



قسم الهندسة المدنية - مواد الامتحان التنافسي للعام الدراسي 2025-2026
الماجستير / ميكانيك تربة وهندسة الأسس

| الماجستير / ميكانيك تربة وهندسة الأسس | | |
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| الدرجة | المادة الدراسية | ت |
| % 15 | مقاومة المواد | .1 |
| % 15 | ميكانيك الموائع | .2 |
| % 15 | هندسة الاسس | .3 |
| % 15 | ميكانيك التربة | .4 |
| % 15 | منشآت هيدروليكية | .5 |
| % 15 | جيولوجيا هندسية | .6 |
| % 10 | تحليلات هندسية | .7 |



Competitive Exam - Post-Graduate (MSc Program) - 2025-2026

Strength of Materials- By Ferdinand L. Singer

| Chapter | Subject | Remarks |
|---------------|---|---------|
| One | Simple Stress - Normal Stress - Shearing Stress - Bearing Stress - Thin-Walled Cylinders | |
| Two | Simple Strain - Hooke's Law: Axial Deformation - Poisson's Ratio: Biaxial And Triaxial Deformations | |
| Three | Ch.3 Torsion | |
| Four | Shear And Moment Diagram of Beams | |
| Five | Stress in Beams - Flexural Stress in Beams - Shear Stress in Beams - Design For Flexure And Shear | |
| Nine | Combined Stresses - Mohr's Circle | |
| Eleven | Columns - Critical Load - Long Columns By Euler's Formula | |



| Competitive Exam - Post-Graduate (MSc Program) – 2025-2026 | | |
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| Fluid Mechanics/ F. M.White | | |
| Chapter | Subject | Remarks |
| <u>One</u> | -Introduction to Fluid Mechanics - Fluid Properties | |
| <u>Two</u> | -Hydrostatic pressure distribution -Application to Manometry -Hydrostatic Force on the plane surfaces -Hydrostatic Force on curved surfaces | |
| <u>Three</u> | -Fundamental physical law of fluid mechanics -Conservation of mass - linear moment equation - Energy Equation -Hydraulic and energy grade lines | |
| <u>Five</u> | -Dimensional analysis -The pi Theorem | |
| <u>Six</u> | -Viscous Flow -Laminar and Turbulent Flow -Pipes system | |



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Soil Mechanics

Principal of Geotechnical Engineering - Braja M. Das and Kh. Sobhan

| Chapter | Subject | Remarks |
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| <u>Two</u> | <p><u>Origin of Soil and Grain Size</u></p> <ul style="list-style-type: none"> - The Origin of Soil Rock-Forming Minerals, Rock and Rock Structures - Soil-Particle Size, Clay Minerals, Mechanical Analysis of Soil, Particle-Size Distribution Curve, Particle Shape | |
| <u>Three</u> | <p><u>Weight-Volume Relationships</u></p> <ul style="list-style-type: none"> - Weight-Volume Relationships, Relationships among Unit Weight, Void Ratio, Moisture Content, and Specific Gravity, and Porosity, Relative Density and e_{max} and e_{min} | |
| <u>Five</u> | <p><u>Classification of Soil</u></p> <ul style="list-style-type: none"> - Textural Classification, Classification by Engineering Behavior - AASHTO Classification System - Unified Soil Classification System | |
| <u>Nine</u> | <p><u>In Situ Stresses</u></p> <ul style="list-style-type: none"> - Stresses in Saturated Soil without Seepage, with Upward Seepage, with Downward Seepage, Seepage Force, Capillary Rise in Soils , Effective Stress in the Zone of Capillary Rise | |
| <u>Eleven</u> | <p><u>Compressibility of Soil</u></p> <ul style="list-style-type: none"> - Contact Pressure and Settlement Profile - Relations for Elastic Settlement Calculation - One-Dimensional Laboratory Consolidation Test - Void Ratio-Pressure Plots - Normally Consolidated and Overconsolidated Clays - Calculation of Settlement from One-Dimensional Primary Consolidation - Secondary Consolidation Settlement - Time Rate of Consolidation - Determination of Coefficient of Consolidation - Calculation of Consolidation Settlement under a Foundation | |
| <u>Twelve</u> | <p><u>Shear Strength of Soil</u></p> <ul style="list-style-type: none"> - Mohr-Coulomb Failure Criterion, Inclination of the Plane of Failure Caused by Shear - Laboratory Test for Determination of Shear Strength Parameters, Direct Shear Test, Drained Direct Shear Test on Saturated Sand and Clay, General Comments on Direct Shear Test - Triaxial Shear Test-General, Consolidated-Drained Triaxial Test, Consolidated-Undrained Triaxial Test, Unconsolidated-Undrained Triaxial Test, Unconfined Compression Test on Saturated Clay Sensitivity and Thixotropy of Clay | |
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Foundation Engineering : by Braja M. Das & Nagaratnam Sivakugan

| Chapter | Subject | Remarks |
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| Three | <u>Subsoil Exploration</u> Subsurface Exploration Program, Exploratory Borings in the Field, Procedures for Sampling Soil, Split-Spoon Sampling and Standard Penetration Test, Observation of Water Tables, Vane Shear Test, Cone Penetration Test, | |
| Six & Seven | <u>BEARING CAPACITY OF SHALLOW FOUNDATIONS</u> Methods of determining bearing capacity, Effect of soil compressibility, Footings with inclined or eccentric loads, Effect of water table on bearing capacity, Skempton's bearing capacity equation | |
| Nine | <u>SETTLEMENT OF BUILDINGS</u> Immediate settlement based on the theory of elasticity, Schmertmann's method (1978), Bjerrum's method for average settlement of layered clay soil, Primary consolidation settlement, Secondary consolidation settlement, Degree or rate of settlement | |
| Twelve | <u>Pile Foundations</u> Introduction, Pile Materials, Point Bearing and Friction Piles, Load Transfer Mechanism, Meyerhof's Method for Estimating Q_p , Vesic's Method for Estimating Q_p , Frictional Resistance (Q_s) in Sand , Frictional (Skin) Resistance in Clay, Pile Load Tests , Elastic Settlement of Piles ,Negative Skin Friction, Group Piles, Group Efficiency , Ultimate Capacity of Group Piles in Saturated Clay, Elastic Settlement of Group Piles | |
| Sixteen | <u>Lateral Earth Pressure</u> Lateral Earth Pressure at Rest, Active Pressure, Rankine Active Earth Pressure, Coulomb's Active Earth Pressure, Passive Pressure, Rankine Passive Earth Pressure, Coulomb's Passive Earth Pressure | |
| Seventeen | <u>Retaining Walls</u> Gravity and Cantilever Check for Overturning, Check for Sliding Along the Base, Check for Bearing Capacity Failure | |
| Eighteen | <u>Sheet-Pile Walls</u> Cantilever Sheet-Pile Walls, Cantilever Sheet Piling Penetrating Sandy Soils, Cantilever Sheet Piling Penetrating Clay, | |



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| Hydraulic Structures - Subhash Kumar Garg | | |
| Chapter | Subject | Remarks |
| One | Regulators - Discharge of Regulators with fully and partial opening of gate | |
| Two | Design of Floor - Bligh's Theory - Lane's Theory - Khosla's Theory | |
| Three | Transitions - Design of Warped Transition | |
| Four | Energy Dissipaters -Hydraulic Jump -Standard Stilling Basins | |
| Five | - Hydraulic Design - Culvert - Pipe and Flume Aqueduct - Siphon | |
| Six | Dams - Concrete Gravity Dam - Earth Dams | |
| Seven | Spillways -Design of Ogee Spillway | |



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| الجيولوجيا الهندسية / تأليف مجيد عبود جاسم الطائي | | |
| Chapter | Subject | Remarks |
| <u>الاول</u> | <u>مفاهيم أساسية في الهندسة الجيولوجية</u> - مهام الهندسة الجيولوجية - مهام وإعمال المهندس الجيولوجي - فروع الهندسة الجيولوجية | |
| <u>الثاني</u> | <u>علم المعادن</u> الخصائص الفيزيائية للمعادن التصنيف الكيميائي للمعادن علم البلورات - الأشكال البلورية للمعادن | |
| <u>الثالث</u> | <u>أصل المواد الصخرية وطبيعتها</u> تركيب الأرض وأغلفتها الدورة الجيوكيميائية للصخور أنواع الصخور الخواص الفيزيائية للصخور الخواص الميكانيكية للصخور التربة | |
| <u>السادس</u> | <u>جيولوجيا الأنهار</u> الترسيب في الأنهار النقل و | |
| <u>السابع</u> | <u>جيولوجيا المياه تحت السطحية</u> - المياه الجوفية - أصل ومصادر المياه تحت سطحية | |
| <u>الثامن</u> | - الترب الجبسية - أصل المواد الجبسية - التربة الجبسية في العراق | |



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| ADVANCED ENGINEERING MATHEMATICS By C. RAY WYLIE & LOUIS C. BARRETT | | |
| Chapter | Subject | Remarks |
| <u>One</u> | <u>Ordinary Differential Equations of the First Order</u> <ul style="list-style-type: none"> - Classification of Differential Equations - Solutions of Differential Equations - Separable First-Order Equations - Homogeneous First-Order Equations - Exact First-Order Equations - Linear First-Order Equations - Special First-Order Equations - Orthogonal Trajectories | |
| <u>Two</u> | <u>Linear Differential Equations</u> <ul style="list-style-type: none"> - Homogeneous Second-Order Equations with Constant Coefficients - Solutions of Nonhomogeneous Equations - Nonhomogeneous Equations with Constant Coefficients - Homogeneous Equations of Higher Order - Variation of Parameters and Reduction of Order | |
| <u>Four</u> | <u>Simultaneous Linear Differential Equations</u> <ul style="list-style-type: none"> - Solutions, Consistency, and Equivalence of Linear Differential Systems - Fundamental Concepts and Theorems Concerning First-Order Systems - Complementary Functions and Particular Integrals of Linear Differential Systems | |
| <u>Nine</u> | <u>Partial Differential Equations</u> <ul style="list-style-type: none"> - Introduction - The Derivation of Equations - Characteristics and the Classification of Partial Differential Equations - Separation of Variables | |