University of Isfahan

Course Outline
Road and Transportation Engineering
Graduate Program

Department of Railway Engineering and Transportation Planning
Faculty of Civil Engineering and Transportation
University of Isfahan

November 2023

Table of Contents

1. Definition and goal

Road and Transportation engineering graduate program is one of the higher education programs that its goal is training skilled experts for road pavement design and familiarity with the pavement management system and the use of new materials and technologies in road construction.

2. Duration of Program and the structure

The average duration of this program is 2 years. Every semester lasts 16 complete weeks of education.

3. Credits

The total number of credits in the master degree program is 32 as described in Table 1.

Table 1. Course credits of Railway Transportation Engineering Graduate Program

No.	Type of courses	Credits
1	Core courses	12
2	Optional courses	12
3	Seminar*	2
4	Thesis	6
Total		32

* All graduate students are required to undertake the “Seminar” as 2 credits of their core curriculum. The purpose of this course is to learn how to research papers in reliable literature sources, review the articles and then submit a written report of the reviewed articles and present it, verbally.

The students should investigate a specific topic under the supervision of their supervisor and, ate the end of the semester, submit their research report to the supervisor, and deliver an oral presentation in front of the supervisor and one faculty professors appointed as a referee.

3.1 Compensatory courses of master degree program:

The graduate of different minors in civil engineering as well as other majors, such as Railway engineering, can continue their master degree in the road and transportation engineering. Therefore, a number of courses should be successfully passed in addition to those listed in Table

1. The compensatory course credits are not count in the transcript. Table 2 shows the list of compensatory courses for graduate program in road and transportation engineering.

Table 2. Compensation courses of MSc program in Road and Transportation Engineering

No.	Course Title	Credits
1	Geometric Design	
2	Pavement Engineering	
3	Traffic Engineering	

3.2 Core and optional courses of master degree program:

The master degree program of Road and transportation engineering has 4 core courses. Table 3 shows the core courses of the master degree program.

Table 4 shows the optional courses of the master degree program. All graduate students of road and transportation engineering can choose their optional courses from Table 4. Students should take 12 credits from the list of optional courses.

Table 3. Core courses of MSc program in Road and Transportation Engineering

No.	Course Title	Credits
1	Advance Pavement analysis and design	3
2	Pavement Technology and Materials	3
3	Advance Geometric Design	3
4	Advance Traffic Engineering	3
Total credits		12

Table 4. Optional courses of MSc program in Road and Transportation Engineering

No.	Course Title	Credits
1	Pavement Management System	2
2	Emulsion Bitumen and Cold Asphalt	3
3	Pavement Laboratory	1
4	Rigid Pavement	3
5	Advance Traffic Planning	3
6	Advance Railway Engineering	3
7	Airport Engineering	3
8	Road Maintenance Management	3

ADVANCE PAVEMENT ANALYSIS AND DESIGN

BASIC INFORMATION

Course prefix, title and semester: Advance Pavement analysis and design

Number of credits: 3

COURSE PREREQUISITES:

- Pavement Engineering

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Ahmad Goli / Dr. Mohsen Aboutalebi
Office location: Faculty of Civil Engineering and Transportation, University of Isfahan, Hezar-Jerib av., Isfahan, Iran.
Phone Number: +98 (31) 37935319 / +98 (31) 37935322
Email Address: a.goli@trn.ui.ac.ir/ m.aboutalebi.e@eng.ui.ac.ir

WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
3 h	-	-	1 h

COURSE OBJECTIVES

The aim of Advance Pavement Analysis and Design is the calculation of road pavement failure probability and road pavement design. Students are expected to become familiar with the following topics:

- ✓ Stress and strain analysis in the flexible and rigid pavement.
- ✓ Calculate traffic and loads on the pavement.
- ✓ Thick design of flexible and rigid pavement layers.
- ✓ Design of asphalt and concrete overlay for existing pavements.

REQUIRED STUDENT RESOURCES

Textbooks and References:

1. Yang Huang. Pavement Analysis and Design (2nd Edition). PEARSON Press, 2012.
2. A.T. Papagiannakis and E.A. Masad. Pavement Design and Materials. John Wiley & Sons, 2008.

Web links: -

Computer Software: KenLayer And KenSlab

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week 16	Topic	Reading /Assignment
1	Introduction and Basic Background	-
2	Analysis of flexible pavement: Stress, Strain, Elastic, Viscoelastic, Static and Dynamic loads on pavement layers	-
3	Analysis of flexible pavement: Stress, Strain, Elastic, Viscoelastic, Static and Dynamic loads on pavement layers	-
4	Investigation of Stress and Strain on One, Two, Three and multi-layers of Flexible Pavement	-
5	Analysis of Rigid pavement: Stress, Strain, Temperature, Moisture, Friction on rigid and flexible foundations.	-
6	Design of Tie bars and Dowel bars in rigid pavement	-
7	Factors affecting road design: Traffic.	-
8	Factors affecting road design: Materials.	-
9	Flexible pavement design by AASHTO and Asphalt Institute method.	-
10	Rigid pavement design by AASHTO method.	-
11	Rigid pavement design by PCA method. (Control of erosion and fatigue)	-
12	Design of pavement Layers with Two-Step method.	-
13	Design of pavement Overlay on the flexible pavement.	-
14	Design of pavement Overlay on the Rigid pavement.	-
15	Identification with pavement failures and their repair method	-
16	System Reliability	-

EVALUATION PROCEDURES AND GRADING CRITERIA

HWs (5%), Project (10%), Midterm (35%), Final (50%)

ATTENDANCE STATEMENT

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SYLLABI ON WEB PAGES

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PAVEMENT TECHNOLOGY AND MATERIALS

BASIC INFORMATION

Course prefix, title and semester: Pavement Technology and Materials
Number of credits: 3

COURSE PREREQUISITES:

-

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Ahmad Goli / Dr. Mohsen Aboutalebi
Office location: Faculty of Civil Engineering and Transportation, University of Isfahan, Hezar-Jerib av., Isfahan, Iran.
Phone Number: +98 (31) 37935319 / +98 (31) 37935322
Email Address: a.goli@trn.ui.ac.ir/ m.aboutalebi.e@eng.ui.ac.ir

WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
3 h	-	-	-

COURSE OBJECTIVES

The aim in Pavement Technology and materials is to get acquainted with new technologies in the field of road engineering. Students are expected to become familiar with the following topics:

- ✓ Knowledge of new technologies and materials in road engineering.
- ✓ Knowledge of new machines and techniques implemented in road engineering.
- ✓ Recognize new asphalts mixture with longer life cycle and more durability.

REQUIRED STUDENT RESOURCES

Textbooks and References:

1. James Speight. Collins. Asphalt Materials Science and Technology. Elsevier Press, 2015.
2. Shin-Che Huang and Hervé Di Benedetto. Advances in Asphalt Materials. Elsevier Press, 2015.
3. The Asphalt Handbook (7th Edition). Asphalt Institute Press, 2007.

Web links: -

Computer Software: -

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week 16	Topic	Reading /Assignment
1	Refining and Production of Bitumen	-
2	Structure and Differences of Bitumen	-
3	Chemistry of Bitumen and Bitumen Classifications	-
4	Tests of Classic and Performance Grade (Bitumen)	-
5	Aggregates (Physical and Chemical Properties) and production	-
6	Asphalt Mix Design (Marshall Method)	-
7	Asphalt Mix Design (Superpave Method)	-
8	Asphalt Production and Asphalt Plant	-
9	Asphalt Compaction and Quality Control	-
10	New Materials in Asphalt Pavement (Slag, Ash and…)	-
11	High-Performance Asphalt (Stone Mastic Asphalt-SMA)	-
12	High-Performance Asphalt (Modified Asphalt)	-
13	Bitumen and Asphalt Modifiers	-
14	Porous Asphalt and Surface Treatment	-
15	New Technology in Asphalt Plant (Batch, Continues and Mobile Plant)	-
16	New Technologies in The Field of Road Engineering Machinery	-

EVALUATION PROCEDURES AND GRADING CRITERIA

HWs (5%), Project (20%), Final (75%)

ATTENDANCE STATEMENT

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SYLLABI ON WEB PAGES

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ADVANCED GEOMETRIC DESIGN

BASIC INFORMATION

Course prefix, title and semester: Advanced geometric design
Number of credits: 3

COURSE PREREQUISITES:

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COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Mohsen Aboutalebi
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WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
3 h	-	-	1 h

COURSE OBJECTIVES

The purpose of this course is to acquaint students with specific topics in geometric design. It is also learning the design principles of intersections and interchange:

- ✓ Introduction and the role of geometric design in transportation.
- ✓ Road mapping, construction and maintenance.
- ✓ Road segmentation and use.
- ✓ Basics of car-based design, design speed and capacity.
- ✓ Geometric design criteria based on visibility distance, superelevation, horizontal curve, longitudinal slope, gradual change of width of road, tunnel and bridges.
- ✓ Transverse section components.
- ✓ Characteristics of freeways, highways and main roads.
- ✓ Principles and components of design of intersections and interchange.
- ✓ Project line design criteria in longitudinal profiles.
- ✓ Geometric design of tunnels and technical buildings.
- ✓ Familiarity with geometric design software.

REQUIRED STUDENT RESOURCES

Textbooks and References:

1. Transportation Officials. *A Policy on Geometric Design of Highways and Streets, 2011*. AASHTO, 2011.
2. Hancock, Michael W., and Bud Wright. "A policy on geometric design of highways and streets." *American Association of State Highway and Transportation Officials: Washington, DC, USA* (2013).

Web links: -

Computer Software: Auto Cad Civil 3D

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week 16	Topic	Reading /Assignment
1	Introduction and the role of geometric design in transportation.	-
2	Road mapping, construction and maintenance	-
3	Road segmentation and use	-
4	Basics of car-based design, design speed and capacity	-
5	Geometric design criteria based on visibility distance, superelevation, horizontal curve, longitudinal slope, gradual change of width of road, tunnel and bridges	-
6	Geometric design criteria based on visibility distance, superelevation, horizontal curve, longitudinal slope, gradual change of width of road, tunnel and bridges	-
7	Geometric design criteria based on visibility distance, superelevation, horizontal curve, longitudinal slope, gradual change of width of road, tunnel and bridges	-
8	Transverse section components	-
9	Characteristics of freeways, highways and main roads	-
10	Principles and components of design of intersections and interchange	-
11	Principles and components of design of intersections and interchange	-
12	Principles and components of design of intersections and interchange	-
13	Project line design criteria in longitudinal profiles	-
14	Project line design criteria in longitudinal profiles	-
15	Geometric design of tunnels and technical buildings	-
16	Familiarity with geometric design software	-

EVALUATION PROCEDURES AND GRADING CRITERIA

HWs (10%), Project (20%), Midterm (35%), Final (35%)

ATTENDANCE STATEMENT

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ADVANCED TRAFFIC ENGINEERING

BASIC INFORMATION

Course prefix, title and semester: Advanced Traffic Engineering

Number of credits: 3

COURSE PREREQUISITES:

-

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Gholamreza Shiran
Office location: Faculty of Civil Engineering and Transportation, University of Isfahan, Hezar-Jerib av., Isfahan, Iran.
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Email Address: gh.shiran@trn.ui.ac.ir

WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
3 h	-	-	1 h

COURSE OBJECTIVES

The course aims to deal with theories of traffic flow and signal operations with application to activated, coordinated, and networked intersections using computerized models employed in various parts of the world. Analysis of arterial/freeway operations techniques including HOV and reverse lanes, ramp metering, freeway surveillance, TSM, demand modification. Evaluation of objectives, measures of effectiveness.

REQUIRED STUDENT RESOURCES

References:

1- Arkatkar, S. S., Volmurugan, S. & Verma, A., *Recent Advances in Traffi Engineering*, Springer, 2018.
2- Wolshon, B., and Pande, A. *Traffic Engineering Handbook*, 7th edition, Wiley, 2016.
3- McShane, W. R., Roess, R.P.and Prassas, E. S., *Traffic Engineering*, 5th edition, 2019.

Web links: -
Computer Software: -

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week	Topic
1	Concepts of traffic engineering, travel demand, transport and L\land use interactions, Trip generation rates, transportation systems management
2	Components of traffic system, user, vehicle, road
3	Characteristics of traffic flow, volume-speed-density, uninterrupted traffic flows, interrupted traffic flows
4	Parking studies, parking features, types of parking design
5	Pedestrians, Pedestrians flow features, Volume-velocity-density relationships for pedestrian flows
6	Capacity analysis, base capacity in ideal conditions, level of service, capacity in two-lane highways, capacity on multi-lane highways, volume to capacity ratio
7	Freeway systems, freeway components, control, access, safety elements, geometric design elements, calculation of capacity and flow service volume
8	Intersection capacity analysis, intersection characteristics, speed-volume-density under ideal conditions, level of service criteria
9	Rural highways, types and tasks, uninterrupted flow with periodic interruptions
10	Capacity analysis of rural highways, capacity in multi-lane highways, capacity on two-lane highways
11	Principles of intersection traffic signal installation, phasing Principles, critical legs, intersection delay, performance criteria, effects of left turns, entries & exits; Analysis of signalized intersections, concepts of capacity and level of service, lane group selection, Highway Capacity Manual Guide 1985, signal timing
12	Application and performance of detectors and other ITS systems
13	Queueing theories in traffic; Shock-wave theories in traffic and traffic jams
14	Types of grade-separated intersections, performance, applications and design
15	Traffic simulation software - How to use (Synch Row ALMSUN)
16	Methods of optimizing traffic systems and traffic control (RAMP METERING)

EVALUATION PROCEDURES AND GRADING CRITERIA
Home works (10%), Project (20%), Midterm (20%), Final (50%)

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EMULSION BITUMEN AND COLD ASPHALT

BASIC INFORMATION

Course prefix, title and semester: Emulsion Bitumen and Cold Asphalt
Number of credits: 3

COURSE PREREQUISITES:

-

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Ahmad Goli/ Dr. Mohsen Aboutalebi
Office location: Faculty of Civil Engineering and Transportation, University of Isfahan, Hezar-Jerib av., Isfahan, Iran.
Phone Number: +98 (31) 37935319 / +98 (31) 37935322
Email Address: a.goli@trn.ui.ac.ir/ m.aboutalebi.e@eng.ui.ac.ir

WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
3 h	-	-	1 h

COURSE OBJECTIVES

The aim in Emulsion Bitumen and Cold Asphalt Understanding the details of emulsion bitumens and their types and the difference between hot and cold asphalt and cold asphalt applications. Students are expected to become familiar with the following topics:

- ✓ Ingredients of emulsion bitumen and how to produce it and it application.
- ✓ Knowing the types of asphalt in terms of production temperature.
- ✓ Cold asphalt mixing plan and their application.

REQUIRED STUDENT RESOURCES

Textbooks and References:

1. Asphalt Institute. Asphalt Cold Mix Manual (7th Edition). Asphalt Institute Press. 2020.
2. Asphalt Institute. Bitumen Emulsion (3th Edition). Asphalt Institute Press. 2015.

Web links: -

Computer Software: -

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week 16	Topic	Reading /Assignment
1	Introduction and Basic Background	-
2	Bitumen Structure and Production	-
3	Different of Bitumen	-
4	Structure of Emulsion Bitumen	-
5	Effect of Different Parameters (Bitumen, Emulsifier, Water and …) on Emulsion Bitumen Durability.	-
6	Investigation of Bitumen Emulsion problems.	-
7	Applications of emulsion bitumen in road construction projects: Surface Treatment, Slurry seal, Microsurfacing, Chip seal.	-
8	Applications of emulsion bitumen in road construction projects: Tack Coat, Prime Coat, Fog Seal.	-
9	Applications of emulsion bitumen in road construction projects: Cold Mix Asphalt	-
10	Introduction of Different Asphalt (Based on Temperature)	-
11	Mix Design of Cold Mix Asphalt	-
12	Introduction to Asphalt Plant (Cold Mix Asphalt)	-
13	Recycling of Cold Mix Asphalt	-
14	Cold In Place and Cold In Plant Asphalt	-
15	Production and Compaction of Cold Asphalt	-
16	Investigation of cold asphalt problems.	-

EVALUATION PROCEDURES AND GRADING CRITERIA

HWs (5%), Midterm (35%), Final (60%)

ATTENDANCE STATEMENT

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SYLLABI ON WEB PAGES

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PAVEMENT LABORATORY

BASIC INFORMATION

Course prefix, title and semester: Pavement Laboratory
Number of credits: 1

COURSE PREREQUISITES:

-

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Ahmad Goli/ Dr. Mohsen Aboutalebi
Office location: Faculty of Civil Engineering and Transportation, University of Isfahan, Hezar-Jerib av., Isfahan, Iran.
Phone Number: +98 (31) 37935319 / +98 (31) 37935322
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WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
1 h	-	1 h	-

COURSE OBJECTIVES

The aim in Pavement Laboratory is to understand how to perform bitumen and asphalt tests. Students are expected to become familiar with the following topics:

- ✓ Ability to perform bitumen and asphalt tests.
- ✓ Knowledge of standards for bitumen and asphalt tests (AASHTO and ASTM).
- ✓ Ability to work with bitumen and asphalt testing machines.

REQUIRED STUDENT RESOURCES

Textbooks and References:

1. Ahmad Goli. Asphalt and Bitumen Test Methods. Mashgh-e-Shab Press, 2018.
2. Mahyar Arabani. Asphalt and Bitumen Test Methods. Gilan University Press. 2018.
3. Jey Refinery (Q.C.). Bitumen Performance Grade Tests. Mashgh-e-Shab Press, 2020.

Web links: -

Computer Software: -

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week 16	Topic	Reading /Assignment
1	Introduction and Basic Background	-
2	Classic Bitumen Test: Penetration and Soft Point.	-
3	Classic Bitumen Test: Viscosity (Saybolt and Kinematic Methods)	-
4	Classic Bitumen Test: Ductility and Flash Point	-
5	PG Grade Test: Introduction	-
6	PG Grade Test: RTFO and PAV	-
7	PG Grade Test: DSR and RV	-
8	PG Grade Test: BBR and DTT	-
9	PG Grade Test: LAS and MSCR	-
10	Classic Asphalt Test: Mix Design	-
11	Classic Asphalt Test: Marshall Method	-
12	Classic Asphalt Test: Analysis of Asphalt Mixture Parameters	-
13	Superpave Asphalt Test: Mix Design	-
14	Superpave Asphalt Test: Resilient Modulus ITS	-
15	Superpave Asphalt Test: Dynamic and Static Creep	-
16	Superpave Asphalt Test: Fatigue and Rutting	-

EVALUATION PROCEDURES AND GRADING CRITERIA

HWs (5%), Laboratory Work (35%), Final (60%)

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SYLLABI ON WEB PAGES

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ROAD MAINTENANCE MANAGEMENT

BASIC INFORMATION

Course prefix, title and semester: Road maintenance management
Number of credits: 3

COURSE PREREQUISITES:

-

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Mohsen Aboutalebi
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Email Address: m.aboutalebi.e@eng.ui.ac.ir

WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
3 h	-	-	1 h

COURSE OBJECTIVES

The purpose of this is to acquaint students with the topics of maintenance management, management methods and models, as well as to review management issues at the project and network level as follows:

- ✓ An overview of issues in pavement management.
- ✓ Systematic strategy in pavement management, life cycle analysis and PMS goals.
- ✓ How to prepare and manage databases, methods of dividing the network into homogeneous parts for PMS.
- ✓ Estimating the required data list, data collection list and how to prepare them.
- ✓ Data collection methods and equipment.
- ✓ Roughness measurement methods and measuring the service level of pavement.
- ✓ Familiarity with non-destructive tests and their application in pavement assessment, fluctuation measurements and data preparation steps.
- ✓ Determining the capacity of pavement structures, pavement design based on fluctuation data.
- ✓ Identify pavement defects and how to measure them.
- ✓ Collection and preparation of pavement damages data.
- ✓ Introduction of analytical software in pavement evaluation.
- ✓ Equipment for traffic data collection and friction measurement.

- ✓ Field operations visual inspection of pavement damages.
- ✓ Implement PMS at project level.
- ✓ Methods of assessing the condition of pavement and introducing their indicators.
- ✓ Pavement demolition models and their application in pavement management.
- ✓ Failure models of rigid and flexible pavements.
- ✓ Vehicle operation cost models and traffic delay cost models.
- ✓ Decision criteria, maintenance time criteria, maintenance methods and their effects, maintenance and improvement policy, prioritization and optimization criteria.
- ✓ PMS analysis, one-year and multi-year maintenance and improvement work plan, analysis period, budget and improvement prioritization, PMS output report.

REQUIRED STUDENT RESOURCES

Textbooks and References:

1. Shahin, Mohamed Y. *Pavement management for airports, roads, and parking lots*. 1994.
2. Shahin, M. Y. Pavement Management for Airports, Roads, and Parking Lots. 2005.

Web links: -

Computer Software: Micro PAVER

COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week 16	Topic	Reading /Assignment
1	An overview of issues in pavement management. Systematic strategy in pavement management, life cycle analysis and PMS goals.	-
2	How to prepare and manage databases, methods of dividing the network into homogeneous parts for PMS. Estimating the required data list, data collection list and how to prepare them.	-
3	Data collection methods and equipment.	-
4	Roughness measurement methods and measuring the service level of pavement.	-
5	Familiarity with non-destructive tests and their application in pavement assessment, fluctuation measurements and data preparation steps.	-
6	Determining the capacity of pavement structures, pavement design based on fluctuation data.	-
7	Identify pavement defects and how to measure them.	-
8	Collection and preparation of pavement damages data.	-
9	Introduction of analytical software in pavement evaluation.	-
10	Equipment for traffic data collection and friction measurement.	-
11	Field operations visual inspection of pavement damages.	-
12	Implement PMS at project level.	-
13	Methods of assessing the condition of pavement and introducing their indicators.	-
14	Pavement demolition models and their application in pavement management. Failure models of rigid and flexible pavements.	-

15	Decision criteria, maintenance time criteria, maintenance methods and their effects, maintenance and improvement policy, prioritization and optimization criteria.	-
16	PMS analysis, one-year and multi-year maintenance and improvement work plan, analysis period, budget and improvement prioritization, PMS output report.	-

EVALUATION PROCEDURES AND GRADING CRITERIA

HWs (10%), Project (30%), Midterm (30%), Final (30%)

ATTENDANCE STATEMENT

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STUDENTS WITH DISABILITIES ACT FOR STUDENTS WITH SPECIAL NEEDS STATEMENT

The following statement must appear on all syllabi: "Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the Disability Services Office as soon as possible."

APPROVED ACADEMIC HONESTY STATEMENT

The following statement must appear on all syllabi: "The academic community is operated on the basis of honesty, integrity, and fair play. It applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records.

SYLLABI ON WEB PAGES

Syllabi presented on web pages shall contain the date of last update.

SEMINAR AND RESEARCH METHODS

BASIC INFORMATION

Course prefix, title and semester: Seminar and Research method

Number of credits: 2

COURSE PREREQUISITES:

-

COURSE CO-REQUISITES:

-

TEACHERS:

Person in charge: Dr. Ahmad Reza Jafarian-Moghaddam
Office location: Faculty of Civil Engineering and Transportation, University of Isfahan, Hezar-Jerib av., Isfahan, Iran
Phone Number: +983137935318
Email Address: ar.jafarian@trn.ui.ac.ir

WEEKLY HOURS

Theory	Problem Solving	Laboratory	Guided learning
2 h	-	-	60 min

COURSE OBJECTIVES

This course aims to familiar students with the research procedure, ethical principles and challenges, the scientific searching and indexing, the methods of presentation and scientific speech, and the principles of writing research proposals and thesis. Students will use these theoretical underpinnings to begin to critically review literature relevant to their field or interests.

REQUIRED STUDENT RESOURCES

Textbooks:

References:

1- R. R. Powell and L. S. Connaway, “Basic Research Methods for Librarians”, 5th Edition (Library and Information Science Text Series), 2010.
2- R. K. Yin, “Case Study Research, Design, and Methods”, 5th Edition, Sage Publications, 2013.
3- W. K. Schuttle and E. Schuttle, “Communications Skills for the Information Age”, 3rd Edition, McGraw-Hill Book Co., 2001.
4- www.clarivate.com

5- www.scimagojr.com
6- scholar.google.com
7- www.endnote.com

Web links: -
Computer Software: Endnote, Mendeley
COURSE SCHEDULE/OUTLINE/CALENDAR OF EVENTS

Week	Topic
1	Definitions and familiarity with types of research
2	Knowing the generalities and objectives of the proposal and thesis
3	Research process
4	The problem solving process
5	methods of determining the topic for research (research topic criteria)
6	Familiarity with journals and their scientific level
7	Learning the journals ranking system
8	Indices for evaluation of research
9	How to search for scientific articles
10	Citing and referencing methods
11	Literature Reviews Fundamentals
12	Principles of ethics in research
13	Introduction to essay writing
14	Knowing and working with Endnote software
15	Key points in preparing slides and verbal presentations
16	Seminar by students

EVALUATION PROCEDURES AND GRADING CRITERIA
Home works (30%), Project (70%), Midterm (-), Final (-)

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