course Code	Course Name	اسم المقرر	Credit Hours				Prerequisites
				Lec.	Tut.	Pr.	Total C.H.	

### 15. Admission Requirements:

1. Bachelor of Civil Engineering Certificate with not less than 65 % passing ratio, or equivalent.
2. Interview
3. TOEFL / IBT: 60
4. ICDL (Computer Skills):
5. Arabic Language:
6. Student number capacity of 20 students per year
7. Transfer Requirements, and Courses Equivalency
8. Annex -13: shows the Admission Requirements for the Program.

### 16. Graduation Requirements:

Student attendance should not be less than 75%.
Student will graduate after successfully passing the 30 credit hours courses and 6 credit hours Research.
Student must achieve a minimum average score for all courses is 75% degree
Minimum score for any student to pass any credit hours course is 65% degree.
Grading System:
From 90% to 100% of total marks      Excellent
From 80% to less than 90%      Very Good
From 75% to less than 80%      Good
From 65% to less than 75%      Pass
Less than 65%      Poor/Fail

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## Program Specification

### 17. Learning Resources, Facilities, and Equipment for Running the Program

**Learning Resources.**

Policies and Procedure for providing and quality assurance of learning resources textbooks, references and other resource materials, including electronic and web-based resources, Journal Database, etc.

- textbooks, reference

Library upgrading necessary, List of required new publications to be provided by Master Program teaching staff

Electronic Library (Existing, allows access to international research papers and publications).

**Facilities and Equipment**

Policies and Procedure for providing and quality assurance of Facilities and Equipment (Library, laboratories (Highways , material Labs), medical facilities, classrooms, etc.).

**List of laboratories**

Highways Engineering Laboratory (Upgrading necessary)

Material Engineering Laboratory (Upgrading necessary)

Computer Laboratory

### 18. Teaching staff:

	Professor	Associate Professor	Assistant Professor	Technicians Assistants
<b>Required Number</b>				
<b>Available Number</b>		1	3	1
<b>Note:</b>				

### 19. Program Management and Regulations

**1. Program Management**

**1.1 Program Structure**

(Including boards, councils, units, committees, etc.)

Civil Engineering Department Board  
 Postgraduate Studies Administration  
 Vice Dean for Postgraduate Studies  
 College of Engineering Board  
 Vice Presidency of the University for Postgraduate Studies

**1.2 Stakeholders' Involvement**

Describe the representation and involvement of stakeholders in the program planning and development. (Students, professional bodies, scientific societies, alumni, employers, etc.)

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## Program Specification

### 19. Program Management and Regulations

The stakeholders were involved in designing the program, including universities, research centers, the public and private sectors, through their participation in a workshop as well as in responding to and submitting a questionnaire.

### 2. Program Regulations

Provide a list of related program regulations, including their link to online version: admission, study and exams, recruitment, appeals and complaint regulations, etc.)

- Decision of the Presidency of the Council of Ministers No. 40 of 2008
- Decision of the Presidency of the Council of Ministers No. 141 of 2008
- Graduate Studies Guide to Sana'a University

### 20. Evaluation of Program Quality Matrix:

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time

**Note:**

**Evaluation Areas/Aspects** (e.g., leadership, effectiveness of teaching & assessment, learning resources, partnerships, etc.)

**Evaluation Sources** (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others (specify)

**Evaluation Methods** (e.g., Surveys, interviews, visits, etc.)

**Evaluation Time** (e.g., beginning of semesters, end of academic year, etc.)

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University of Sana'a  
 Faculty of Engineering  
 Department: Civil Engineering  
 Title of the Program:

Master of Science in Highways and Traffic Engineering



## Program Specification

### 21. List of Annexes

<b>Annex (1)</b>	Academic Standards Curriculum Criteria of Accreditation Board for Structural Engineering program.
<b>Annex (2)</b>	Survey of names of Similar Accredited Programs at International Universities (Benchmarks) for Structural Engineering Programs.
<b>Annex (3)</b>	Survey of Intended Learning Outcomes for similar Accredited Structural Engineering Programs at International Universities.
<b>Annex (4)</b>	Summary of similar Programs (Benchmarks) for Master of Science in Structural Engineering Program.
<b>Annex (5)</b>	Survey of course names of Similar Programs.
<b>Annex (6)</b>	Survey/Mapping of Vision, Mission and Objectives of similar Accredited Programs at International Universities (Benchmarks) for Masters of Science in Structural Engineering programs.
<b>Annex (7)</b>	Mapping of the mission and objectives of the program with the vision, mission and objectives of faculty, and the university.
<b>Annex (8)</b>	Main Themes/Sub-Themes with Relative weight for Program (if need)
<b>Annex (9)</b>	PILOs Distribution to General Themes for Program (if need)
<b>Annex (10)</b>	Matrix of mapping program P- ILO's with courses
<b>Annex (11)</b>	Mapping the benchmarks with PILO's (if need)
<b>Annex (12)</b>	Mapping Program's Goals with Intended Learning Outcomes

### 22. Attachment of Courses specification and Syllabi of the Program

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