



2023- 2024

Civil Engineering Program Specification فصول دراسية



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Civil Engineering

B.Sc. Program Specification

| 1. Basic Information | | |
|----------------------|--|---------------------------|
| 1.1 | Program title | Civil Engineering |
| 1.2 | Program type | Single |
| 1.3 | Department (s) | Civil Engineering |
| 1.4 | Coordinator | Prof. Dr./ Mohamed Elkiki |
| 1.5 | External evaluator(s) | 8/2023 |
| 1.6 | Last date of program specifications approval | 10/2023 |
| 1.7 | Year of starting the program | 2019 |

| 2. Professional Information | | |
|-----------------------------|---|--|
| 2.1 Program Vision | | |
| | The department works to become a distinguished school that presents civil engineers with high technical competencies and encourages advanced research to meet current and future challenges in the fields of civil engineering and local, regional and international excellence. | |
| 2.2 Program Mission | | |
| | Offering advanced bachelor's programs in civil engineering to inculcate moral and ethical values of community service while developing skills to add value to the competencies of graduates. Transferring knowledge and activities to students with an emphasis on developing leadership qualities and teamwork. Providing infrastructure events and resources that contribute to a student-friendly learning environment. Providing a knowledge base and advisory services to the community in all fields of civil engineering. Encouraging students to pursue continuous learning and development to take professional competitive exams with the required training, to meet the needs of the labor market at the local, regional and international levels. | |

| 3. Graduate Attributes | |
|---|---|
| The graduates of the civil engineering program should be having the following attributes: | |
| 1 | 1 - Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations. |



| | |
|----|--|
| 2 | Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation. |
| 3 | Behave professionally and adhere to engineering ethics and standards. |
| 4 | Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance. |
| 5 | Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community. |
| 6 | Value the importance of the environment, both physical and natural, and work to promote sustainability principles. |
| 7 | Use techniques, skills and modern engineering tools necessary for engineering practice. |
| 8 | Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies. |
| 9 | Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner. |
| 10 | Demonstrate leadership qualities, business administration and entrepreneurial skills. |

| 4. Program aims | |
|---|---|
| The graduates of the Civil engineering program should be able to: | |
| 1 | Apply a broad range of engineering knowledge, science and specialized skills with analytic, systemic and critical thinking to identify and solve engineering problems in real life. |
| 2 | Lead, supervise, manage and work in a diverse team of professionals from various engineering disciplines, taking responsibility for own and team performance to achieve society's requirements of occupational safety, health, and quality standards. |
| 3 | Recognize the role in promoting engineering and contributing to the profession's and community's development and appreciating the importance of the environment. |



| | |
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| 4 | Use the techniques, skills, and current engineering tools required for engineering practice by taking full responsibility for one's own learning and development of the ability to pursue postgraduate. |
| 5 | Communicate effectively with a variety of audiences using a variety of forms, methods, and languages. |
| 6 | Analyze data from the intended tests to manage resources creatively. |
| 7 | Achieve an optimum professionally in design and supervision of civil engineering projects and use the codes of practice of all civil engineering branches. |
| 8 | Apply analytical, experimental, design, construction engineering processes with proficiency aided by modern engineering tools. |
| 9 | Work to develop the profession and the community and promote sustainability principles and behave professionally and adhere to engineering ethics and standards. |
| 10 | Select the appropriate construction and building materials professionally and effectively and sustainable technologies for construction of buildings. |

| 5. | Competency | LOS |
|---|---|--|
| Achievement of the following Program Outcomes would indicate that the graduates are equipped with the necessary knowledge and skills to achieve the Educational Objectives. | | |
| C1 | Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics. | a1 Describe the relevant mathematical principles and theories in the discipline. a2 Explain the scientific principles and theories that apply to the topic. a3 Explain the basic principles of engineering. b1 Using math ideas and theories that are applicable to the field. b2 Using scientific concepts and theories that are relevant to the profession. b3 Applying engineering basics that are relevant to the subject. c1 Identify, formulate, and solve complex engineering problems by -applying the concepts and the theories of mathematics. c2 Identify, formulate, and solve complex engineering problems by applying the concepts and the theories of sciences, appropriate to the discipline. |



| | | |
|-----------|--|--|
| | | <p>c3 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals.</p> |
| C2 | Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess, and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions. | <p>a1 Define, basic characteristics, properties, concepts, and techniques of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology and fluid mechanics.</p> <p>a2 Define the principles, basic properties, and features of construction material, as well as their use in sustainable technologies for construction of buildings, infrastructures, and water structures.</p> <p>b1 Conduct basic experiments to learn about the basic characteristics and features of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics.</p> <p>b2 Conduct basic experiments to learn about the applications of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics in the fields of transportation and traffic, roadways and airports, railways, sanitary works, irrigation, water resources and harbors, or any other emerging field relevant to the discipline.</p> <p>b3 Analyze and interpret data.</p> <p>b4 Evaluate components, systems, and processes are evaluated for their characteristics and performance.</p> <p>c1 Choose relevant mathematical and computer-based methodologies for problem modelling and analysis.</p> <p>c2 Develop suitable experimentation and/or simulation.</p> <p>c3 Applying statistical analyses and objective engineering judgment to draw conclusions.</p> |
| C3 | Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, | <p>a1 Learn the general principles of design techniques specific to reinforced concrete and steel structures, foundations and earth retaining structures.</p> |



| | | |
|-----------|---|---|
| | ethical, and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development. | <p>a2 Understand the professional ethics and impacts of engineering solutions on society and environment.</p> <p>a3 Recognizes the various construction defects, instability and quality issues and assess environmental impacts of projects.</p> <p>b1 Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.</p> <p>c1 Incorporate economic, societal, global, environmental, and risk management factors into design.</p> <p>c2 Applying engineering design procedures to generate cost-effective solutions while adhering to the principles and contexts of sustainable design and development.</p> |
| C4 | Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues, and risk management principles. | <p>a1 Describe quality assurance systems, codes of practice, and standards, as well as health and safety regulations and environmental concerns.</p> <p>a2 List the engineering-related business and management principles.</p> <p>a3 Define contemporary engineering technologies and their applications in relation to disciplines.</p> <p>b1 Create methodical approaches when dealing with new and advancing technology.</p> <p>c1 Apply safe systems at work by taking the necessary precautions to manage hazards.</p> <p>c2 Use fundamental organizational and project management abilities.</p> <p>c3 Utilize modern technologies.</p> <p>c4 Apply quality assurance procedures and follow codes and standards.</p> |
| C5 | Practice research techniques and methods of investigation as an inherent part of learning. | <p>a1 Define technical language and report writing.</p> <p>b1 Assess different ideas, views, and knowledge from a range of sources.</p> <p>c1 Prepare technical reports.</p> <p>d1 Search for information to engage in lifelong self-learning discipline.</p> |
| C6 | Plan, supervise and monitor implementation of engineering | <p>a1 Show the appropriate and sustainable technologies for construction of buildings,</p> |



| | | |
|------------|--|---|
| | projects, taking into consideration other trades requirements. | infrastructures and water structures. b1 interpret data derived from laboratory observation from equipment flow sheets, charts, and curves to interpret data derived from laboratory observation. c1 Conduct experimental work related to the reinforced concrete and steel structures, foundations and earth retaining structures. c2 Acquire entrepreneurial skills. |
| C7 | Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams. | d1 Collaborate effectively within multidisciplinary team. d2 Work in stressful environment and within constraints. d3 Motivate individuals. |
| C8 | Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools. | d1 Communicate effectively. d2 Demonstrate efficient IT capabilities. |
| C9 | Use creative, innovative, and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations. | d1 Think creatively in solving problems of design. d2 Effectively manage tasks, time, and resources. d3 Refer to relevant literature. |
| C10 | Acquire and apply new knowledge, and practice self, lifelong and other learning strategies. | d1 Search for information to engage in lifelong self-learning discipline. d2 Professionally merge engineering knowledge, understanding, and feedback to improve design, products and/or services. |
| C11 | Select appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures; using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of structural analysis and mechanics, properties and strength of materials, surveying, | a1. Recognize the fundamentals of structural analysis and mechanics, properties and strength of materials, surveying, soil mechanics, hydrology, and fluid mechanics. a2. Summarize appropriate and sustainable technologies for construction of buildings, infrastructures, and water structures. c1 Using either numerical techniques or physical measurements and/or testing by applying a full range of civil engineering concepts and techniques of structural analysis and mechanics, properties and strength of |



| | | |
|-----|--|--|
| | soil mechanics, hydrology and fluid mechanics. | materials, surveying, soil mechanics, hydrology, and fluid mechanics. |
| C12 | Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline. | b1 Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures. b2 Achieve an optimum design of works for transportation and traffic, roadways and airports, railways, sanitary works, irrigation, water resources and harbors; or any other emerging field relevant to the discipline. |
| C13 | Plan and manage construction processes; address construction defects, instability, and quality issues; maintain safety measures in construction and materials; and assess environmental impacts of projects. | a1 defines plan and mange construction process. b1 Address construction defects, instability, and quality issues c1 Assess environmental impacts of projects. |
| C14 | Deal with biddings, contracts and financial issues including project insurance and guarantees. | a1 define biddings, contracts, and financial issues. b1 Address biddings, contracts and financial issues including project insurance and guarantees. c1 Apply biddings, contracts, and financial issues on civil engineering projects |

6. Academic standards

The program adopts the National Academic reference standards of Civil engineering program (NARS 2018) which is approved by the national authority for quality assurance and accreditation of education NAQAAE.

7. Reference standards

- a. External references for standards (Benchmarks)
 - ABET Engineering Criteria 2000
 - University of Texas at Austin, College of Engineering, Dept. of CIVIL Engineering
 - Iowa State University, CIVIL Engineering Dept.
 - Kuwait University, College of Engineering and Petroleum, Civil Engineering Department.



8. Program Curriculum Structure and Contents

8.1 Program duration:

The program duration is five years

8.2 Program structure:

- Total hours of the program:** 264 contact hours
- Theoretical:** 139 contact hours
- Practical/Exercises:** 125 contact hours
- Compulsory:** 248 contact hours
- Elective:** 16 contact hours

| Level | No. Hours / Week | | | | | | Average hours/week | | | Total/ Week | |
|-----------------|-----------------------|--------|------|------------------------|--------|------|--------------------|--------|------|----------------|--|
| | First Term (15 Weeks) | | | Second Term (15 Weeks) | | | | | | | |
| | Lecture | Exerc. | Lab. | Lecture | Exerc. | Lab. | Lecture | Exerc. | Lab. | | |
| 0 | 11 | 8 | 8 | 15 | 6 | 6 | 13 | 7 | 7 | 27 | |
| 1 st | 15 | 10 | 2 | 13 | 7 | 5 | 14 | 8.5 | 3.5 | 26 | |
| 2 nd | 14 | 8 | 5 | 14 | 11 | 1 | 14 | 9.5 | 3 | 26.5 | |
| 3 rd | 16 | 10 | 2 | 14 | 10 | 2 | 15 | 10 | 2 | 27 | |
| 4 th | 13 | 10 | 2 | 14 | 12 | - | 13.5 | 11 | 1 | 25.5 | |
| Total | 69 | 46 | 19 | 70 | 46 | 14 | 69.5 | 46 | 16.5 | 132 | |

| Level | Humanities and Social sciences | | Business Administration | | Mathematics and Basic Sciences | | Engineering Culture | | Basic Engineering Sciences | | Applied Engineering and Design | | Projects and Practice | | Total |
|-----------------|--------------------------------|----------------------|-------------------------|----------------------|--------------------------------|----------------------|----------------------|----------------------|----------------------------|----------------------|--------------------------------|----------------------|-----------------------|----------------------|-------|
| | 1 st term | 2 nd term | 1 st term | 2 nd term | 1 st term | 2 nd term | 1 st term | 2 nd term | 1 st term | 2 nd term | 1 st term | 2 nd term | 1 st term | 2 nd term | |
| 0 | 0 | 8 | 0 | 0 | 22 | 14 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 54 |
| 1 st | 4 | 4 | 0 | 0 | 4 | 4 | 5 | 4 | 15 | 12 | 0 | 0 | 0 | 0 | 52 |
| 2 nd | 0 | 0 | 3 | 0 | 8 | 4 | 0 | 0 | 16 | 18 | 0 | 4 | 0 | 0 | 53 |
| 3 rd | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 8 | 0 | 20 | 22 | 0 | 0 | 54 |
| 4 th | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 12 | 5 | 6 | 51 |
| Total | 24 | | 7 | | 56 | | 14 | | 74 | | 78 | | 11 | | 264 |
| % | 9.09 | | 2.65 | | 21.21 | | 5.30 | | 28.03 | | 29.54 | | 4.17 | | 100 |



9. THE REFERENCE FRAMES DETERMINANTS FOR BACHELOR STAGE

A. Humanities and Social Sciences

| Code | Course Name | Contact hour |
|--------|-------------------------------------|--------------|
| BAS025 | Int. to Engineering and Environment | 2 |
| BAS026 | Technical English Language 1 | 4 |
| BAS027 | Human Rights | 2 |
| BAS114 | Technical English Language 2 | 4 |
| BAS122 | Technical Report Writing | 4 |
| BAS421 | Research and Analytic Skills | 2 |
| BAS422 | Environmental Management | 3 |
| CIE421 | Legislation and contracts | 3 |
| Total | | 24 |

B. Business Administration

| Code | Course Name | Contact hour |
|--------|--------------------------------|--------------|
| BAS213 | Engineering Economy | 3 |
| BAS321 | Project Management and Control | 4 |
| Total | | 7 |

C. Mathematics and Basic Sciences

| Code | Course Name | Contact hour |
|--------|--|--------------|
| BAS011 | Mathematics 1 | 4 |
| BAS012 | Mechanics 1 | 4 |
| BAS013 | Physics 1 | 6 |
| BAS014 | Engineering Chemistry | 4 |
| BAS016 | Int. to Computer Systems | 4 |
| BAS021 | Mathematics 2 | 4 |
| BAS022 | Mechanics 2 | 4 |
| BAS023 | Physics 2 | 6 |
| BAS111 | Mathematics 3 | 4 |
| BAS121 | Mathematics 4 | 4 |
| BAS211 | Engineering Probability and Statistics | 4 |
| BAS214 | Computer Programming | 4 |
| BAS221 | Numerical Methods in Engineering | 4 |
| Total | | 56 |



D. Engineering Culture

| Code | Course Name | Contact hour |
|--------|-------------------------------------|--------------|
| BAS024 | Production Engineering | 5 |
| BAS112 | Electrical Engineering Fundamentals | 5 |
| BAS123 | Int. to Information Technology | 4 |
| | Total | 14 |

E. Basic Engineering Sciences

| Code | Course Name | Contact hour |
|--------|---|--------------|
| BAS015 | Engineering Drawing and Projection | 5 |
| BAS113 | Engineering Thermodynamics | 5 |
| BAS124 | Strengthen of Materials | 4 |
| BAS212 | Fluid Mechanics | 4 |
| CIE111 | Structures Analysis 1 | 5 |
| CIE112 | Civil Engineering Drawing 1 | 4 |
| CIE121 | Structures Analysis 2 | 5 |
| CIE122 | Civil Engineering Drawing 2 | 4 |
| CIE211 | Structure Analysis 3 | 4 |
| CIE212 | Properties and Strength of concrete Materials | 4 |
| CIE213 | Surveying 1 | 4 |
| CIE221 | Hydrology and Irrigation Engineering | 4 |
| CIE222 | Reinforced Concrete 1 | 6 |
| CIE224 | Traffic and Transportation Engineering | 4 |
| CIE225 | Principles of Building Construction | 4 |
| CIE312 | Geology and Soil Mechanics 1 | 4 |
| CIE313 | Open Channels Hydraulics | 4 |
| | Total | 74 |

F. Applied Engineering and Design

| Code | Course Name | Contact hour |
|--------|---------------------------|--------------|
| CIE223 | Surveying 2 | 4 |
| CIE311 | Reinforced Concrete 2 | 6 |
| CIE314 | Steel Structures Design 1 | 6 |



| | | |
|--------|---|----|
| CIE315 | Highways and Airport Engineering | 4 |
| CIE316 | Water Supply Engineering | 4 |
| CIE321 | Reinforced Concrete 3 | 5 |
| CIE322 | Soil Mechanics and Foundation | 4 |
| CIE323 | Computer Application in Civil Engineering | 4 |
| CIE324 | Steel Structures Design 2 | 5 |
| CIE326 | Water and wastewater treatment | 4 |
| CIE411 | Foundation Engineering 1 | 4 |
| CIE412 | Inland Navigation and Harbor Engineering | 4 |
| CIE413 | Design of Irrigation Works | 4 |
| CIE415 | Elective 1 | 4 |
| CIE416 | Elective 2 | 4 |
| CIE422 | Reinforced Concrete 4 | 4 |
| CIE424 | Elective 3 | 4 |
| CIE425 | Elective 4 | 4 |
| Total | | 78 |

G. Projects and Practice

| Code | Course Name | Contact hour |
|--------|-------------|--------------|
| CIE226 | Training 1 | - |
| CIE325 | Training 2 | - |
| CIE414 | Project 1 | 5 |
| CIE423 | Project 2 | 6 |
| Total | | 11 |

From the previous tables, the reference frames determinations can be summarized as follows:

| No. | Department | Contact Hours | The program percentage% | Reference Frames' percentage % |
|-----|--------------------------------|---------------|-------------------------|--------------------------------|
| A | Humanities and Social sciences | 24 | 9.09 | 8-12 |
| B | Business Administration | 7 | 2.65 | 2-4 |
| C | Mathematics and Basic Sciences | 56 | 21.21 | 18-22 |
| D | Engineering Culture | 14 | 5.30 | 4-6 |
| E | Basic Engineering Sciences | 74 | 28.03 | 25-30 |
| F | Applied Engineering and Design | 78 | 29.54 | 25-30 |
| G | Projects and Practice | 11 | 4.17 | 4-6 |



| | | | |
|-------|-----|--|--|
| Total | 264 | | |
|-------|-----|--|--|

10. Contact Hours According to the Requirements

A. University Requirements

| Code | Course Name | Contact hour |
|--------|-------------------------------------|--------------|
| BAS016 | Int. to Computer Systems | 4 |
| BAS025 | Int. to Engineering and Environment | 2 |
| BAS026 | Technical English Language 1 | 4 |
| BAS027 | Human Rights | 2 |
| BAS114 | Technical English Language 2 | 4 |
| BAS421 | Research and Analytical Skills | 2 |
| CIE421 | Legislation and contracts | 3 |
| Total | | 21 |

B. Institute Requirements

| Code | Course Name | Contact hour |
|--------|--|--------------|
| BAS011 | Mathematics 1 | 4 |
| BAS012 | Mechanics 1 | 4 |
| BAS013 | Physics 1 | 6 |
| BAS014 | Engineering Chemistry | 4 |
| BAS015 | Engineering Drawing and Projection | 5 |
| BAS021 | Mathematics 2 | 4 |
| BAS022 | Mechanics 2 | 4 |
| BAS023 | Physics 2 | 6 |
| BAS024 | Production Engineering | 5 |
| BAS111 | Mathematics 3 | 4 |
| BAS112 | Electrical Engineering Fundamentals | 5 |
| BAS113 | Engineering Thermodynamics | 5 |
| BAS121 | Mathematics 4 | 4 |
| BAS122 | Technical Report Writing | 4 |
| BAS123 | Int.to Information Technology | 4 |
| BAS211 | Engineering Probability and Statistics | 4 |
| BAS221 | Numerical Methods in Engineering | 4 |
| Total | | 76 |



C. General Department Requirements

| Code | Course Name | Contact hour |
|--------|---|--------------|
| BAS124 | Strength of Materials | 4 |
| BAS212 | Fluid Mechanics | 4 |
| BAS213 | Engineering Economy | 3 |
| BAS214 | Computer Programming | 4 |
| BAS321 | Project Management and Control | 4 |
| BAS422 | Environmental Management | 3 |
| CIE111 | Structures Analysis 1 | 5 |
| CIE112 | Civil Engineering Drawing 1 | 4 |
| CIE121 | Structures Analysis 2 | 5 |
| CIE122 | Civil Engineering Drawing 2 | 4 |
| CIE211 | Structure Analysis 3 | 4 |
| CIE212 | Properties and strength of concrete Materials | 4 |
| CIE213 | Surveying 1 | 4 |
| CIE221 | Hydrology and Irrigation Engineering | 4 |
| CIE222 | Reinforced Concrete 1 | 6 |
| CIE223 | Surveying 2 | 4 |
| CIE224 | Traffic and Transportation Engineering | 4 |
| CIE225 | Principles of Building Construction | 4 |
| CIE312 | Geology and Soil Mechanics 1 | 4 |
| CIE313 | Open Channel Hydraulics | 4 |
| CIE322 | Soil Mechanics and Foundation | 4 |
| CIE323 | Computer Application in Civil Engineering | 4 |
| Total | | 90 |

D. Specific Department Requirement

| Code | Course Name | Contact hour |
|--------|-----------------------------------|--------------|
| CIE226 | Training 1 | - |
| CIE311 | Reinforced Concrete 2 | 6 |
| CIE314 | Steel Structure Design 1 | 6 |
| CIE315 | High ways and Airport Engineering | 4 |
| CIE316 | Water Supply Engineering | 4 |
| CIE321 | Reinforced Concrete 3 | 5 |
| CIE324 | Steel Structure Design 2 | 5 |
| CIE325 | Training 2 | - |



وزارة التعليم العالي
المعهد العالي للهندسة والتكنولوجيا
بدمياط الجديدة



| | | |
|--------|--|----|
| CIE326 | Water and wastewater treatment | 4 |
| CIE411 | Foundation Engineering 1 | 4 |
| CIE412 | Inland Navigation and Harbor Engineering | 4 |
| CIE413 | Design of Irrigation Works | 4 |
| CIE414 | Project 1 | 5 |
| CIE415 | Elective 1 | 4 |
| CIE416 | Elective 2 | 4 |
| CIE422 | Reinforced Concrete 4 | 4 |
| CIE423 | Project 2* | 6 |
| CIE424 | Elective 3 | 4 |
| CIE425 | Elective 4 | 4 |
| Total | | 77 |

From the previous tables, the contact hours can be summarized as follow:

| No. | Department | Contact Hours | The program percentage% | Reference Frames' percentage % |
|-------|----------------------------------|---------------|-------------------------|--------------------------------|
| 1 | University Requirements | 21 | 7.95 | 6-10 |
| 2 | Institute Requirements | 76 | 28.79 | 22-30 |
| 3 | General Department Requirements | 90 | 34.09 | 30-35 |
| 4 | Specific Department Requirements | 77 | 29.17 | 20-30 |
| Total | | 264 | (250-280) | |



11. Curriculum Structure distribution

Level 0, Semester 1

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|------------------------------------|----------------|----------|----------|-----------|-----------|-----------|---------------|-----------------|------------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student's | Total | Periodic Exam | Practical\ Oral | Final Exam | Total |
| BAS011 | Mathematics 1 | 2 | - | 2 | 4 | 4 | 8 | 60 | - | 90 | 150 |
| BAS012 | Mechanics 1 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| BAS013 | Physics 1 | 2 | 2 | 2 | 6 | 4 | 10 | 60 | 15 | 75 | 150 |
| BAS014 | Engineering Chemistry | 2 | 2 | - | 4 | 4 | 8 | 50 | 15 | 60 | 125 |
| BAS015 | Engineering Drawing and Projection | 1 | 2 | 2 | 5 | 4 | 9 | 50 | - | 75 | 125 |
| BAS016 | Int. to Computer Systems | 2 | 2 | - | 4 | 3 | 7 | 40 | 10 | 50 | 100 |
| Total | | 11 | 8 | 8 | 27 | 23 | 50 | | | | 750 |

Level 0, Semester 2

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|-------------------------------------|----------------|----------|----------|-----------|-----------|-----------|---------------|-----------------|------------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student's | Total | Periodic Exam | Practical\ Oral | Final Exam | Total |
| BAS021 | Mathematics 2 | 2 | - | 2 | 4 | 4 | 8 | 60 | - | 90 | 150 |
| BAS022 | Mechanics 2 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| BAS023 | Physics 2 | 2 | 2 | 2 | 6 | 4 | 10 | 60 | 15 | 75 | 125 |
| BAS024 | Production Engineering | 3 | 2 | - | 5 | 4 | 9 | 50 | 15 | 60 | 125 |
| BAS025 | Int. to Engineering and Environment | 2 | - | - | 2 | 2 | 4 | 25 | - | 50 | 75 |
| BAS026 | Technical English Language 1 | 2 | 2 | - | 4 | 3 | 7 | 40 | 10 | 50 | 100 |
| BAS027 | Human Rights | 2 | - | - | 2 | 2 | 4 | 20 | - | 30 | 50 |
| Total | | 15 | 6 | 6 | 27 | 23 | 50 | | | | 750 |



Level 1, Semester 1

| Code | Course Name | Hours per week | | | | | | | Degrees | | | |
|--------------|-------------------------------------|----------------|----------|-----------|-----------|-----------|-----------|---------------|-----------------|------------|------------|--|
| | | Lecture | Lab. | Exercise | Contact | Student's | Total | Periodic Exam | Practical\ Oral | Final Exam | Total | |
| BAS111 | Mathematics 3 | 2 | - | 2 | 4 | 4 | 8 | 60 | - | 90 | 150 | |
| BAS112 | Electrical Engineering Fundamentals | 3 | - | 2 | 5 | 4 | 9 | 60 | - | 90 | 150 | |
| BAS113 | Engineering Thermodynamics | 3 | - | 2 | 5 | 4 | 9 | 50 | 15 | 60 | 125 | |
| BAS114 | Technical English Language 2 | 2 | 2 | - | 4 | 3 | 7 | 40 | 10 | 50 | 100 | |
| CIE111 | Structures Analysis 1 | 3 | - | 2 | 5 | 4 | 9 | 50 | - | 75 | 125 | |
| CIE112 | Civil Engineering Drawing 1 | 2 | - | 2 | 4 | 3 | 7 | 40 | - | 60 | 100 | |
| Total | | 15 | 2 | 10 | 27 | 22 | 49 | | | | 750 | |

Level 1, Semester 2

| Code | Course Name | Hours per week | | | | | | | Degrees | | | |
|--------------|-------------------------------|----------------|----------|----------|-----------|----------------|-----------|---------------|----------------|------------|------------|--|
| | | Lecture | Lab. | Exercise | Contact | Student's load | Total | Periodic Exam | Practical\Oral | Final Exam | Total | |
| BAS121 | Mathematics 4 | 2 | - | 2 | 4 | 4 | 8 | 60 | - | 90 | 150 | |
| BAS122 | Technical Report Writing | 2 | 2 | - | 4 | 4 | 8 | 40 | 10 | 50 | 100 | |
| BAS123 | Int.to Information Technology | 2 | 2 | - | 4 | 4 | 8 | 40 | 10 | 50 | 100 | |
| BAS124 | Strength of Materials | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 | |
| CIE121 | Structures Analysis 2 | 3 | - | 2 | 5 | 5 | 10 | 60 | - | 90 | 150 | |
| CIE122 | Civil Engineering Drawing 2 | 2 | 1 | 1 | 4 | 3 | 7 | 60 | - | 75 | 150 | |
| Total | | 13 | 5 | 7 | 25 | 24 | 49 | | | | 750 | |



Level 2, Semester 1

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|---|----------------|----------|----------|-----------|-----------|-----------|---------------|----------------|-------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student' | Total | Periodic Exam | Practical Exam | Final | Total |
| BAS211 | Engineering Probability and Statistics | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| BAS212 | Fluid Mechanics | 2 | 1 | 1 | 4 | 4 | 8 | 60 | 15 | 75 | 150 |
| BAS213 | Engineering Economy | 2 | - | 1 | 3 | 4 | 8 | 40 | - | 60 | 100 |
| BAS214 | Computer Programming | 2 | 2 | - | 4 | 4 | 7 | 40 | 10 | 50 | 100 |
| CIE211 | Structures Analysis 3 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE212 | Properties and Strength of concrete Materials | 2 | 1 | 1 | 4 | 4 | 8 | 40 | 10 | 50 | 100 |
| CIE213 | Surveying 1 | 2 | 1 | 1 | 4 | 4 | 8 | 40 | 10 | 50 | 100 |
| Total | | 14 | 5 | 8 | 27 | 28 | 55 | | | | 750 |

Level 2, Semester 2

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|--|----------------|----------|-----------|-----------|-----------|-----------|---------------|----------------|-------|-------|
| | | Lecture | Lab. | Exercise | Contact | Student's | Total | Periodic Exam | Practical Exam | Final | Total |
| BAS221 | Numerical Methods in Engineering | 2 | - | 2 | 4 | 5 | 9 | 40 | - | 60 | 100 |
| CIE221 | Hydrology and Irrigation Engineering | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE222 | Reinforced Concrete 1 | 4 | - | 2 | 6 | 5 | 11 | 60 | - | 90 | 150 |
| CIE223 | Surveying 2 | 2 | 1 | 1 | 4 | 4 | 8 | 50 | 15 | 60 | 125 |
| CIE224 | Traffic and Transportation Engineering | 2 | - | 2 | 4 | 4 | 8 | 50 | - | 75 | 125 |
| CIE225 | Principles of Building Constructions | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE226 | Training 1* | - | - | - | - | - | - | 30 | - | 20 | 50 |
| Total | | 14 | 1 | 11 | 26 | 26 | 52 | | | | |

* The student should make training in the summer following the 2nd semester for 4 weeks.



Level 3, Semester 1

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|-----------------------------------|----------------|----------|-----------|-----------|-----------|-----------|---------------|----------------|------------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student's | Total | Periodic Exam | Practical Oral | Final Exam | |
| CIE311 | Reinforced Concrete 2 | 4 | - | 2 | 6 | 4 | 10 | 60 | - | 90 | 150 |
| CIE312 | Geology and Soil Mechanics1 | 2 | 1 | 1 | 4 | 4 | 8 | 40 | 10 | 75 | 125 |
| CIE313 | Open Channel Hydraulics | 2 | 1 | 1 | 4 | 4 | 8 | 30 | 10 | 60 | 100 |
| CIE314 | Steel Structure Design1 | 4 | - | 2 | 6 | 4 | 10 | 60 | - | 90 | 150 |
| CIE315 | High ways and Airport Engineering | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE316 | Water supply Engineering | 2 | - | 2 | 4 | 4 | 8 | 50 | - | 75 | 125 |
| Total | | 16 | 2 | 10 | 28 | 24 | 52 | | | | 750 |

Level 3, Semester 2

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|--|----------------|----------|-----------|-----------|-----------|-----------|---------------|----------------|------------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student' | Total | Periodic Exam | Practical Oral | Final Exam | |
| BAS321 | Project Management and Control | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE321 | Reinforced Concrete 3 | 3 | - | 2 | 5 | 4 | 9 | 50 | - | 75 | 125 |
| CIE322 | Soil Mechanics and Foundation | 2 | - | 2 | 4 | 4 | 8 | 50 | - | 75 | 125 |
| CIE323 | Computer Applications in Civil Engineering | 2 | 2 | - | 4 | 4 | 8 | 40 | 10 | 50 | 100 |
| CIE324 | Steel Structure Design 2 | 3 | - | 2 | 5 | 4 | 9 | 50 | - | 75 | 125 |
| CIE325 | Training 2* | - | - | - | - | - | - | 30 | - | 20 | 50 |
| CIE3216 | Water and wastewater treatment | 2 | - | 2 | 4 | 3 | 7 | 50 | - | 75 | 125 |
| Total | | 14 | 2 | 10 | 26 | 23 | 49 | | | | 750 |

* The student should make training in the summer following the 2nd semester for 4 weeks.



Level 4, Semester 1

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|--|----------------|----------|-----------|-----------|----------------|-----------|---------------|----------------|------------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student's Load | Total | Periodic Exam | Practical\Oral | Final Exam | Total |
| CIE411 | Foundation Engineering 1 | 2 | - | 2 | 4 | 5 | 9 | 60 | - | 90 | 150 |
| CIE412 | Inland Navigation and Harbor Engineering | 2 | - | 2 | 4 | 4 | 8 | 50 | - | 75 | 125 |
| CIE413 | Design of Irrigation Works | 2 | - | 2 | 4 | 4 | 8 | 50 | - | 75 | 125 |
| CIE414 | Project 1* | 3 | 2 | - | 5 | 4 | 9 | 60 | - | 90 | 150 |
| CIE415 | Elective 1 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE416 | Elective 2 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| Total | | 13 | 2 | 10 | 25 | 25 | 50 | | | | 750 |

Level 4, Semester 2

| Code | Course Name | Hours per week | | | | | | Degrees | | | |
|--------------|--------------------------------|----------------|------|-----------|-----------|----------------|-----------|---------------|----------------|------------|------------|
| | | Lecture | Lab. | Exercise | Contact | Student's Load | Total | Periodic Exam | Practical\Oral | Final Exam | Total |
| BAS421 | Research and Analytical Skills | 2 | - | - | 2 | 2 | 4 | 10 | - | 40 | 50 |
| BAS422 | Environmental Management | 2 | - | 1 | 3 | 3 | 6 | 40 | - | 60 | 100 |
| CIE421 | Legislation and contracts | 2 | - | 1 | 3 | 4 | 7 | 40 | - | 60 | 100 |
| CIE422 | Reinforced concrete 4 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE423 | Project 2* | 2 | - | 4 | 6 | 5 | 11 | 60 | - | 90 | 150 |
| CIE424 | Elective 3 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| CIE425 | Elective 4 | 2 | - | 2 | 4 | 4 | 8 | 40 | - | 60 | 100 |
| Total | | 14 | | 12 | 26 | 26 | 52 | | | | 750 |

Continuous course; one oral examination for both CIE414 and CIE423 at the end of the second term.



12. Curriculum Structure and Contents

12.1. Compulsory Courses

| A. Compulsory | | | | | | | | |
|----------------------|------------|--------|-------------------------------------|----------------|----------|----------|--------------|----------------|
| Level | Semester | Code | Course Name | Hours per week | | | Competencies | Program LO'S |
| | | | | Lec. | Lab. | Exer. | | |
| LEVEL 0 | SEMESTER 1 | BAS011 | Mathematics 1 | 2 | - | 2 | C1 | a1, b1, a3 |
| | | BAS012 | Mechanics 1 | 2 | - | 2 | C1 | a1, a2, b1 |
| | | BAS013 | Physics 1 | 2 | 2 | 2 | C1 | a1, a2, b1 |
| | | BAS014 | General Chemistry | 2 | 2 | - | C1 | a1, c2, c3 |
| | | | | | | | C10 | d2 |
| | | BAS015 | Engineering drawing and projection | 1 | - | 2 | C1 | a1, a2, b1, b2 |
| | | BAS016 | Int. to computer systems | 2 | 2 | - | C1 | c2, c3 |
| | | | | | | | C5 | b1 |
| Total | | | | 11 | 8 | 8 | | |
| LEVEL 0 | SEMESTER 2 | BAS021 | Mathematics 2 | 2 | - | 2 | C1 | a1, a3, b1, b3 |
| | | BAS022 | Mechanics 2 | 2 | - | 2 | C1 | a1, a2, b1, c1 |
| | | BAS023 | Physics 2 | 2 | 2 | 2 | C1 | a1, a2, a3, b2 |
| | | BAS024 | Production engineering | 3 | 2 | - | C1 | a1, a3, b3 |
| | | | | | | | C3 | c1, c2 |
| | | | | | | | C6 | a1, c2 |
| | | BAS025 | Int. to Engineering and environment | 2 | - | - | C1 | a2, a3, b2, c3 |
| | | | | | | | C3 | a2, a3, b1, c1 |
| | | BAS026 | Technical English Language 1 | 1 | - | 2 | C8 | d1 |
| | | BAS027 | Human Rights | 2 | - | - | | |
| Total | | | | 15 | 6 | 6 | | |



| A. Compulsory | | | | | | | | |
|---------------|------------|--------|------------------------------------|----------------|------|-------|--------------|----------------------------|
| Level | Semester | Code | Course Name | Hours per week | | | Competencies | Program LO'S |
| | | | | Lec. | Lab. | Exer. | | |
| LEVEL 1 | SEMESTER 1 | BAS111 | Mathematics 3 | 2 | - | 2 | C1 | a1, a2, a3, b1 |
| | | BAS112 | Electrical Engineering Fundamental | 3 | - | 2 | C1 | a1, a2, b1, b2, c1, c2 |
| | | | | | | | C2 | a1, b3, b4, c1 |
| | | BAS113 | Engineering Thermodynamics | 3 | - | 2 | C1 | a1, a2, a3, b1, b2, c1, c2 |
| | | BAS114 | Technical English Language 2 | 2 | 2 | - | C8 | d1, d2 |
| | | | | | | | C10 | d1, d2 |
| | | CIE111 | Structure Analysis 1 | 3 | - | 2 | C1 | a3, b3, c3 |
| | | | | | | | C2 | a1, c3 |
| | | | | | | | C11 | a1, c1 |
| | SEMESTER 2 | CIE112 | Civil engineering drawing 1 | 2 | - | 2 | C1 | a1, a2 |
| | | | | | | | C3 | c1 |
| | | | | | | | C13 | b1 |
| Total | | | | 15 | 2 | 10 | | |
| LEVEL 2 | SEMESTER 1 | BAS121 | Mathematics 4 | 2 | - | 2 | C1 | a1, a2, a3, b1,c1 |
| | | BAS122 | Technical Report Writing | 2 | 2 | - | C5 | a1, a2, b1, b2,c1,d1 |
| | | | | | | | C8 | d1,d2 |
| | | BAS123 | Int. to Information Technology | 2 | 2 | - | C4 | a2,a3,c3 |
| | | | | | | | C8 | d1,d2 |
| | SEMESTER 2 | BAS124 | Strengthen of materials | 2 | - | 2 | C1 | a1, b1, c2, c3 |
| | | CIE121 | Structure analysis2 | 3 | - | 2 | C1 | a1,b3 |
| | | | | | | | C2 | a1 |
| | | | | | | | C11 | a1 |
| | | CIE122 | Civil engineering drawing 2 | 2 | 1 | 1 | C1 | a2,a3 |
| | | | | | | | C3 | C1 |
| | | | | | | | C11 | C1 |
| | | | | | | | C12 | b1 |
| Total | | | | 13 | 5 | 7 | | |



| A. Compulsory | | | | | | | | |
|---------------|------------|---------|---|----------------|------|-------|--------------|------------------------|
| Level | Semester | Code | Course Name | Hours per week | | | Competencies | Program LO'S |
| | | | | Lec. | Lab. | Exer. | | |
| LEVEL 2 | SEMESTER 1 | BAS211 | Engineering Probability and Statistics | 2 | - | 2 | C1 | a1, a2, b1, b3, c2 |
| | | BAS212 | Fluid Mechanics | 2 | 1 | 1 | C2 | a1,a2,b1,b2,b3 |
| | | BAS213 | Engineering Economy | 2 | - | 1 | C2 | a1,a2,b1 |
| | | | | | | | C11 | a1, c1 |
| | | BAS214 | computer programming | 2 | 2 | - | C3 | a1,a2,b1,c1 |
| | | | | | | | C4 | a2,b1,c2 |
| | | CIE211 | Structure analysis 3 | 2 | - | 2 | C1 | a3,b3,c2,c3 |
| | | | | | | | C2 | a1,c3 |
| | | | | | | | C11 | a1,c1 |
| LEVEL 2 | SEMESTER 2 | CIE212 | Properties and strengthen of concrete materials | 2 | 1 | 1 | C4 | a1,a3 |
| | | | | | | | C11 | a1,a2 |
| | | CIE213 | surveying 1 | 2 | 1 | 1 | C1 | a2, b1 |
| | | | | | | | C11 | a1,C1 |
| | | Total | | 14 | 5 | 8 | | |
| | | BAS221 | Numerical Methods in Engineering | 2 | - | 2 | C1 | a1, a2, b1, b2, c1, c2 |
| | | CIE 221 | Hydrology and Irrigation Engineering | 2 | - | 2 | C1 | a2, a3, b1, b2 |
| | | | | | | | C2 | a1, b1, b2 |
| | | | | | | | C11 | a1, c1 |
| | | | | | | | C12 | b1, b2 |
| | | CIE 222 | Reinforced concrete 1 | 4 | - | 2 | C1 | a3,c2 |
| | | | | | | | C2 | A2,c3 |
| | | | | | | | C4 | a1 |
| | | | | | | | C11 | C1 |
| | | | | | | | C12 | b1 |
| | | CIE 223 | Surveying 2 | 2 | 1 | 1 | C1 | a3,c2 |
| | | | | | | | C11 | a1,c1 |
| | | CIE 224 | Traffic and transportation Engineering | 2 | - | 2 | C1 | a1,c2 |
| | | | | | | | C2 | a2,b2,b3,c3 |
| | | | | | | | C11 | a2 |
| | | | | | | | C12 | b2 |
| | | CIE 225 | | 2 | - | 2 | C2 | a2 |
| | | | | | | | C4 | a1,a2,a3 |



| A. Compulsory | | | | | | | | |
|---------------|------------|---------|--------------------------------------|----------------|------|-------|--------------|-----------------|
| Level | Semester | Code | Course Name | Hours per week | | | Competencies | Program LO'S |
| | | | | Lec. | Lab. | Exer. | | |
| LEVEL 3 | SEMESTER 1 | | principles of Building constructions | | | | C11 | a2 |
| | | CIE 226 | Training 1 * | - | - | - | C3 | a1,a2,a3, b1,c2 |
| | | | | | | | C5 | a1, b1, c1, d1 |
| | | | | | | | C6 | a1, c2 |
| | | | | | | | C7 | d1, d2, d3 |
| | | | | | | | C9 | d1, d2 |
| | | Total | | 14 | 1 | 11 | | |
| | | CIE311 | Reinforced concrete 2 | 4 | - | 2 | C1 | a2 ,c3 |
| | | | | | | | C9 | d1,d3 |
| | | | | | | | C12 | b1 |
| | | CIE312 | Geology and Soil Mechanics1 | 2 | 1 | 1 | C1 | a3, b3, c3 |
| | | | | | | | C2 | a1, c3 |
| | | | | | | | C11 | a1, c1 |
| | | CIE313 | Open Channel Hydraulics | 2 | 1 | 1 | C2 | a1, b1 |
| | | | | | | | C12 | b1,b2 |
| | | CIE314 | Steel Structure Design 1 | 4 | - | 2 | C1 | a3, b3, c3 |
| | | | | | | | C2 | a1, c3 |
| | | | | | | | C9 | d3 |
| | | | | | | | C11 | a1, c1 |
| | | | | | | | C12 | b1 |
| | | CIE315 | High ways and Airport Engineering | 2 | - | 2 | C2 | a2,b2,b3 |
| | | | | | | | C3 | a1,a3,b1 |
| | | | | | | | C11 | a2 |
| | | | | | | | C12 | b2 |
| | | CIE316 | Water supply engineering | 2 | - | 2 | C1 | a3,b2 |
| | | | | | | | C11 | a2 |
| | | | | | | | C12 | b2 |
| | | Total | | 16 | 2 | 10 | | |
| | SEMESTER 2 | BAS321 | Project Management and Control | 2 | - | 2 | C3 | b1,c2 |
| | | | | | | | C9 | d2 |
| | | | | | | | C13 | a1, c1 |
| | | | | | | | C14 | a1,b1,c1 |
| | | CIE321 | Reinforced concrete 3 | 3 | - | 2 | C2 | a2,b1,c3 |
| | | | | | | | C11 | a1,a2 |
| | | | | | | | C12 | b1 |
| | | CIE322 | | 2 | - | 2 | C1 | a3,b2 |



| A. Compulsory | | | | | | | | |
|---------------|------------|--------|---|----------------|------|-------|--------------|---------------------------------|
| Level | Semester | Code | Course Name | Hours per week | | | Competencies | Program LO'S |
| | | | | Lec. | Lab. | Exer. | | |
| LEVEL 4 | SEMESTER 1 | | Soil Mechanics and Foundation | | | | C2 | a2,b2,c3 |
| | | | | | | | C10 | d1,d2 |
| | | | | | | | C11 | a1,a2 |
| | | | | | | | C12 | b2 |
| | | CIE323 | Computer Application in Civil Engineering | 2 | 2 | - | C2 | a1, c1 |
| | | | | | | | C11 | c1 |
| | | CIE324 | Steel Structure Design 2 | 3 | - | 2 | C1 | a1,b3 |
| | | | | | | | C2 | a1 |
| | | | | | | | C5 | d1 |
| | | | | | | | C11 | a1,c1 |
| | | | | | | | C12 | b1 |
| | | CIE325 | Training 2* | - | - | - | C3 | a1,a2,a3, b1,c2 |
| | | | | | | | C5 | a1, b1, c1, d1 |
| | | | | | | | C6 | a1, c2 |
| | | | | | | | C7 | d1, d2, d3 |
| | | | | | | | C9 | d1, d2 |
| | | CIE326 | water and wastewater treatment | 2 | - | 2 | C3 | a2, c1 |
| | | | | | | | C12 | b2 |
| | | | | | | | C13 | c1 |
| Total | | | | 14 | 2 | 10 | | |
| LEVEL 4 | SEMESTER 1 | CIE411 | Foundation Engineering 1 | 2 | - | 2 | C1 | a3,b3,c3 |
| | | | | | | | C4 | a1 |
| | | | | | | | C12 | b1 |
| | | CIE412 | Inland Navigation and Harbor Engineering | 2 | - | 2 | C3 | a1 |
| | | | | | | | C4 | a1 |
| | | | | | | | C11 | a1,a2,c1 |
| | | | | | | | C12 | b1,b2 |
| | | | | | | | C13 | c1 |
| | | CIE413 | Design of Irrigation Works | 2 | - | 2 | C3 | a1, b1 |
| | | | | | | | C11 | a2 |
| | | | | | | | C12 | b1, b2 |
| | | CIE414 | Project 1* | 3 | 2 | - | C2 | a2, b1, b2, b3, b4, c1, c2, c3, |
| | | | | | | | C3 | a1, a2, a3, b1 |
| | | | | | | | C4 | a1, a3, c2, c3 |
| | | | | | | | C5 | b1, c1, d1 |
| | | | | | | | C7 | d1, d2, d3 |
| | | | | | | | C8 | d1, d2 |
| | | | | | | | C11 | a1, a2, c1 |
| | | | | | | | C12 | b1, b2 |
| | | | | | | | C13 | a1, b1, c1 |



| A. Compulsory | | | | | | | | |
|---------------|----------|--------|--------------------------------|----------------|------|-------|--------------|---------------------------------|
| Level | Semester | Code | Course Name | Hours per week | | | Competencies | Program LO'S |
| | | | | Lec. | Lab. | Exer. | | |
| SEMESTER 2 | | CIE415 | Elective 1 | 2 | - | 2 | C14 | a1, b1, c1 |
| | | | | | | | C2 | a1 |
| | | | | | | | C4 | a1,a3 |
| | | | | | | | C11 | a1,a2 |
| | | CIE416 | Elective 2 | 2 | - | 2 | C2 | a2 |
| | | | | | | | C4 | a1,a3,b1 |
| | | | | | | | C11 | a1,a2 |
| | | Total | | 13 | 2 | 10 | | |
| | | BAS421 | Research and Analytical skills | 2 | - | - | C2 | b3,c3 |
| | | BAS422 | Environmental management | 2 | - | 1 | C3 | a2,a3,b1,c1 |
| | | | | | | | C4 | a1,c1,c3 |
| | | | | | | | C10 | d1 |
| | | CIE421 | Legislation and contract | 2 | - | 1 | C3 | b1,c2 |
| | | | | | | | C9 | d2 |
| | | | | | | | C13 | a1 |
| | | | | | | | C14 | a1, b1, c1 |
| | | CEE422 | Reinforced concrete 4 | 2 | - | 2 | C6 | a1 |
| | | | | | | | C11 | a1,a2 |
| | | | | | | | C12 | b1 |
| | | CIE423 | Project 2* | 2 | - | 4 | C2 | a2, b1, b2, b3, b4, c1, c2, c3, |
| | | | | | | | C3 | a1, a2, a3, b1 |
| | | | | | | | C4 | a1, a3, c2, c3 |
| | | | | | | | C5 | b1, c1, d1 |
| | | | | | | | C7 | d1, d2, d3 |
| | | | | | | | C8 | d1, d2 |
| | | | | | | | C11 | a1, a2, c1 |
| | | | | | | | C12 | b1, b2 |
| | | | | | | | C13 | a1, b1, c1 |
| | | | | | | | C14 | a1, b1, c1 |
| | | CIE424 | Elective 3 | 2 | - | 2 | C3 | a1 |
| | | | | | | | C4 | a1 |
| | | | | | | | C12 | b1 |
| | | | | | | | C13 | c1 |
| | | CIE425 | Elective 4 | 2 | - | 2 | C3 | a1 |
| | | | | | | | C4 | a1 |
| | | | | | | | C12 | b1 |
| | | | | | | | C13 | c1 |
| | | Total | | 14 | - | 12 | | |



12.2. Elective Courses

The students should choose one course from each of the following tables:

| Elective 1 | Code | Course name | Competencies | Lo's |
|-------------------|-------------|--|---------------------|-------------|
| CIE415A | | Bridge Engineering | | |
| CIE415B | | Coastal Engineering Fundamentals | | |
| CIE415C | | Concrete Structures Technology | | |
| CIE415D | | Construction Contraction | | |
| CIE415E | | Coast Analysis for Structure Projects | C2 | a2 |
| CIE415F | | Highway Materials and Construction | C4 | a1, a3 |
| CIE415G | | Modern Structure Materials | C11 | a1, a2 |
| CIE415H | | planning of buildings Maintenance and Protection | | |
| CIE415I | | Reliability of Structures | | |
| CIE415J | | Environmental Pollution Control | | |

| Elective 2 | Code | Course name | Competencies | Lo's |
|-------------------|-------------|--|---------------------|-------------|
| CIE416A | | Design of Earthquake Structures | | |
| CIE416B | | Design of Marine Platforms | | |
| CIE416C | | Design of Shell Structures | | |
| CIE416D | | Engineering Project Evaluation | | |
| CIE416E | | Fiber Reinforced Cement Composites | C2 | a2 |
| CIE416F | | Project Decision Analysis | C4 | a1, a3 |
| CIE416G | | Project Financial Management | C11 | a1, a2 |
| CIE416H | | Risk Management and Constructions Safety | | |
| CIE416I | | Air conditioning Systems for Building | | |
| CIE416J | | Construction Estimating and Tendering | | |

| Elective 3 | Code | Course name | Competencies | Lo's |
|-------------------|-------------|---------------------------------|---------------------|-------------|
| CIE424A | | Groundwater Hydraulics | | |
| CIE424B | | Pavement Design | C3 | a1 |
| CIE424C | | Pre- Fabricated Concrete Frames | C4 | a1 |
| CIE424D | | Project Management2 | C12 | b1 |
| CIE424E | | Project Visibility Study | C13 | c1 |
| CIE424F | | Urban Transportation Planning | | |



| | | | | |
|--|---------|----------------------------------|--|--|
| | CIE424G | Special Concrete Structures 1 | | |
| | CIE424H | Foundation Engineering 2 | | |
| | CIE424I | Productivity Enhancement Methods | | |
| | CIE424J | Quality Assurance | | |

| Code | Course name | Competencies | Lo's |
|---------|--|------------------------|----------------------|
| CIE425A | River Engineering | C3 C4 C12 C13 | a1 a1 b1 c1 |
| CIE425B | Hydraulics Engineering | | |
| CIE425C | Traffic Control Systems | | |
| CIE425D | Tunneling and Underground Excavation | | |
| CIE425E | Special Concrete Structures 2 | | |
| CIE425F | Railway Engineering | | |
| CIE425G | Reinforced Concrete 5 | | |
| CIE425H | Design of lighting Systems for buildings | | |
| CIE425I | Soil Dynamics | | |
| CIE425J | Introduction to Earthquake Engineering | | |

13. Programme admission requirements

- Admission to the preparatory year:**
Having Egyptian Secondary education or equivalent certificate with major in Mathematics with the minimum grades determined by the National Admission Office.
- Admission to the Civil Engineering Department:**
At the end of the preparatory year, students should fill an application form to choose the program he/she wishes to join (in a priority sequence). The students are selected according to the total no. of grades attained by each student at the end of the preparatory year. The number of students is determined according to the availability of educational resources.

14. Regulations for progression and program completion

- All Years (except the last year)**
The student is considered successful if he passes the examinations in all courses



of his class.

- The student must get a minimum of 50% to pass each course.
- To pass a level (Year) the student should not fail in more than two courses of his class or from lower classes.

- **Last Year**

- To be graduated, the student must pass all the courses.
- If he fails in one or two courses, not including the project, he has the opportunity to be retested in September, and he must pass these courses to be graduated.
- If the student fails in the project; he must repeat it during the next academic year.

- **The Grades of Success:**

The student achieves one of the following grades in the examinations results and in the general grade according to the marks achieved:

- Excellent: from 85% of the total mark and upwards.
- Very Good: from 75% to less than 85% of the total mark.
- Good: from 65% to less than 75% of the total mark.
- Pass: from 50% to less than 65% of the total mark.

The grades of a failing student in a course are estimated in one of the following grades:

- Weak: from 30% of the total mark to less than 50%
- Very Weak: Less than 30% of the total mark.

Also, the student is failing in exam if he doesn't have at least 30% of final exam maximum grade.

- **Rules for dismissal from the program:**

The student will be dismissed from the institute if the student stops studying without a prior excuse for a period of two semesters, or if he stops studying for the same period despite the rejection of the excuse he provided by the Institute's Board of Directors.

- **Field training evaluation rules:**

The student performs field training approved by the Institute for a period of eight weeks in fields and institutions after completing the second semester exams at the second and third levels. This training aims to link what the student studied at the Institute with practical applications as well as acquiring some skills in the field of specialization.



The distribution of the training degree is as follows:

- 30% of the grand finale is placed by the institute's supervisor
- 30% is set by the training entity's supervisor
- 40% to discuss the report submitted by the student

15. Teaching and Learning Methods

| | | | |
|----|-------------------------|-----|----------------------------|
| 1. | Face-to-face lecture | 8. | Projects |
| 2. | On line Lecture | 9. | Site visits |
| 3. | Flipped Classroom | 10. | Self-learning and research |
| 4. | Presentation and Movies | 11. | Cooperative |
| 5. | Discussion | 12. | Discovering |
| 6. | Problem-solving | 13. | Modeling |
| 7. | Brain storming | 14. | Lab |

Teaching and Learning Methods of Disable Students:

| No. | Teaching Method |
|-----|---------------------------------|
| 1 | Additional Tutorials |
| 2 | Online lectures and assignments |

16. Methods and rules for student evaluation

| Method (tool) | Lo's |
|--|--|
| Periodic Exams | To assess knowledge, understanding, professional and general and transferable skill. |
| Practical / Oral | To assess knowledge, understanding, professional and general and transferable skill. |
| Final Examination | To assess knowledge, understanding, professional and general and transferable skill. |
| Project applied on a practical field problem | To assess knowledge, understanding, professional and general and transferable skill. |

17. Program Evaluation

| Evaluator | Tools | Sample evidence |
|-----------|-------|-----------------|
|-----------|-------|-----------------|



| | | |
|----------------------|----------------|---|
| 1-Senior students | Questionnaires | 15% of the students |
| 2- Alumni | Questionnaires | |
| 3- Stakeholders | Questionnaires | Samples representative from all sectors |
| 4-external evaluator | Review reports | Dated 8/2022 |

18. Civil Engineering Courses CONTENTS

Level: 0 Semester: 1

| BAS011 | Mathematics 1 | 4 Contact Hours | | |
|----------------|--|-----------------|---|-----------------------|
| Content | Algebra: vectors algebra - partial fractions - equations theory - vectors -mathematical deduction - numerical solutions methods (simple repetitive method - Newton and modified Newton's method - intersection method – False position method - arrays - linear equations systems - Gauss Jordan method for deletion. Derivation: function (definition - theories) - basic trigonometric functions and its inverse - exponential and logarithmic functions - hyperbolic functions and its inverse - connection (definition - theories) - limits (definition - theories)- derivatives (definition - theories - higher order types) - curves drawing -mathematical and engineering derivative applications - undefined formulas - Taylor expansion - MacLean expansion - approximation - introduction in partial derivation. | | | |
| Lecture | 2 hours/week | Laboratory | - | Tutorial 2hours /week |

| BAS012 | Mechanics 1 | 4 Contact Hours | | |
|----------------|--|-----------------|---|-------------------------|
| Content | Applications of space vectors – results of group of Forces - momentums - equivalent couples – equivalent groups - equations of equilibrium for rigid bodies - Supports and pivots types - equilibrium under the effect of forces and the space couples - center of mass (groups of particles - flat surfaces) – moment of inertia (mean axes- equal surfaces). | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2hours / week. |

| BAS013 | Physics 1 | Contact 6 Hours | | |
|----------------|---|-----------------|----------------|-----------------------|
| Content | Material properties – Physical quantities – Standard units and dimensions – frequency motion, mechanical properties for materials –fluid properties – viscosity – surface tension–sound waves – waves in elastic media - Heat and thermodynamics: heat transfer – Gas motion theory – First law of thermodynamics – entropy and second law of thermodynamics – temperature measurements and thermometers. | | | |
| Lecture | 2 hours /week | Laboratory | 2 hours / week | Tutorial 2hours /week |



| BAS014 | Engineering Chemistry | 4 Contact Hours |
|----------------|--|------------------------|
| Content | Gaseous status - substantial and heat balance in fuel burning operations and chemical operations - properties of solutions - dynamic balance in physical and chemical operations - kinetic chemical interactions - electric chemistry -introduction to chemical corrosion - water processing - building materials -pollution and its treatment Selected chemical industries: chemical manures - dyes - polymers - sugar -petrochemicals semiconductors - oil, greases and industrial detergents. | |
| Lecture | 2 hours / week | Laboratory |

| BAS015 | Engineering drawing and projection | 5 Contact Hours |
|----------------|--|------------------------|
| Content | Techniques and skills of engineering drawing – engineering operations – orthogonal projection – secondary orthogonal – solid bodies – intersections (cutters for solid bodies – intersections of surfaces) - personals – projections of simple bodies – rules of writing dimensions – drawing of perspectives – deduction of missing projections – drawing of engineering sections. Drawing of the steel frames - binding and fixing devices - the assembled drawing for some mechanical steel components Introduction to AutoCAD Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings. | |
| Lecture | 1 hours / week | Laboratory |

| BAS016 | Introductions to Computer Systems | 4 Contact Hours |
|----------------|--|------------------------|
| Content | Computer architecture – computer systems – files systems – computer networks – internet networks – Database systems and information technology – Computer graphics – multimedia systems – methods of solving problems – logical design for the programs and matrices – applications in programming using one structured or visual languages – using this language in solving the engineering problems. | |
| Lecture | 2 hours / week | Laboratory |

Level 0, Semester 2

| BAS021 | Mathematics 2 | 4 Contact Hours |
|---------------|----------------------|------------------------|
|---------------|----------------------|------------------------|



| | | | | | |
|----------------|---|------------|---|----------|---------------|
| Content | Analytical geometry: equations of second degree and double equation for two straight lines – movement and rotation of axes – groups of unified axes circles – conical sectors (properties of conical sectors - parabola – ellipse – hyperbola) – analytical geometry in space – Cartesian coordinates – cylindrical – spherical – plane in space – equations of surfaces in second order – rotation and movement of axes in space Integration: indefinite integration (basic functions – theories) – method of integration (direct – indirect) - definite integration (definition – properties - theories) – applications of definite integration (plain areas – circular volumes – plain technical length) – areas – circular surfaces – numerical integration. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2hours /week. |

| BAS022 | Mechanics 2 | 4 Contact Hours |
|----------------|---|------------------------|
| Content | Position, displacement, velocity, and acceleration of particle – plane motion path of particle – description of plane motion using Cartesian axes – projectiles - tied motion for particle in straight path – motion in fixed axes - motion in polar axes – relative motion between particles - tied motion for particle in circular path – principle of work and energy of motion– principle of conservation of mechanical energy – principle of impulse and momentum of rigid body. | |
| Lecture | 2 hours / week | Laboratory |

| BAS023 | Physics 2 | 6 Contact Hours |
|----------------|--|------------------------|
| Content | Electricity and magnetism: charge and substance- electric field- column's law- electric flux- Gauss law- electric volt- condenser and insulation materials-current, resistance and electric force – ohm's law and simple circuits- magnetic field- Babot and Savart laws – magnetic flux and gauss law- Faraday law - Magnetic impedance Topics: engineering light – light properties for spherical surfaces – lenses and mirrors – wave properties for light and Hygen's principle - interference - polarization- and diffraction - Nuclear physics: nuclear construction – Bohar theorem – principle of quantum theory- laser – optical – electric phenomenon. | |
| Lecture | 2 hours / week | Laboratory |

| BAS024 | Production Engineering | 5 Contact Hours |
|----------------|---|------------------------|
| Content | The engineering substances and its properties - heating and cooling diagrams – heating equilibrium diagrams - alloys - casting operation (sand casting and the preparation of the mold) – forming processes (cold and hot forming: forging -rolling – wire drawing – blanking and piercing - deep drawing - the extrusion) – processes of metal connections (the riveting – | |



| | | | | | |
|---------|---|------------|----------------|----------|---|
| | welding with its types sticking) – cutting processes (cutting elements – processes – hand machining – automatic cutting machining: lathing - shaping – drilling –milling - grinding – work piece fixation - cutting tools fixation - specifications of the operating machine) – measuring tools (venire caliper – micrometers and its types) – engineering specifications – production cycle – production efficiency - industrial safety – practical training in the different workshops. | | | | |
| Lecture | 3 hours / week | Laboratory | 2 hours / week | Tutorial | - |

| BAS025 | | Introductions to Engineering and Environment | | 6 Contact Hours | | |
|----------------|----------------|--|---|-----------------|---|--|
| Content | | Engineering concepts: What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs. Introduction to environmental science: the importance of studying environmental science – modern technology and its effect on the environment – quality of the environment and development elements – sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise) – economics of environmental pollution control – legislations for the environment protection. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | - | |

| BAS026 | | Technical English Language 1 | | 6 Contact Hours | | |
|----------------|----------------|--|---|-----------------|---------------|--|
| Content | | Intensive guided practice in reading and analyzing expository and argumentative prose and in writing and revising essays that demonstrate coherent logical development, an ability to employ effective strategies of argument and persuasion, and a command of written English appropriate for college-level work | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 1 hour / week | |
| BAS027 | | Human rights | | 2 Contact Hours | | |
| Content | | الإسلام بأهمية حقوق الإنسان والنشأة التاريخية لتلك الحقوق والمدارس الفقهية لتأصيل تلك الحقوق وأحكام الاتفاقيات الدولية الخاصة بحقوق الإنسان، والمنظمات الدولية العالمية والإقليمية القائمة على حماية تلك الحقوق، و موقف الدستور المصري من حقوق الإنسان، والحماية القانونية لها على الصعيد الوطني والصعيد الدولي، بالإضافة إلى حقوق الإنسان في الشريعة الإسلامية . الأصول التاريخية الفلسفية لحقوق الإنسان المصادر الدولية لحقوق الإنسان العالمية والإقليمية - المصادر الوطنية - لحقوق الإنسان الأجهزة العالمية القائمة على حماية حقوق إنسان (أجهزة الأمم المتحدة (الحماية - الوطنية. لحقوق الإنسان حقوق الإنسان في الشريعة الإسلامية عرض بعض طوائف حقوق الإنسان. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | - | |

Level: 1 Semester: 1



| BAS111 | Mathematics 3 | | | 4 Contact Hours |
|----------------|--|------------|---|-------------------------|
| Content | <p>Partial differentiation applications: maximum and minimum values in more than one variable – directional analysis - the directional differential effects - the multi integrations and its applications (the curved and the orthogonal axis) – Gauss- Stokes theory - the endless series and function expansion – basic concepts for the convergence and divergence.</p> <p>Ordinary differential equations: The first order (the equations which can be separated, homogeneous, exact and linear) - the ordinary differential equations from the second order and higher orders (with constant and variable coefficients), systems from the ordinary differential equations– Laplace transfer and its applications in the solution of differential equations.</p> | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2hours / week. |

| BAS112 | Electrical Engineering Fundamentals | | | 5 Contact Hours |
|----------------|---|------------|---|-------------------------|
| Content | <p>Direct Current - Theory of electric circuits- Delta and Star connections - Sine A.C and D.C circuits - Time vectors diagram- Electric power and power factor in A.C circuits - 3-Phase current - Electric machines - D.C machines – Transformers - Induction and synchronous machines - Fractional power machines. Basic concepts of programming: problem analysis and developing the programs charts – structured programming with one programming language - form of the program - repetition - branching - matrix – processes and functions – registers - pointers - connected lists - self repetition - the return. Concepts of object-Oriented programming: Classes, inheritance and message passing, fundamentals of Java programming language and its syntax - major class libraries in Java - Java applets - Graphic User Interface programming – practice on Java programming language.</p> | | | |
| Lecture | 3 hours / week | Laboratory | - | Tutorial 2 hours / week |
| BAS113 | Engineering Thermodynamics | | | 5 Contacts Hours |
| Content | <p>Fundamental concepts - Properties of a pure substance – Equation of state - thermodynamic systems - Work and heat - First law of thermodynamics; Applications to Systems and Control Volumes - Second Law of Thermodynamics; Principle of Carnot cycles; Heat engines, Refrigerators and heat pumps - Principle of the increase of entropy - Applications to systems and control volumes - Irreversibility and availability - Power and refrigeration cycles.</p> | | | |
| Lecture | 3 hours / week | Laboratory | - | Tutorial 2 hours/ week. |

| BAS114 | Technical English Language 2 | | | 4 Contact Hours |
|--------|------------------------------|--|--|-----------------|
|--------|------------------------------|--|--|-----------------|



| | | | | | |
|----------------|---|------------|---|----------|----------------|
| Content | Fundamental concepts - Properties of a pure substance – Equation of state - thermodynamic systems - Work and heat - First law of thermodynamics; Applications to Systems and Control Volumes - Second Law of Thermodynamics; Principle of Carnot cycles; Heat engines, Refrigerators and heat pumps - Principle of the increase of entropy - Applications to systems and control volumes - Irreversibility and availability - Power and refrigeration cycles. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours/ week. |

| CIE111 | Structures Analysis 1 | 5 Contacts Hours |
|----------------|---|------------------|
| Content | Basic concepts in structural analysis - Loads and reactions - Statically determinate beams - Statically determinate rigid frames - Statically determinate arches -Statically determinate trusses - Influence lines for statically determinate structures. | |
| Lecture | 3 hours / week | Laboratory |

| CIE112 | Civil Engineering Drawing 1 | 4 Contact Hours |
|----------------|---|-----------------|
| Content | Introduction to civil engineering drawings: Irrigation works (earth works, crossing of roads, Retaining walls; Brick – plain concrete – Reinforced concrete – Bridges – Culverts – Syphons – Aqueducts – Weirs – Regulators –Escapes) | |
| Lecture | 1 hours / week | Laboratory |

Level: 1 Semester: 2

| BAS121 | Mathematics 4 | 4 Contact Hours |
|----------------|---|-----------------|
| Content | Special functions – Fourier series - periodic functions and Euler's laws – Fourier's integrations – solutions of the differential equations by series - solving the partial differential equations using variables separation. Functions with complex variables – complex quantities algebra– multiple values functions - the analytical functions and Koshi's theorem - the complex series – Taylor and Lorant series - the zeros, unique points and the rest - the infinite series. | |
| Lecture | 2 hours / week | Laboratory |

| BAS122 | Technical Report Writing | 4 Contact Hours |
|----------------|--|-----------------|
| Content | Writing the scientific reports by English language: The principles of report preparation - types of reports – formatting the reports – skills of figures and shapes – importing text – chart drawings – optical scanning for the pictures and documents – the border and notes operations in the | |



| | | | | | |
|---------|--|------------|---|----------|---|
| | reports. Saving and indexing the reports – searching for text – coping and safety of information – using the different computer programs packages for writing and demonstrating the reports. | | | | |
| Lecture | 2 hours / week | Laboratory | 2 | Tutorial | - |

| BAS123 | Introductions to Information Technology | 4 Contact Hours |
|---------|--|--------------------------------------|
| Content | Introduction to the design and use of computer-based information systems - Software and hardware used in information systems - information requirements - Communication systems – Networking - The internet; the foundations, resources and uses of the internet, emphasizing practical skills for finding, reading and authorizing materials - Fundamentals of computer communication networks – Introduction to computer networking elements; communications architectures and protocols, HTML principles and applications - Case studies. | |
| Lecture | 2 hours / week | Laboratory - Tutorial 2 hours / week |

| BAS124 | Strength of Materials | 4 Contact Hours |
|---------|--|---|
| Content | Simple states of stress and strain -Torsion stresses - Bending and shearing stresses in beams - Compound stresses - Analysis of plane stress - Combined stresses - Analysis of thin-walled pressure vessels - Deflection of beams. | |
| Lecture | 2 hours / week | Laboratory 1 hours /week. Tutorial 1 hours /week. |

| CIE121 | Structures Analysis 2 | 5 Contacts Hours |
|---------|---|---------------------------------------|
| Content | Basic concepts in structure mechanics - Normal Stresses - Shear Stresses - Combined and Principal Stresses - Elastic deformations of statically determined structures - Statically indeterminate structures using the three moments equation. | |
| Lecture | 3 hours / week | Laboratory - Tutorial 2 hours / week. |
| CIE122 | Civil Engineering Drawing 2 | 4 Contact Hours |
| Content | Reinforced concrete works (Slabs – Beams – Columns – Foundations). Steel works (Beams and columns sections – compound sections – Beam connections– Beams and columns connections – column bases – trusses). AutoCAD Fundamentals of civil engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and, part dimensioning in 2dimensional drawings. | |
| Lecture | 2 hours / week | Laboratory - Tutorial 2 hours / week. |



Level: 2 Semester: 1

| BAS211 | Engineering Probability and Statistics | 4 Contacts Hours | | | |
|----------------|--|-------------------------|---|-----------------|----------------------|
| Content | Probability theory. Discrete and continuous probability distributions. Statistics in engineering. Descriptive Statistics Sampling distributions. Estimation and confidence intervals. Hypothesis testing. Simple regression. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2hours / week |

| BAS212 | Fluid Mechanics | 4 Contacts Hours | | | |
|----------------|---|-------------------------|----------------------|-----------------|---------------------|
| Content | Fluid properties, fluid statics, kinematics, fluid dynamics including energy and momentum equations, dimensional analysis, laminar flow, turbulent flow and its applications, forces on immersed bodies, introduction to compressible flow, applications to filtration and fluidization. Laboratory course in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes, center of pressure, flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems. | | | | |
| Lecture | 2 hours / week | Laboratory | 1hours / week | Tutorial | 1hours /week |

| BAS213 | Engineering Economy | 3 Contacts Hours | | | |
|----------------|--|-------------------------|---|-----------------|----------------------|
| Content | This course covers the basic concepts of engineering economics as applied to the evaluation of capital investment alternatives in both the private and public sectors of our economy. Attention is given to the time value of money by showing the concepts and techniques for evaluating the worth of products, systems, structures, and services in relation to their cost. Economic and cost concepts: calculating economic equivalence, comparison of alternatives and replacement economy. Economic optimization in design and operations. Cost estimation of products and systems. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 1hours / week |

| BAS214 | Computer Programming | 4 Contacts Hours | | |
|----------------|---|-------------------------|--|--|
| Content | Basic concepts of programming: problem analysis and developing the programs charts – structured programming with one programming language -form of the program - repetition - branching - matrix – processes and functions - registers - pointers - connected lists - self repetition - the return. Concepts of object-Oriented programming: Classes, inheritance and message passing, fundamentals of Java programming language and its syntax – major class libraries in Java - | | | |



| | | | | | |
|---------|---|------------|-----------------|----------|---|
| | Java applets - Graphic User Interface programming -practice on Java programming language. | | | | |
| Lecture | 2 hours /week | Laboratory | 2 hours / week. | Tutorial | - |

| CIE211 | Structures Analysis 3 | 4 Contacts Hours | | | |
|----------------|---|------------------|---|----------|---------------|
| Content | Statically Indeterminate Structures using force method - Slope Deflection Method - Moment Distribution Method - Introduction to Stiffness Method. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2hours / week |

| CIE212 | Properties and Strength of Concrete Materials | 4 Contact Hours | | | |
|----------------|---|-----------------|----------------|----------|-----------------|
| Content | Manufacture and types of cements, properties and grading of aggregates, concrete workability tests and factors affecting the workability, factors affecting concrete strength in tension, compression and flexure, durability of concrete, mix design. Manufacture of bituminous binders, properties of bituminous binders and mixtures, design and uses of bituminous mixtures. Manufacture of steel, composition and structure of steel, heat treatment of steel, alloy steels. | | | | |
| Lecture | 2 hours / week | Laboratory | 1 hours / week | Tutorial | 1 hours / week. |

| CIE213 | Surveying 1 | 4 Contacts Hours | | | |
|----------------|---|------------------|----------------|----------|----------------|
| Content | Introduction to surveying, Mapping Using Linear Measurements, Different Types of Scales, Compass Surveying and Traverse Computations Area and volume Determination. Leveling: Type of levels, method of calculation, Vertical section: Profile and Cross sections, Contouring earth work. Theodolite: temporary and permanent adjustment of theodolite, measuring of horizontal and vertical angles, errors in measuring horizontal and vertical angles. Tachometric surveying: Stadia and Tangential method, Substance bar. Traversing: Omitted observations, link traverse. | | | | |
| Lecture | 2 hours / week | Laboratory | 1 hours / week | Tutorial | 1 hours / week |

Level: 2 Semester: 2

| BAS221 | Numerical Methods in Engineering | 4 Contacts Hours | | | |
|----------------|--|------------------|---|----------|----------------|
| Content | Numerical solution of linear and nonlinear systems - Numerical differentiation and integration - Curve fitting and interpolation - Numerical solution of initial value problems - Boundary and Eigen value problems. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours /week. |



| CIE221 | Hydrology and Irrigation Engineering | 4 Contacts Hours | | |
|----------------|--|------------------|---|-------------------------|
| Content | <p>Hydrology: Hydrologic cycle; Precipitation (types of precipitation – measurements of precipitation – estimates of missing data – double mass curve– mean areal depth of precipitation). Hydrologic losses (evaporation -evapotranspiration – interception –infiltration). Hydrograph (rainfall-runoff relationship – hydrograph – unit hydrograph – S-curve). Irrigation Engineering; water requirements – control and management for distribution of irrigation water – planning and design of irrigation and drainage networks – sprinkler irrigation – drip irrigation – covered drainage.</p> | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week |

| CIE222 | Reinforced Concrete 1 | 6 Contacts Hours | | |
|----------------|---|------------------|---|--------------------------|
| Content | <p>Introduction to reinforced concrete - Design criteria - Design of sections subjected to moments - Bond length between concrete and steel bars - Shear in beams - Design of one way and two-way slabs- Load calculation in slabs and beams.</p> | | | |
| Lecture | 4 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE223 | Surveying 2 | 4 Contacts Hours | | |
|----------------|---|------------------|-----------------|--------------------------|
| Content | <p>Setting out of horizontal and vertical curves. Introduction to theory of errors and error analysis of surveying measurements. Coordinate transformations. Coordinate computations: Intersection, and resection. Modern methods for distance measurements: Electromagnetic Distance Measurement (EDM) and Total Station. Introduction to Geodesy. Introduction to Global Positioning System (GPS)</p> | | | |
| Lecture | 2 hours / week | Laboratory | 1 hours / week. | Tutorial 1 hours / week. |

| CIE224 | Traffic and Transportation Engineering | 4 Contacts Hours | | |
|----------------|--|------------------|--|--|
| Content | <p>Principles of traffic engineering. Road-user and vehicle characteristics. Travel time, speed and volume studies. Highway capacity. Pedestrian, parking and accident studies. Traffic control devices. Intersections and Grade-separations. Cross-section elements, sight distances, and horizontal and vertical alignments. Principles of transportation planning. Transportation</p> | | | |



| | | | | | |
|---------|---|------------|---|----------|-----------------|
| | systems planning and demand analysis. The 3-steps model of urban transportation planning. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE225 | Principles of Building Construction 4 Contacts Hours |
|----------------|--|
| Content | Building construction techniques; conventional methods, construction automation, Prefabricated methods. Architecture drawings and details, steps of the construction of a building, foundations, staircases, roofs, walls, paint, floorings, electrical and plumbing services, principles of architecture – theories – architecture panels details – basic architecture principles (utility – service – ventilation – properties). |
| Lecture | 2 hours / week |

| CIE226 | Training 1 |
|----------------|--|
| Content | Students should spend 4 weeks in field training, after completing the Second level, in any Engineering Institution or Engineering Firms. Students should demonstrate the professional and practical skills they acquired during discussion with their assigned tutors. |
| Lecture | - |

Level: 3 Semester: 1

| CIE311 | Reinforced Concrete 2 4 Contacts Hours |
|----------------|--|
| Content | Design of hollow block slabs - Design of sections subjected to torsion - Design of flat slabs - Design of paneled beam slabs - Design of stairs. |
| Lecture | 4 hours / week |

| CIE312 | Geology and Soil Mechanics 1 4 Contacts Hours |
|----------------|---|
| Content | Geology; Sources and Processes for geological component needed for construction, minerals and rocks types. Structure geology and influence of geological features on engineering works. Soil Physical properties; Soil Formation, Weight–Volume Relationships, Plasticity and Structure of Soil, Classification of Soil, Soil Compaction. Soil Mechanical properties; permeability, seepage, Stress Distribution, Consolidation, Shear strength, Various laboratory experiments are performed to illustrate the basic principles of soil mechanics. |
| Lecture | 2 hours / week |



| CIE313 | Open Channel Hydraulics | 4 Contacts Hours |
|----------------|--|---|
| Content | Basic concepts (section properties – classification of flow – parallel and curvilinear flow – Saint Venant equations – velocity distribution – velocity coefficients – boundary layer). The energy principles (specific energy and specific discharge – the transition problem – choking phenomena – control section – discharge measuring). The momentum principles (hydraulic jump –momentum function – jump classification – surge in open channel). Flow resistance (shear stress on wetted perimeter – resistance equations – channels with composite roughness). Gradually varied flow (types of slopes – dynamic equation of G.V.F – classification of flow profile – methods of computations).Design of channel for uniform flow (erodible and non-erodible channels – best hydraulic sections – maximum permissible velocity method – tractive force method). | |
| Lecture | 2 hours / week | Laboratory 1 hours / week. Tutorial 1 hours / week. |

| CIE314 | Steel Structures Design 1 | 6 Contacts Hours |
|----------------|--|---------------------------------------|
| Content | Design of steel structures; Tension and compression members; Beams; Beam-columns; Built-up members; Plate girders; Connection; Design practice; Tutorial design workshops. | |
| Lecture | 4 hours / week | Laboratory - Tutorial 2 hours / week. |

| CIE315 | Highways and Airport Engineering | 4 Contacts Hours |
|----------------|---|---------------------------------------|
| Content | Strength & stabilization of subgrade soils. Unbound materials characterization. Sources of asphalt, characteristics of asphalt binder and asphalt mixtures. Design of asphalt mixtures. Design of Flexible and Rigid pavements. Pavement drainage. Introduction to Airport Engineering. Aircraft characteristics. Air traffic control. Airport configuration, components, and capacity. Design of airport components. | |
| Lecture | 2 hours / week | Laboratory - Tutorial 2 hours / week. |

| CIE316 | Water Supply Engineering | 4 Contacts Hours |
|----------------|--|---------------------------------------|
| Content | Sources of water supply - drinking water standards, quality requirement, groundwater collecting; Design of Collection, purification and distribution Works; screening coagulation and flocculation, sedimentation, filtration, disinfection, softening removal, taste and odor removal, underground and elevated tanks. Design of distribution networks. Cold water systems. | |
| Lecture | 2 hours / week | Laboratory - Tutorial 2 hours / week. |



Level: 3 Semester: 2

| BAS321 | Project Management and Control | | | 4 Contacts Hours | |
|----------------|--|------------|---|------------------|-----------------|
| Content | Introduction to Project Management – Project Planning and Scheduling –Network based Scheduling – Critical Path Method (CPM) – Program Evaluation & Review Technique (PERT) – Probability Aspects of Project Completion Time – Project Cost Control - Resource Allocation – For casting Funds Requirements. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE321 | Reinforced Concrete 3 | | | 5 Contacts Hours | |
|----------------|--|------------|---|------------------|-----------------|
| Content | Design of halls with beam girders - Design of frames - Design of arches - Design of trusses and Vierendeel girder - Design of saw tooth roofs. | | | | |
| Lecture | 3 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE322 | Soil Mechanics and Foundation | | | 4 Contacts Hours | |
|----------------|---|------------|---|------------------|-----------------|
| Content | Stresses in soil and compressibility; Settlement and Contact Pressure - Consolidation of soil - Ground Improvement -Lateral Earth Pressure and Stability of Slopes - Bearing Capacity - Subsoil Investigation. Foundation Design; Introduction to Foundation Engineering, Design of Strip, Isolated, Combined footing, Strap beam and Raft foundations. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE323 | Computer Applications in civil Engineering | | | 4 Contacts Hours | |
|----------------|--|------------|---|------------------|-----------------|
| Content | Use the computer in the analysis of structural problems; concrete beams, columns and slabs; steel beams, columns and beam-columns – and in the analysis of water resources and environmental engineering problems. Computation of uniform and gradually varied flows in open channels. Pipe network design. Sewer system modeling. Design of water and wastewater treatment facilities for each area, the necessary theoretical background reviewed and discrete modeling methods as implemented in computer programs discussed and applied to selected problems. Extensive use of microcomputers. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE324 | Steel Structures Design 2 | | | 5 Contacts Hours | |
|----------------|---|--|--|------------------|--|
| Content | Steel frames design – riveted and bolted connections – high strength bolted connections – welded constructions – base connections – roof trusses – rigid frames design. | | | | |



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|----------------|-----------------------|-------------------|---|-----------------|------------------------|
| Lecture | 3 hours / week | Laboratory | - | Tutorial | 2 hours / week. |
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|----------------|---|-------------------|------------------------|-----------------|-------------------------|
| CIE325 | Training 2 | | | | |
| Content | Students should spend 6 weeks in field training, after completing the Third level, in any Engineering Institution or Engineering Firms. They should prepare a technical report implying a full description of the processes they joined for training. Students should demonstrate the professional and practical skills they acquired during discussion of report with their assigned tutors. | | | | |
| Lecture | - | Field | 35 hours / week | Tutorial | - |
| CIE326 | Water and wastewater treatment | | | | 4 Contacts Hours |
| Content | Introduction to sewerage works. Characteristics and sources of wastewater; domestic, industrial, rain and infiltration. Calculation of discharges. Design of sewer pipes and manholes. Pump stations. Collection works of sewerage system. Primary and secondary treatment. Sludge treatment and disposal. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

Level: 4 Semester: 1

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|----------------|--|-------------------|---|-------------------------|
| CIE411 | Foundation Engineering 1 | | | 4 Contacts Hours |
| Content | Introduction to Deep foundations; Pile types, piles classifications, Design of pile foundation, pile loading and pile capacity, Geotechnical pile capacity, Lateral load capacity of piles, pile settlement, pile loading tests, Design of pile cap. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial |

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|----------------|--|-------------------|---|-------------------------|
| CIE412 | Inland Navigation and Harbor Engineering | | | 4 Contacts Hours |
| Content | Kinds of Harbors, Studies of the Natural Phenomena, Quays, Hydraulic Model Studies, Planning of Harbors, Light Houses and Guiding Signals, Breakwaters, Spillways, Dry Docks, Inland Navigation. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial |

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|----------------|---|--|--|-------------------------|
| CIE413 | Design of Irrigation Works | | | 4 Contacts Hours |
| Content | Introduction to irrigation works, design of crossing structures (Culverts, bridges, syphon, aqueducts). Retaining walls (Gravity, cantilever, and | | | |



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|---------|--|------------|---|----------|-----------------|
| | counterfort). Design of floor for heading up works and stilling basic brief idea on navigation structures (locks). | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE414 | Project 1 * | 5 Contacts Hours | | |
|---------|---|------------------|-----------------|------------|
| Content | The graduation project aims to explore students' ability and skills to comprehensively address and manage architectural and technical issues associated with a large-scale design project. The project examines and measures students' knowledge, skills, and collective outputs gained throughout their study in the faculty and department in a combined manner, that reflects identity and creativity in all its preliminary and analytical phases. A complete set of appropriately presented drawings, accompanied by a detailed report of the project's attributable studies and potential considerations should be implemented by each student. | | | |
| Lecture | 3 hours / week | Laboratory | 2 hours / week. | Tutorial - |

| CIE415A | Bridge Engineering | 4 Contacts Hours | | |
|---------|--|------------------|---|--------------------------|
| Content | Different types of bridges – different methods in bridges construction – load calculations and its different effects – methods of bridges design using the standard specifications codes – using commercial computer packages for bridge design. Planning of bridge projects; Design, analysis and construction of various types of bridges including reinforced and pre stressed concrete bridges, steel bridges, composite bridges, and cable-supported bridges. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE415B | Coastal Engineering Fundamentals | 4 Contacts Hours | | |
|---------|---|------------------|---|--------------------------|
| Content | Effect of waves on coastal structures, design of seawalls and breakwaters, jetties, harbors, ship channels and pipelines, intentional and accidental discharge of pollutants, diffusion and spreading, oil spill containment and collection, wave theory and applications to engineering problems, analysis of wave data. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE415C | Concrete Structures Technology | 4 Contacts Hours | | |
|---------|--|------------------|--|--|
| Content | Concrete mixing method, mixing time, delivery, pumping and casting. Concrete casting method and precautions. Concrete compaction method. Concrete surface finishing. Concrete curing method, curing time and precautions. Casting concrete in hot weather and its precautions. Self- | | | |



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|---------|--|------------|---|----------|-----------------|
| | compact concrete manufacturing, pumping, casting and testing. Hot weather concrete. Special type of concrete. Quality control. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE415D | Construction Contraction | 4 Contacts Hours | | |
|---------|---|------------------|---|--------------------------|
| Content | Construction contracting for contractors, architects, owners. Organization and administration; industry structure, construction contracts, bonds, insurance. Planning, estimating, and control, quantity takeoff and pricing, labor and equipment estimates, estimating excavation and concrete, proposal preparation, scheduling, accounting and cost control. Students use contract documents to prepare detailed estimate. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE415E | Cost Analysis for Structure projects | 4 Contacts Hours | | |
|---------|--|------------------|---|--------------------------|
| Content | Direct costs – indirect costs – collective systems - comparisons between projects – fundamentals of cost analysis for wood, steel and concrete buildings– preparing project and report writing – case study. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE415F | Highway and Airport Engineering | 4 Contacts Hours | | |
|---------|--|------------------|---|--------------------------|
| Content | Application of soil classification methods, material characterization, sub-grade and sub-base stabilization, material variability and quality control, pavement evaluation and rehabilitation, highway construction. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE415G | Modern Structure Materials | 4 Contacts Hours | | |
|---------|---|------------------|---|--------------------------|
| Content | High strength concrete. High performance concrete. Ultra-high strength concrete. Ultra-high-performance concrete. Light weight concrete. Supplementary cementing materials. Compound materials and their applications. Insulating materials | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE415H | Planning of Buildings Maintenance and Protection | 4 Contacts Hours | | |
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|----------------|---|------------|---|----------|-----------------|
| Content | Building maintenance important, objective, type, planning, cost and problem. Types of cracks and damages. Non-destructive test. Repairs and protection materials. Method and techniques of repair. Isolation of buildings and structural elements against moisture. Technical reports | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|--|-------------------------|
| CIE415I | Reliability of Structures | 4 Contacts Hours |
| Content | Fundamental concepts related to structural reliability, safety measures, load models, resistance models, and system reliability. Optimum safety levels and optimization of design codes. | |
| Lecture | 2 hours / week | Laboratory |

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|----------------|--|-------------------------|
| CIE415J | Environmental Pollution Control | 4 Contacts Hours |
| Content | Quality factors for environmental control. Population and resource use. Air pollution, water pollution, land pollution. Solid waste management. Thermal pollution, noise pollution. Radiation. Energy and the environment. Prediction and assessment of environmental impact. Problems of developing nations. Case studies | |
| Lecture | 2 hours / week | Laboratory |

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|----------------|--|-------------------------|
| CIE416A | Design of Earthquake Structures | 4 Contacts Hours |
| Content | Earthquakes: causes, seismic waves, scales, equation of motion for single degree of freedom and multi-degree of freedom systems – Structures behavior under random forces – Spectral analysis depending on soil conditions – Modal analysis for multi-strong buildings – design principles for earthquake structures according to the Egyptian code. | |
| Lecture | 2 hours / week | Laboratory |
| CIE416B | Design of Marine Platforms | |
| Content | Marine platform (definition – types), loads affecting the marine platforms – tide and wind forces – design of fixed marine platforms. | |
| Lecture | 2 hours / week | Laboratory |

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|----------------|---|-------------------------|
| CIE416D | Engineering Project Evaluation | 4 Contacts Hours |
| Content | Fundamentals of project appraisal and feasibility study; Planning of civil engineering projects; Economic analysis of civil engineering projects; | |



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|---------|--|------------|---|----------|-----------------|
| | Introduction to environmental impact assessment and social impact assessment; Case studies on civil engineering project appraisal. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE416E | Fiber Reinforced Cement Composites | 4 Contacts Hours | | |
|---------|--|------------------|---|--------------------------|
| Content | Fiber-reinforcement of cement-based matrices, continuous and discontinuous fibers, and meshes. Fiber-reinforced concrete and Ferrocement. Laminated cementsations composites. Behavior and mechanical properties. Mechanics of fiber reinforcement. Constitutive models. High-strength, high-performance fiber composites. Hybrid and smart composites. Lectures, projects and laboratory. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE416F | Project Decision Analysis | 4 Contacts Hours | | |
|---------|---|------------------|---|--------------------------|
| Content | Quantitative methods of decision-making. Important mathematical models useful in decision processes. Model-structure assumptions, limitations and methods for use. Concepts and models of support systems for management decision problems. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE416G | Project Financial Management | 4 Contacts Hours | | |
|---------|---|------------------|---|--------------------------|
| Content | Cash flow and its analysis -project budget - project financial methods - risk and cost control - financial path for project - time value - profit rate - inflation effects. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE416H | Risk Management and Constructions Safety | 4 Contacts Hours | | |
|---------|--|------------------|---|--------------------------|
| Content | Principles and practice regarding safety in building, Accidental prevention and safety control. Fire control. Fire resistance of building materials, safety provisions for fire and other hazards in building. Safety standards and codes. Governmental regulations and inspection procedures. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE416I | Air Conditioning Systems for Building | 4 Contacts Hours | | |
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|----------------|---|------------|---|----------|-----------------|
| Content | Psychometric and process of air. Cooling load estimation. Refrigeration cycles. Water chiller systems. Air handling system. Cooling towers. Equipment selection. Installation, operation and maintenance of air conditioning systems. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE416J | Construction Estimating and Trending | 4 Contacts Hours | | |
|----------------|---|-------------------------|---|--------------------------|
| Content | Principles of construction cost estimating; Quantity takeoff; Methods of detailed cost estimating; Analysis of labor and equipment costs; Construction tendering process; Bidding and contracting systems for construction projects; Laws and regulations related to the construction industry. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

Level: 4 Semester: 2

| BAS421 | research and analytical skills | 2 Contacts Hours | | |
|----------------|--|-------------------------|---|-------------------------|
| Content | Analysis Skills: Framework for analyzing engineering problems taking into account technical, economic, environmental, and ethical issues. Phases of problem solving (Understanding the problem and formulating it, Solution plan, Implementation plan, Evaluation, and Revision). Role of creativity in the analysis. SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis for different alternatives. Detailed Cost - Benefit analysis and Risk analysis. Role of cooperation and team - work in analyzing large engineering problems. Importance of finding the relevant data, information, and knowledge. Search Skills: Basic Web search methods and how to formulate search engine queries using logical connectives (e.g. AND, OR, NOT). Phrase, title, domain, URL, and link search. Evaluating search results, choosing the appropriate search engine. Importance of evaluating the credibility of the different Web sites. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial - |
| BAS422 | Environmental Management | | | 3 Contacts Hours |
| Content | The importance of studying environmental science – modern technology and its effect on the environment – quality of the environment and development elements – sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution – noise) – economics of environmental pollution control – legislations for the environment protection. | | | |
| Lecture | 1 hours / week | Laboratory | - | Tutorial 2 hours / week |

| CIE421 | Legislation and contracts | 3 Contacts Hours | | |
|--------|----------------------------------|-------------------------|--|--|
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|----------------|--|-------------------|----------|-----------------|------------------------|
| Content | <p>التشريعات والقوانين في صناعة البناء – تعريفات) الجوانب التشريعية والقانونية في صناعة التشييد- المفاهيم القانونية في مجال عقود التشييد – عقود التشييد وأنواعها – الأنواع المختلفة لعقود المقاولة- أنواع الالتزام في عقد المقاولة (تبصر المهندس بمسؤولياته وحقوقه التي ينظمها القانون وتحدد علاقته بأطراف مثل التشييد) المالك – المقاول – المهندس .)</p> <p>استعراض بنود القانون المدني الخاصة بعقد المقاولة من ماده (646) وحتى ماده (667)</p> <p>استعراض بعض القوانين والتشريعات التي تتعرض للعمل الهندسي ولوائحها وشرحها نظرياً واعطاء بعض الأمثلة التطبيقية على سبيل المثال قانون البناء الموحد وقانون المناقصات والمزايدات.</p> | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 1 hours / week. |

| CIE422 | Reinforced Concrete 4 | 4 Contacts Hours | | | |
|----------------|--|-------------------------|----------|-----------------|------------------------|
| Content | Design of water structures - Design of concrete sections subjected to moments without cracking - Design of rectangular tanks - Design of circular tanks - Design of elevated tanks | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE423 | Project 2 * | 6 Contacts Hours | | | |
|----------------|--|-------------------------|----------|-----------------|------------------------|
| Content | Continuation and conclusion of the investigations on the civil problems of Project 1; written reports and team presentations are required. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 4 hours / week. |

| CIE424A | Groundwater Hydraulics | 4 Contacts Hours | | | |
|----------------|---|-------------------------|----------|-----------------|------------------------|
| Content | Fundamentals of Groundwater and Properties of Soil (types of aquifers – porosity – rock and water – degree of saturation – hydraulic conductivity and intrinsic permeability). Groundwater movement and well hydraulics (Darcy law– direction of the hydraulic gradient – groundwater recharge – seepage through porous media – homogeneity and isotropy – flow in stratified media – steady and unsteady flow toward a well in various types of aquifers) . Well design and construction (well design – well construction and maintenance). Saltwater intrusion in coastal aquifers (introduction – Ghyben-Herzberg equation –formulation of saltwater intrusion – modeling of saltwater intrusion – theory of images – controlling of saltwater intrusion). | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE424B | Pavement Design | 4 Contacts Hours | | |
|----------------|--|-------------------------|--|--|
| Content | Characteristics of pavement loads, stress analysis in pavements, design practices, construction, rehabilitation and maintenance, optimization of the design of rigid and Flexible pavements systems, empirical and | | | |



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| | mechanistic stochastic structural subsystems, utility theory, serviceability concept, cost studies, traffic delay, environmental deterioration, and rehabilitation and maintenance optimization systems. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE424C | Pre-fabricated Concrete Frames | 4 Contacts Hours | | |
|----------------|--|------------------|---|--------------------------|
| Content | Prefabricated concrete performance – design of concrete supported to shear stress – design of Columbus – roofs and building frame – design project using the computer – detailed report. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE424D | Project Management 2 | 4 Contacts Hours | | |
|----------------|--|------------------|---|--------------------------|
| Content | Construction Projects Work Breakdown Structure (WBS) – Time Planning and Scheduling Techniques: “Networks – Line of Balance Method for Repetitive Units Projects” – Cash Flow – Cost Planning: “Cost Estimation – Cost Control” – Using Computer Programs in Construction Project Management | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE424E | Project Visibility Study | 4 Contacts Hours | | |
|----------------|---|------------------|---|--------------------------|
| Content | The importance of visibility study for the projects - the definition of the visibility study and the historical development for it - the project essence and its principles and forms – initial visibility studies and its elements - environmental visibility studies - important financial sides in visibility study - the important monetary sides in visibility study - the important marketing sides - the exhibition of the products and the effective parameters in it - the pricing policies - the situation of the government, the consumer and the competitive projects - the engineering and technical visibility for the project - study of the social visibility – evaluation methods of the visibility study. | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial 2 hours / week. |

| CIE424F | Urban Transportation Planning | 4 Contacts Hours | | |
|----------------|---|------------------|--|--|
| Content | Land use-transportation interaction. The process of urban transportation planning, urban transport problems, goals, and objectives, data and information, survey design, travel demand forecasting: 1) trip generation, 2) trip distribution, 3) modal choice, 4) route assignment. The evaluation of urban transport systems, transport system management, demand management, and control. | | | |



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| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |
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|----------------|---|------------|---|-------------------------|-----------------|
| CIE424G | Special Concrete Structures 1 | | | 4 Contacts Hours | |
| Content | Introduction to tall building structures. Design criteria for tall building structures. Loading. Structural formation. Modeling for analysis. Braced frames. Rigid frames. Shear walls. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|---|------------|---|-------------------------|-----------------|
| CIE424H | Foundation Engineering 2 | | | 4 Contacts Hours | |
| Content | Soil Hydraulics; Introduction to soil hydraulics - hydraulic Conductivity determination - Flow through porous media - One dimensional flow two dimensional flows. Deep foundation; Sheet pile design - Determination of pile capacity - Design of pile cap - Retaining walls. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|--|------------|---|-------------------------|-----------------|
| CIE424I | Productivity Enhancement Methods | | | 4 Contacts Hours | |
| Content | Identification of bottlenecks; impact of human performance on productivity. Effect of the interaction between technological advances and human capabilities on performance and productivity. Cost reduction and productivity improvement programs. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|---|------------|---|-------------------------|-----------------|
| CHE424j | Quality Assurance | | | 4 Contacts Hours | |
| Content | Reliability of parallel and serial engineering systems. Life testing. Impact of reliability on the design process in engineering fields such as mechanical, electrical and structural engineering. Studies the effect of equipment reliability on product quality | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|---|------------|---|-------------------------|-----------------|
| CIE425A | River Engineering | | | 4 Contacts Hours | |
| Content | Classifications of rivers, data collection method; Velocity and flow rate measurement, design of hydraulic structures: dike, spillway, dam, gate, pumping station, sheet pile, Countermeasure on sediment control: corrosion, deposition, scour, bill of quantity and cost estimation, operation and maintenance. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |



| CIE425B | Hydraulics Engineering | | | 4 Contacts Hours | |
|----------------|--|------------|---|------------------|-----------------|
| Content | Basic governing equations of fluid flow (Bernoulli – continuity – application) Flow through orifices (types of orifices – venacontracta – hydraulic coefficients – flow through different types of orifices – time for filling and emptying tanks). Flow over weirs (types of weirs – flow over different types of weirs). Momentum equation (application of momentum equation). Steady flow in pipelines (basics of flow in pipelines – hydraulic analysis of pipe network). Unsteady flow in pipelines (water hammer – Euler equation – continuity equation – application). Hydraulic machinery (design of pump station) | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE425C | Traffic Control System | | | 4 Contacts Hours | |
|----------------|---|------------|---|------------------|-----------------|
| Content | Introduction to existing and new traffic control systems strategies including both off-line signal optimization techniques and real-time computer traffic-responsive control concepts. Control concepts and methods for signal intersections, arterial systems and area traffic networks. Traffic control system evaluation techniques using Measures of Effectiveness (M.O.E.) for single intersections, arterial, and networks. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE425D | Tunneling and Underground Excavation | | | 4 Contacts Hours | |
|----------------|--|------------|---|------------------|-----------------|
| Content | Introduction to tunnels –numerical methods in tunnel constructions– computer software packages and its applications in tunnels. Tunneling and excavations in hard rock - basic rock mechanics, shape, size and orientation of an opening, elastic deformation and the Kirsch solution, rock mass classification, support design and ground reaction curve, drill and blast method, NATM tunneling method. Tunneling in soft ground - problems of urban tunneling, deformation and surface settlement, load on liners, face stability, methods of soft ground tunneling including EPB and slurry shield methods. Selection of methods of attack for excavation of tunnels and deep vertical sided openings. Tunneling procedures based on behavioral characteristics of soil and rock, study of tunnel boring machines, shielded and drill-and-blast operations, linings, soil linear interaction. Deep excavation procedures related to support of excavation systems, methods of installation and dewatering. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

| CIE425E | Special Concrete Structures 2 | | | 4 Contacts Hours | |
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|----------------|--|-------------------|---|-----------------|------------------------|
| Content | Introduction to Composite construction – materials of composite constructions – simply supported composite beams – continuous beams – The shear connections – composite columns – composite slabs. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|--|-------------------|---|-------------------------|------------------------|
| CIE425F | Railway Engineering | | | 4 Contacts Hours | |
| Content | Engineering principles for railways planning – railways components and specifications – design of different parts of railways – types of stations – types of signals – maintenance – planning of the railway's lines – transportation economy –management and insurance. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|---|-------------------|---|-------------------------|------------------------|
| CIE425G | Reinforced Concrete 5 | | | 4 Contacts Hours | |
| Content | Design of shell structures - Design of Pre-stressed reinforced concrete | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week. |

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|----------------|--|-------------------|---|-------------------------|-----------------------|
| CIE425H | Design of Lighting Systems for Buildings | | | 4 Contacts Hours | |
| Content | Principles of lighting, lighting design for buildings which includes artificial lighting, point, line and area light sources, types and properties of luminaries, polar curves, design methods and calculations, glare index, lighting design standard, luminaries heat recovery system and lighting energy management, hybrid lighting, day lighting of buildings, effect of climate on lighting. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week |

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|----------------|--|-------------------|---|-------------------------|-----------------------|
| CIE425I | Soil Dynamics | | | 4 Contacts Hours | |
| Content | Introduction to Soil Dynamics: Fundamentals of vibrations – Soil dynamic properties – Soil liquefaction – Propagation of waves – Analysis of seismic response– Soil –structure dynamic interaction | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week |
| CIE425J | Introduction to Earthquake Engineering | | | | |
| Content | Introduction to Earthquake Engineering: Properties of earth motion – Tectonic Plates – Seismic waves – Faults – Magnitude scale Intensity scale – Measuring earthquake – Earthquake risk – seismic maps – International codes provisions for seismic design of structures included Egyptian code of practice for Soil Mechanics and Foundation Design. | | | | |
| Lecture | 2 hours / week | Laboratory | - | Tutorial | 2 hours / week |

Appendix 1: Matrix of Courses Vs Competencies and aims for Civil engineering program.



وزارة التعليم العالي
المعهد العالي للهندسة والتكنولوجيا
بدمياط الجديدة



- Appendix 2: Matrix of Competencies Vs aims for Civil engineering program.*
- Appendix 3: Matrix of attributes Vs program aims for Civil engineering program.*
- Appendix 4: Matrix of mission and goals of the institute Vs competencies for Civil engineering program.*
- Appendix 5: Matrix of mission and goals of the institute Vs aims for Civil engineering program.*
- Appendix 6: Matrix of Competencies Vs Teaching and Learning Methods.*
- Appendix 7: Matrix of Methods and rules for student evaluation Vs Teaching and Learning Methods.*

Program Coordinator: Prof. Mohamed Elkiki

Head of Department: Prof. Mohamed Elkiki

Date of Approval: 10/2023