

COURSE SYLLABI FOR AE PROGRAM

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1. Course Number and Name

ARC 111 – Arts & Architecture

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Qormod, Abdullah

4. Textbook and Supplemental Materials

- "Islam Art And Architecture "2007,markus hattstien, CHINA, the American university

5. Course Information

Catalog Description: History of Arts, Fine Arts (Painting - Sculpture - Ornaments.... etc.), Artistic Movements in the twentieth century: Cubism, Expressionism, Futurism and Surrealism. Artist groups like de Stijl and Bauhaus and their new ideas about the interrelation of the arts, architecture, design, and art education. Trends of Art through historical eras and parallel trends of Architecture - Contemporary trends of Art and its influence on architecture. Values in art works (contrast, balance, proportion, color, rhythm, movement,...), Artistic values and design principles in architecture.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify the architectural style in order to implement its characteristics through collective research.
- Identify the learn about ancient arts and art movements , and twentieth century (Cubism - Expressionism, Futurism, Surrealism).
- Analyze and discuss all art collections (De Stijl school - Bauhaus) in art, architecture and design through collective research.
- Apply the trends in arts and architecture
- Identify the phenomenon of morphology and design through it.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- History of Arts, Fine Arts (Painting - Sculpture – Ornaments
- Artistic Movements in the twentieth century: Cubism, Expressionism, Futurism and Surrealism.
- Artist groups like de Stijl and Bauhaus and their new ideas about the interrelation of the arts, architecture, design, and art education.
- Trends of Art through historical eras and parallel trends of Architecture - Contemporary trends of Art and its influence on architecture.
- Values in art works (contrast, balance, proportion, color, rhythm, movement,...),
- Artistic values and design principles in architecture

1. Course Number and Name

ARC 112 – Visual Training & Freehand Drawing

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Thabet, Ahmed & Mersal, Amira.

4. Textbook and Supplemental Materials

- White, Edward T., A Vocabulary of Architectural Forms, Architectural Media, 1975.
- Linton, Harold, Color Model Environments: Color and Light in Three-Dimensional Design, Harold Linton, 1985.
- Architect, sketchbooks 2018 Thames & Hudson United Kingdom wily jones
- architectural models 2008 dom islanda prgeone
- hand- drawing design 2013 Rual Haihong CHINA.huazhong
- perspective prjections & design, mario carpo, routiedge, NewYORK, 2008.
- Form, Space, and order 2nd edition 2006, Ching

5. Course Information

Catalog Description: The course develops the student's sense of proportions and scale. It improves his freehand skills and aesthetic values. It focuses on practicing different techniques of presentation. The course introduces the presentation techniques for sketching and drawing 3D objects.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Improving the visual image of proportion and proportional relationships for architecture students and benefiting from them in intellectual and technical support for the architectural design process.
- Gain freehand drawing skills, shadows, shading, col use, and architectural design.
- Recognize and practice different display techniques using different tools and media to improve manual skills and aesthetic values.
- Designing flats and models of different proportions and scale, and showing them with lead and colours.
- Using students' sense of proportions and scale in free drawing and manual skills through making architectural models and drawings
- Analysing and critiquing the works of participating artists to extract the appropriate criteria to show architectural projects professionally.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- The sense of proportions and scale.
- Freehand skills and aesthetic values.
- Different techniques of presentation: pencil drawing, ink drawing, watercolor drawing.
- The Presentation Techniques for Sketching and Drawing 3D Objects.
- Communication ideas visually with others.
- Present architectural project professionally.
- Visual analysis of the formation and fundamentals of design.

1. Course Number and Name

ARC 113– Sciagraphy & Perspective

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Thabet, Ahmed & Hassan, Hisham

4. Textbook and Supplemental Materials

- Mc Goodwin, Henry, Architectural Shades and Shadows, American Institute of Architects press, 1991.
- Shafie, Zakia, Architectural perspective, Cairo University press, 1977.
- ikonen der weltarchitektur, 2012, werner blaser, New YORK, niggli
- perspective prjections & design, 2008, mario carpo, New YORK, routiedge
- Shade, Shadows and Perspective, 1975, Eng. Abdelrahman Nassar

5. Course Information

Catalog Description: Study the principles of casting the shades and shadows of objects and architectural elements. Study the methods of drawing one vanishing point and two vanishing point perspectives. Three dimensional presentations in terms of perspective.

Prerequisites: None. **Corequisites:** None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Study the principles of casting the shades and shadows of objects and architectural elements in different application in architecture.
- Apply presentation of architectural elements and forms through the shade and shadow.
- Study the methods of drawing perspective: two points perspective.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

7. List of Topics

The major topics covered in this course are:

- The role of shades and shadows in the visualization of object.
- Presentation of architectural elements and forms through the shades and shadows
- The methods of drawing one vanishing point perspectives.
- The methods of drawing two vanishing point perspectives.
- Three-dimensional presentation in terms of perspective
- Representation of architectural objects using shades and shadows in perspective
- Studding the science of sight Cone and venation points / Shadows angles

1. Course Number and Name

ARC 121 – History & Theory of Architecture 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Desouki, Mahmoud

4. Textbook and Supplemental Materials

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Ching, Francis D.K., Architecture: Form, Space and Order, Van Nostrand Reinhold Company, New York, 1996.
- Fletcher, Banister, A History of Architecture on the Comparative Method, 20th.
- "A History of Architecture", Dan Cruickshank, The royal institute of british architects, india, 1998.

5. Course Information

Catalog Description: Unit 1: Introduction to Architecture, Design objectives, standards and criteria, potentials and constraints. Architectural composition: line, plane, volume. Space treatments: light, texture, color. Space organization. Unit 2: History of Architecture: The relation between the architectural concept, the philosophy of design, the effect of physical, cultural, natural and constructional possibilities through a comparative analytical study for different old cultures and classical ages.

Prerequisites: None. **Corequisites:** None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Practicing presentation skills
- Recognize the design philosophy of the historical architecture in its context, plus reviewing design standards and basics.
- Apply theories of architecture on group design project.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. List of Topics

The major topics covered in this course are:

- Introduction of Architecture.
- Standards and rates of design and capabilities and limitations and durability and utility and beauty standards and rights
- Elements of horizontal and vertical movement
- Architectural configuration: line and level and block and tackle voids and light and texture and color
- The relationship between the concept of Architecture and Design Philosophy
- Comparison of various ancient cultures: Egyptian and West Asia and the Babylonian and Assyrian and Persian

1. Course Number and Name

ARC 122 – History & theory of architecture 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Turky, Asim & Mersal, Amira.

4. Textbook and Supplemental Materials

- Fletcher, Banister, A History of Architecture on the Comparative Method, 20th. Ed., 1996.
- Giedion, Sigfried, Space, Time and Architecture - The Growth of a New Tradition, Harvard University Press, Massachusetts, 1995

5. Course Information

Catalog Description: Unit 1: Introduction to scientific approach in solving design problems and to design methods. Development of design solutions. Comparison and appraisal. Design principles. Unit 2: Analytical study of architecture different periods to illustrate the architectural expression in each period with its culture and environment. Introduction to theories and philosophy of the international styles of the 20th century and the modern movement.

Prerequisites: ARC-121, History & Theory of Architecture 1.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify the status of design ideas and solve design problems in the current situation
- Identify the architectural trends of the twentieth century and know the philosophy and symbols of each direction
- Defining and applying different theories: organic, functional, structural and expressive theory in the student's project by analyzing the works of the pioneers of the modern movement.
- Describe and design the unique features of Roman, Gothic, and Renaissance architecture to illustrate the architectural expression of each period with its culture, environment, and design consideration.
- Explain of the modern and postmodern architecture movement and an analysis of some of the work of the pioneers through collective research.
- Determining the standards required for design for people with special needs and the technology tools used to help them deal with the void and through collective research.
- Using labs and handcrafts to make the student his design 3D maquette

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

The major topics covered in this course are:

- Introduction
- Studying theories of museums.
- Studying theories and philosophy of the international style of the 20th century.
- Studying Modern architecture movement and analysis some of Pioneer`s works
- Studying post Modern architecture movement and analysis some of Pioneer`s works
- Studying Late Modern architecture movement and analysis some of Pioneer`s works
- Study different approaches: organic theory, functionalism, structuralism and expressionism.

1. Course Number and Name

ARC 131 – Building Construction I

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

El Shahat ,Sherein

4. Textbook and Supplemental Materials

- Ching, F. D. K., Building Construction Illustrated, CBS Publishers & Distributors, India, 2008.
- Chudley, R., & Greeno, R., Building construction handbook, Routledge, 2006.
- Merritt, F. S., & Ricketts, J. T., Building design and construction handbook, McGraw-Hill Education., 2001.
- Allen, E., Fundamentals of Building Construction: Materials and Methods, USA, 3rd. Ed., 1999.
- Davies, C., High technology architecture, Verlag Gerd Hatje, Stuttgart, 1988.
- Reidelbach, J., Modular housing - facts and concepts, Chaners publishing company, 1971.
- Building Construction, Jodi Notowitz, Pearson Education, USA, 2010.
- Operating drawings and architectural details, Muhammad Abdullah, The Anglo-Egyptian Library, Cairo, 2011.
- Barry, R., The construction of buildings, Crosby Lockwood Staples., 1969

5. Course Information

Catalog Description: Study principles of building construction process including its different stages and related technologies.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Discuss stages of building construction including the potential equipment and the common structural systems that could be used in this process.
- Investigate the two common structural systems in buildings (bearing walls and skeleton systems) and apply that knowledge to draw different samples of working plans (including staircases) and potential foundations for a group of buildings.
- Identify & Apply the used materials in process of building construction (i.e. bricks, layers of insulation and flooring) and apply that knowledge to draw different working elevations, sections and details.
- Make sample models for the applied drawings.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction
- Stages of building construction process
- Building construction methods
- Foundation layer
- Staircases & flooring
- Building with brick
- Insulation layers
- Materials & equipment
- Implementation project

1. Course Number and Name

ARC 132 – Building Construction 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

El Shahat ,Sherine

4. Textbook and Supplemental Materials

- Ching, F. D. K., Building Construction Illustrated, CBS Publishers & Distributors, India, 2008.
- Allen, E., Fundamentals of Building Construction: Materials and Methods, USA, 3rd. Ed., 1999.
- Davies, C., High technology architecture, Verlag Gerd Hatje, Stuttgart, 1988.
- Reidelbach, J., Modular housing - facts and concepts, Chaners publishing company, 1971.
- BulidingConstruction, Jodi Notowitz, pearson education, USA, 2010.

5. Course Information

Catalog Description: Study the processes elements of buildings construction: study types of foundation, roof covering methods and expansion and settlement joints, identify the types of timber, finishing works. Course develops student's skills in understanding the basic structural elements of the building as well as finishing Processes.

Prerequisites: ARC 131 – Building Construction 1.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify building foundations types and roof covering methods.
- Apply the types of joints layers (expansion and settlement) and how they be applied in the targeted engineering drawings.
- Apply the types of wood and metal works (i.e., doors and windows).
- Apply engineering drawing (e.g., layout, plans, sections, elevations, joints and openings details) according to multiple considerations.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Studying ways to construct buildings and Buildings systems and load bearing walls and structural buildings.
- Studying Types Of Foundation.
- Expansion and Settlement Joints.
- Roof Covering Methods.
- Identify the Types of Timber and Wood Joinery (doors and windows) Metal Works.

1. Course Number and Name

ARC 151 – Architectural Design 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Mersal, Amira & Ghonemy, Ghehad

4. Textbook and Supplemental Materials

- White, Edward T., A Vocabulary of Architectural Forms, Architectural Media, 1975
- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 1970.
- Paul, Laseau, Graphic Thinking of Architects and Designers, Reinhold Co. NY, USA, 1980.
- "MY HOUSE", SUKAM,IM, PLUGIN, KOREA, 2020

5. Course Information

Catalog Description: The first design studio that deals with simple design problems. It aims at developing student abilities to perceive and design simple spaces and compositions. It concentrates on design considerations and functional requirements based on anthropometric data. The design objectives that are addressed include functional relationship, orientation, privacy and spatial composition.

Prerequisites: ARC-327, Visual Training & Freehand Drawing.

Corequisites: None.**Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Communication and presentation skills in analysing and discussing similar projects to reach the most important design criteria used in the proposed project through collective research.
- Gain of design skills that must be taken into account in the functional and formal requirements of the project, applied its.
- Designing a project that keeps pace with the evolving architectural trends using modern construction techniques.
- Apply the theories and foundations required in solving functional relationships according to the social and cultural conditions of the environment surrounding the building.
- Using labs and handcrafts to Make the student his design 3D maquette.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions

7. List of Topics

The major topics covered in this course are:

- Introduction (residential project)
- Research discussion and presentation
- Sketch design 1 (Concept & Lay Out)
- Project Follow up (3D Model Design)
- Project Follow up (Elevations & Sections)
- Project Follow up (plans)
- development through study model technique)
- Sketch design, model
- Final drawings and presentation of the Project
- Project discussion

1. Course Number and Name

ARC 223– History & Theory of Architecture 3

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Hassan, Hisham & Ghonemy, Ghehad

4. Textbook and Supplemental Materials

- Fletcher, Banister, A History of Architecture on the Comparative Method, 20th. Ed., 1996.
- Ettinghausen, R., Garbar, O., Jenkins, M., Islamic Art and Architecture, New Haven, 2001.
- Public Design 2010, Jeong, Kwang-young, KOREA, Archiworld co.
- PUBLIC SPORTS, 2005, Yang Huan, CHINA, Beijing Hualian
- Architecture Trends 2013 Criss b. mills USA John Wiley
- Designing With Models, 2005, Zaha Hadid, CHINA, Thames & Hudson
- The Complete Zaha Hadid 2009 Richard Penner, CHINA, Richard Penner
- Hotel Design Planning and Development, 2013, Jeong, Kwang-young KOREA, Archiworld
- 2012 Architecture Competition annual (7), 2012, Howard J. Wolff, CHINA THE IMAGES
- 100 Hotels + Resorts 2012, Paco Asensio, NEW YORK, Harper Design
- Offices Design Source 2004, Yukio Ogura, KOREA, Techno staff
- New architecture in Russia, Chen Yueliang, Li & Fung Accor, CHINA, 2006.
- The Elements of Style, Stephen Calloway, Octopus, CHINA, 2012.

5. Course Information

Catalog Description: Review of the architectural movements and trends since the late decades of the 20th. century and Deconstruction Architectures through the analysis of some works of the pioneers of each movement. Discussion of the basic theoretical principles.

Prerequisites: ARC 122– History & Theory of Architecture 2

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Recognize architectural movements and trends since the late decades of the 20th. century.
- Identify and discuss Modernism (Late Modern and Post Modern) to be able to differentiate between each movement through collective research.
- Analysis of projects and the ability to distinguish between the parameters of different architectural directions.
- Study and applying the architectural projects concept, context and the form to design architectural projects.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. List of Topics

The major topics covered in this course are:

- Introduction
- Studying overview of Islamic architecture.
- Studying Islamic architecture from Spain to India
- Analytical Study of art and architecture of successive Islamic periods in Egypt : tulunid and Fatimid periods
- Analytical Study of art and architecture of successive Islamic periods in Egypt : ayyubid and mamluk periods
- Analytical Study of art and architecture of successive Islamic periods in Egypt : ottoman periods
- Examples from religious and secular architecture

1. Course Number and Name

ARC 224– History & Theory of Architecture 4

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Desouki, Mahmoud & Qormod, Abdullah

4. Textbook and Supplemental Materials

- Fletcher, Banister, A History of Architecture on the Comparative Method, 20th. Ed., 1996.
- Ettinghausen, R., Garbar, O., Jenkins, M., Islamic Art and Architecture, New Haven, 2001.
- Public Design 2010, Jeong, Kwang-young, KOREA, Archiworld co.
- PUBLIC SPORTS, 2005, Yang Huan, CHINA, Beijing Hualian
- Architecture Trends 2013 Criss b. mills USA John Wiley
- Designing With Models, 2005, Zaha Hadid, CHINA, Thames & Hudson
- The Complete Zaha Hadid 2009 Richard Penner, CHINA, Richard Penner
- Hotel Design Planning and Development, 2013, Jeong, Kwang-young KOREA, Archiworld
- 2012 Architecture Competition annual (7), 2012, Howard J. Wolff, CHINA THE IMAGES
- 100 Hotels + Resorts 2012, Paco Asensio, New York, Harper Design
- Offices Design Source 2004, Yukio Ogura, KOREA, Techno staff
- New architecture in Russia, Chen Yueliang, Li & Fung Accor, CHINA, 2006.
- The Elements of Style, Stephen Calloway, Octopus, CHINA, 2012.

5. Course Information

Catalog Description: Review of the architectural movements and trends since the late decades of the 20th. century and Deconstructivist Architectures through the analysis of some works of the pioneers of each movement. Discussion of the basic theoretical principles.

Prerequisites: ARC-223-History & Theory of Architecture 3

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Practicing presentation skills.
- Recognize the design philosophy of the Islamic architecture in its context.
- Apply theories of Islamic architecture on group design project.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. List of Topics

The major topics covered in this course are:

- Introduction
- Studying overview of Islamic architecture.
- Studying Islamic architecture from Spain to India
- Analytical Study of art and architecture of successive Islamic periods in Egypt : tulunid and Fatimid periods
- Analytical Study of art and architecture of successive Islamic periods in Egypt : ayyubid and mamluk periods
- Analytical Study of art and architecture of successive Islamic periods in Egypt : ottoman periods
- Examples from religious and secular architecture

1. Course Number and Name

ARC 233 – Building Construction 3

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Desouki, Mahmoud

4. Textbook and Supplemental Materials

- Crosbie, Michael J., Time Saver Standards for Architectural Design Data, McGraw Hill Book Company, New York, 2004.
- Allen, E., Fundamentals of Building Construction: Materials and Methods, USA, 3rd. Ed., 1999.
- A & C DETAIL, A & C Detail Roof 2 Series 7, A & C DETAIL, CHINA, 2009.

5. Course Information

Catalog Description: Study Building finishes of modern systems using mechanical installations process for finishing different parts of the building: Study of types of metal structures and cladding materials, ceilings, floors and finishes the work of internal and external systems.

Prerequisites: ARC 132, Building Construction 2

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply creating & reading technical workshop drawings
- Identify different materials pros & cons, and gain the ability to choose the material or the system wisely.
- Applying the gained knowledge to make a full working drawing project.
- Apply research and presentation skills through team work group.
- Using labs and handcrafts to Make detailed 3D maquette.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. An ability to develop and conduct appropriate experimentation, analyses and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Studying types of Metal structures.
- External finishing and outdoor Cladding system.
- Curtain wall and Skylights.
- Internal finishing and indoor cladding system.
- Studying types of raw materials and equipment used in finishing by mechanical methods.

1. Course Number and Name

ARC 241 – Environmental Control

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Hassan, Hisham

4. Textbook and Supplemental Materials

- Brown, G.Z., Sun, Wind and Light, Architectural Design Strategies, John Wiley & sons Inc, 2000.
- Koenigsberger, O.H., Igersoll, T.G., Mayhew. A., Szokolay, S.V., Manual of Tropical Housing and Building, Longman, 1974.

5. Course Information

Catalog Description: Introduction to the concept of environmental control. The effect of climatic regions on building design. Study of the requirements of thermal and visual comfort. Study of building thermal performance and its methods.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Using thermal and optical measurement devices on a building and learning how to monitor averages and compare them with measurement rates according to ASHREE code.
- Gain of knowledge to enhance the influence of climatic zones on the design of buildings, the requirements for thermal comfort and visual comfort.
- Apply thermal performance and control methods by understanding heat exchange between buildings and the environment.
- Evaluating the thermal performance of buildings and methods of controlling it through various treatments.
- Recognize qualitative and quantitative components of daylighting performance.
- Discussing the impact of building design on daylighting performance, methods of daylighting analysis, and daylighting systems and techniques using computer programs.
- Explain and methods of calculating thermal and visual comfort according to ASHRAE code and energy saving code.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction to the concept of environmental control.
- The effects of climate regions on building design.
- The requirements of thermal comfort and visual comfort.
- Building thermal performance and the thermal exchange between building and the environment.
- Importance of day lighting performance. Influence of building design on daylight performance.
- Methods of analyzing day lighting. Day lighting system and techniques.
- The science of Sun path and latitude degrees.

1. Course Number and Name

ARC 242 – Acoustics & Illumination.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Faroun, Nora. & Eid, Mohamed

4. Textbook and Supplemental Materials

- Egan, M. David, Architectural Acoustics, McGraw Hill Book Company, 1988.

5. Course Information

Catalog Description: Definition of architectural acoustics and its importance in buildings, concepts and terminologies, behavior of sound waves in enclosures, sound absorption, sound reflections, sound isolation, the acoustical defects, the concepts and objectives of the successful acoustics design. Artificial Illumination: Physics of light, terminology and definitions. Luminance measurements, light sources, designing for artificial lighting quantity and quality, integration with day lighting.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify Physics of light, terminology, the artificial lighting quantity and quality, integration with day lighting.
- Design illumination scheme Calculating the required illumination, total number of lamps using Trigonometric functions and Inverse Square Law.
- Outline architectural acoustics scheme and its importance in buildings, concepts and terminologies, behavior of sound waves in enclosures, sound absorption, sound reflections, sound isolation, the acoustical defects, the concepts and objectives of the successful acoustics design.
- Calculate total sound pressure level resulting from the free acoustic field (SPL), efficiency of Sounds Isolation Schemes (NRC) and transmission loss (TL) using Logarithmic Functions.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

7. List of Topics

The major topics covered in this course are:

- Introduction to artificial illumination.
- Artificial Illumination: physics of light, terminology and definitions.
- Luminance measurement, light sources, designing for artificial lighting quality.
- Introduction to architecture acoustics and terminologies, behavior of sound waves.
- Architecture Acoustics: sound (absorption, reflection).
- The acoustical defects, the concepts and objectives of successful acoustics design.

1. Course Number and Name

ARC 252 – Architectural Design 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Hassan, Hisham.

4. Textbook and Supplemental Materials

- EVOLVING DESIGN 2, 2011, BRUCE FOWLE, AUSTRALIA, THE IMAGES
- FOX & FOWLE ARCHITECTS, 2005, ROGER YEE, NEW YORK, VISUAL REFERENCE
- EDUCATIONAL ENVIRONMENTS, 2007, LIU MIN, KOREA, TANG ART
- MUSEUM AND ART SPACES, YANG HUAN, BEIJING HUALIAN, CHINA, 2001.

5. Course Information

Catalog Description: The design studio aims at developing the student's architectural design skills. It deals with small projects that contain repetitive elements. The student is asked to study the functional relationship between the design elements and their relationship within the site layout and the surrounding environment. Examples of projects: Nursery, elementary school, small commercial center, tourist village.

Prerequisites: ARC 151, Architectural Design 1

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required .

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify design standards, architectural trends and building techniques used in educational buildings
- Gain communication and presentation skills in analyzing and discussing similar projects to reach the most important design standards used in educational buildings.
- Designing educational buildings, taking into account the functional and formal requirements of the project.
- Designing a project that keeps pace with the evolving architectural trends using modern construction techniques.
- Apply the theories and foundations required in solving functional relationships according to the environmental conditions surrounding the building.
- Using labs and handcrafts to Make the student his design 3D maquette.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Matrix & Zoning & Bubble Diagram
- Concept & Making plans & Layout
- Elevations
- Sections
- Finishing & Studies

1. Course Number and Name

ARC 253 – Architectural Design 3

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Hassan, Hisham & Ghonemy, Ghehad.

4. Textbook and Supplemental Materials

- Fairweather, Leslie & Silwa, Jan A., AJ Metric Handbook, The Architectural Press Ltd., London, 2008.
- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Zelnic, Architectural Graphic Standards for Housing & Residential Development, Mc Graw Hill, USA, 1994.
- Cinema Architecture, 2009, THE IMAGES, CHINA, THE IMAGES
- Museum and Art spaces, 2001, Thames & Hudson, Germany, Gruppo Editoriale Fabbri-Bompiani
- Candida Hofer Libraries, 1983, THE IMAGES, CHINA, THE IMAGES

5. Course Information

Catalog Description: The design studio aims at developing the student's architectural design capacities. The student is exposed to medium size projects that have multi functions and more complex relationships. Focus is given to the circulation issues and the structural concepts. Examples of projects: Residential complex, small hotel, office buildings.

Prerequisites: ARC-252, Architectural Design 2

Corequisites: None .**Pre or Corequisites:** None.

Type of Course: Required .

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify design standards, architectural trends and building techniques used in project through collective research
- Gain communication and presentation skills in analysing and discussing similar projects to reach the most important design standards used in educational buildings.
- Designing Project, taking into account the functional and formal requirements of the project
- Designing a project that keeps pace with the evolving architectural trends using modern construction techniques.
- Apply the theories and foundations required in solving functional relationships according to the environmental conditions surrounding the building.
- Using labs and handcrafts to Make the student his design 3D maquette.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions

7. List of Topics

The major topics covered in this course are:

- Introduction (Cultural center).
- Matrix & Zoning & Bubble Diagram
- Concept & Making plans & Layout
- Elevations
- Sections
- Finishing & Studies.

1. Course Number and Name

ARC 261 – Landscape and Urban Design

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

El Shahat ,Sherein

4. Textbook and Supplemental Materials

- Dee, C., Form and fabric in landscape architecture: a visual introduction. Taylor & Francis, 2004.
- Motloch, J. L., Introduction to landscape design. John Wiley & Sons., 2000.
- Liversedge, J., & Holden, R., Landscape architecture: an introduction, Hachette UK., 2014.
- Murphy, M., Landscape architecture theory. Island Press, 2016.
- Booth, Norman K., Basic Elements of Landscape Architectural Design, Ohio State University, 1999.
- Carmona, M. Heath, T. & Tiesdell, S., Public Places Urban space: the Dimensions of the Urban Design, Oxford, Architectural Press, 2nd. Ed., 2010.
- Cullen, G., The Concise Townspace, London, Butterworth Architecture, 1995.
- Laurie, Michael, Introduction to Landscape Architecture, Prentice Hall, 1986.
- Lynch, K., The Image of the City, Cambridge, Massachusetts, MIT Press, 1960.
- Moughtin, Cliff, Urban Design: Street and Square, Oxford, Architectural Press, 3rd. Ed., 2003.
- Moughtin, Cliff, Oc, Taner, Tiesdell, Steven, Urban Design: Ornament and Decoration, Oxford, Butterworth Architecture, 1995.
- Simonds, J.O., Landscape Architecture, A Manual of Land Planning and Design, 2006.

5. Course Information

Catalog Description: Study the use of landscape elements and urban space elements in process of urban design based on their function and form and through applying on the targeted layouts.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply characteristics of hardscape and softscape elements in landscape architecture and their relation with urban elements, and how to be applied in design of the targeted project.
- Apply use of landforms, plant materials, water, site structures and pavements in landscape design and how to be applied in design of targeted project.
- Apply elements, dimensions, types and forms of urban space and how to be applied in design of different types of urban spaces.
- Explain landscape elements and urban space characteristics through making a discussion by each group of students.
- Explain the most common theories that used in urban design (i.e. theory of image of city and serial vision).
- Apply the different standards and theories in the targeted layouts according to their impact on visual and functional aspects of environment.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction
- Elements of hardscape and softscape in landscape architecture
- Use of landforms and plants in landscape design
- Use of water, pavement and site structures in landscape design
- Introduction to urban design.
- The dimensions of urban design,
- Elements of urban space.
- Qualities, types and forms of urban space,
- Feelings in an urban space.
- Theory of perception and serial vision.
- Mental image and its components

1. Course Number and Name

ARC 262 – History & Theory of Planning

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28)

3. Course Coordinator

El Shahat ,Sherein

4. Textbook and Supplemental Materials

- Vitruvius (1914). The Ten Books on Architecture, Bk I. Morris H. Morgan (translator). Harvard University Press.
- Leonardo Benevolo, The English edition of Die Geschichte der Stadt: The History of the city, 1980.
- McConnell, Shean. Theories for Planning, 1981, David & Charles, London.
- Hall, Peter (17 April 2014). Cities of Tomorrow: An Intellectual History of Urban Planning and Design Since 1880. John Wiley & Sons.
- Taylor, Nigel (11 June 1998). Urban Planning Theory since 1945. SAGE.
- Etzioni, A. (1968). The active society: a theory of societal and political processes. New York: Free Press.
- Girouard, Mark, Cities and People, 1985, London, p. 285.
- John Friedman, "Varieties of Planning Experience: Toward a Globalized Planning Culture?"; in Weber & Cran, 2012.

5. Course Information

Catalog Description: Study the historical background and basic theories of planning through identifying of city planning in different eras and applying on small - scale contemporary plans.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify and explain the dominated factors that impacting in settlements planning (city/village) in different times; Pre - historic times, Ancient civilizations, Middle Ages, Islamic State, Renaissance and Baroque Ages
- Identify and Outlines the modern theories of planning in establishing cities.
- Explain the different civilizations and theories through making a discussion by each group of students.
- Assess the issues of urban residential site or small towns to conclude upgrade planning.

This course supports student outcomes by developing:

1. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction
- The city in the pre- Historic times (ancient Egyptian, Mesopotamia, ancient Greek, ancient Roman).
- The city in the in Middle Ages and Islamic State
- The city in Renaissance and Baroque
- The modern theories of planning in establishing cities
- Comprehensive planning studies.
- Implementation project

1. Course Number and Name

ARC 327 – Architectural Criticism & Projects Evaluation

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Desoki ,Mahmoud

4. Textbook and Supplemental Materials

- Aldo Rosse, Architecture, Architecture, Theory and Criticism, Boston Mass, MIT Press, 1989.

5. Course Information

Catalog Description: Using architectural criticism as a tool for producing new ideas or creating products. The importance of re - reading of an architectural end - product for a better comprehension and evaluation will be emphasized. Principles of architectural criticism and techniques of evaluating projects are discussed.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Practicing presentation skills
- Practicing architectural criticism.
- Explain how to present & defend ideas
- Produce project concepts.
- Practice project criticizing & evaluation
- Explain theoretical background

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. List of Topics

The major topics covered in this course are:

- Availability of natural resources, Natural cycles for some basic elements. Conflicts between developments, Economics and environments.
- Defining emissions sources, Impacts, Standards and precautions. Water, Air and soil pollution and measurements.
- Procedures of the environmental impact assessment: Screening, Scoping, defining impacts, comparing alternatives, Plans for mitigation and alleviation, Environmental auditing. & Public participation.
- Environmental impact statement and reporting, Contents and forms.
- Examples for assessing the impacts of water resources projects on the environment and impacts of different activities on the water environment.

1. Course Number and Name

ARC 331 – Working Drawings 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Gaffar, Ashraf.

4. Textbook and Supplemental Materials

- Callander, John H., and De Chiara J., Time Saver Standards for Architectural Data, McGraw Hill Book Company, New York, 1974.
- Ching, F. D. K., Building Construction Illustrated, CBS Publishers & Distributors, India, 2008.
- Allen, E., Fundamentals of Building Construction: Materials and Methods, USA, 3rd. Ed., 1999.
- Detail in Contemporary Residential Architecture, Hamish Muir, Laurence King , CHINA, 2012.
- Operating drawings and architectural details, Muhammad Abdullah, The Anglo-Egyptian Library, Cairo, 2011.

5. Course Information

Catalog Description: Introduction to the specialized sets of drawings. Detailed plans, elevation and sections. Data, dimensions, levels. Finishing tables. Opening tables. Architectural detailing. Coordination between specialized drawings.

Prerequisites: ARC 233 – Building Construction 3.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify the different types of architectural drawings and interpret the information contained in each.
- Identify the different types of architectural symbols used in building drawings and their proper use
- Identify the types of finishing materials and the appropriate use of them in the project.
- Acquire the necessary drafting skills to prepare architectural working drawings including site plans, floor plans, foundation plans, elevation, details and sections.
- Apply architectural working drawings correctly, demonstrating proficiency in the use of drafting equipment.
- Apply different insulation layers in the architectural works drawings correctly, (Sound, thermal and waterproof insulation).

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction & Project Drawings.
- X-ref drawings for the project.
- Discuss the structure system for the project.
- Executive plans for the project.
- Executive elevations & sections for the project.
- Executive details & Finishing.

1. Course Number and Name

ARC 332 – Working Drawings 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Gaffar, Ashraf.

4. Textbook and Supplemental Materials

- Ching, F. D. K., Building Construction Illustrated, CBS Publishers & Distributors, India, 2008.
- 2013 ANNUAL INTERIOR DETAIL 14,2011 Jung Heung Chae, CHINA A & C DETAIL
- Architecture Graphic Standards, 2012, John Ray Hoke, USA, John Wiley
- Architectural Drawing, 2012, John Round, CHINA, Laurence King

5. Course Information

Catalog Description: Studio work aims at learning detailed plans, elevation and sections. Finishing tables. Opening tables. Producing a whole set of detailing including electrical and plumbing drawings.

Prerequisites: ARC 331, Working Drawings 1

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify creating, & reading technical working drawings.
- Identify different materials & systems pros & cons, and gain the ability to Sanitary Installations, electrical, fire systems, air conditioning systems.
- Applying the gained knowledge to make a full working drawings project.
- Acquire the necessary drafting skills to prepare architectural working drawings including site plans, floor plans, foundation plans, elevation, details and sections.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction & Project Drawings
- X-ref drawings for the project
- Discuss the structure system for the project
- Executive plans for the project
- Executive elevations & sections for the project
- Executive details & Finishing

1. Course Number and Name

ARC 336– Maintenance of Buildings

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Qormod, Abdullah

4. Textbook and Supplemental Materials

- Smith P & Julian W, Building services, Applied science publications

5. Course Information

Catalog Description: Durability of buildings: Life expectancy of different types of buildings, effect of environmental elements such as heat, dampness and precipitation on buildings, effect of chemical agents on building materials, effect of pollution on buildings, effect of fire on building, damage by biological agents like algae, fungus, moss, insects. Maintenance of buildings: Reliability principles and its applications in selection of systems for routine maintenance of building, maintenance cost, specifications for maintenance works. Conservation and recycling: Performance of construction materials and components, rehabilitation of constructed facilities, materials and methods for conservation work, recycling of old buildings and its advantages.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Explain how to address the impact of environmental factors such as heat, humidity and precipitation on buildings
- Identify ways to maintain buildings from the impact of chemical and biological factors such as algae, fungi and mold.
- Apply different theories: organic, functional, structural and expressive theory in the student's project by analyzing the works of the pioneers of the modern movement.
- Define different ways to rehabilitate constructed facilities using materials and methods required for conservation work
- Categorize the work of intervention in buildings for the purpose of maintenance.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Control systems.
- Analysis Life expectancy of different types of buildings.
- Sampling and Inspection.
- Conservation and recycling: Performance of construction materials and components.
- Rehabilitation of constructed facilities, materials and methods for conservation work .
- Analyzing Process Capability. , recycling of old buildings and its advantages.

1. Course Number and Name

ARC 354 – Architectural Design 4

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) /FALL

3. Course Coordinator

Hassan, Hisham

4. Textbook and Supplemental Materials

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Time saver standards for architectural design, 2011, Donald Watson, New York, McGraw-Hill
- The Grove Encyclopedia of American Art, 2011, Oxford University Press, UK, England.
- B. Hillier, Space is the Machine: a Configurational Theory of Architecture, Cambridge University Press, Cambridge, UK, 1996.
- Daniel Schulz, Planning & Design: Shopping Centers, Design Media Publishing Limited, 2014.
- Peter Coleman, Shopping Environments, Routledge, UK, England 2006.
- Carles Broto, New Shopping Malls, Links International, UK, England 2007.

5. Course Information

Catalog Description: The design studio aims at developing the student's architectural design skills. It deals with small projects that contain repetitive elements. The student is asked to study the functional relationship between the design elements and their relationship within the site layout and the surrounding environment. Examples of projects: Nursery, elementary school, small commercial center, tourist village.

Prerequisites: ARC 253, Architectural Design 3

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify design standards, architectural trends and building techniques used in multifunctional buildings through collective research.
- Gain of communication and presentation skills in analyzing and discussing similar projects to reach the most important design standards used in Sports buildings.
- Designing multifunctional buildings, taking into account the functional and formal requirements and the elements of vertical and horizontal communication within the project.
- Designing a project that keeps pace with the advanced architectural trends using modern construction techniques and methods.
- Apply the theories and foundations required in solving functional relationships according to the environmental conditions surrounding the building.
- Using simulation labs and handcrafts to Make the student his design 3D model.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. An ability to develop and conduct appropriate experimentation, analyses and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Matrix & Zoning & Bubble Diagram
- Concept & Making plans & Layout
- Elevations
- Sections
- Finishing & Studies

1. Course Number and Name

ARC 355 – Architectural Design 5

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Abdo, Heba & Hassan, Hisham.

4. Textbook and Supplemental Materials

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Time saver standards for architectural design, 2011, Donald Watson, New York, McGraw-Hill
- The Grove Encyclopedia of American Art, 2011, Oxford University Press, UK, England.
- B. Hillier, Space is the Machine: a Configurational Theory of Architecture, Cambridge University Press, Cambridge, UK, 1996.
- Daniel Schulz, Planning & Design: Shopping Centers, Design Media Publishing Limited, 2014.
- Peter Coleman, Shopping Environments, Routledge, UK, England 2006.
- Carles Broto, New Shopping Malls, Links International, UK, England 2007.

5. Course Information

Catalog Description: The design studio aims at developing the student's architectural design skills. It deals with small projects that contain repetitive elements. The student is asked to study the functional relationship between the design elements and their relationship within the site layout and the surrounding environment. Examples of projects: Nursery, elementary school, small commercial center, tourist village.

Prerequisites: ARC-354, Architectural Design 4

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify design standards, architectural trends and building techniques used in multifunctional buildings through collective research.
- Acquisition of communication and presentation skills in analysing and discussing similar projects to reach the most important design standards used in Healthcare buildings.
- Designing multifunctional buildings, taking into account the functional and formal requirements and the elements of vertical and horizontal communication within the project.
- Designing a project that keeps pace with the advanced architectural trends using modern construction techniques and methods.
- Apply the theories and foundations required in solving functional relationships according to the environmental conditions surrounding the building.
- Apply design and structure by simulation programs in the project.
- Using labs and handcrafts to make the student his design 3D maquette

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Matrix & Zoning & Bubble Diagram
- Concept & Making plans & Layout
- Elevations
- Sections
- Finishing & Studies

1. Course Number and Name

ARC 371- Architectural & Urban Legislations

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28)

3. Course Coordinator

Desouki, Mahmoud

4. Textbook and Supplemental Materials

- قانون البناء رقم 008 لسنة 0119 ولائحته التنفيذية الصادرة بقرار وزير الإسكان والمرافق والتنمية العمرانية رقم 144 لسنة 2009.
- جمال الدين نصار & محمد ماجد خلوصي، قانون وتشريعات وعقود الاتحاد الدولي للمهندسين الاستشاريين (فيديك). 1998.

5. Course Information

Catalog Description: The role of each of the architect, the contractor, and the owner during the building and construction process. Study of the professional practice codes and legislations in terms of rights, commitments, ethics and scope of services. Study of types of contracts, fees, bidding, and construction supervision. Discussion and analysis of types of contracting agreements and guarantee against construction flaws. Case studies. Discussion of building codes and examples.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Demonstrate the context of the relationship between the engineer, contractor, and the owner.
- Act in different situations, when exchanging roles or conflict of interest happens.
- Identify the Egyptian building legislations and apply them to produce residential project.
- Differentiate between different types of contracts and choose the suitable contract type.

This course supports student outcomes by developing:

1. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Introduction
- Executive regulations for building law (briefs).
- Building components briefs.
- General regulations.
- FIDIC contracts (briefs)
- The employer Duties.
- The engineer duties & authorities.
- Performance security, sitting out, safety procedures, and site data.
- Environment protection.

1. Course Number and Name

ARC 411 -Computer Applications in Architecture

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42)

3. Course Coordinator

Hassan, Hisham.

4. Textbook and Supplemental Materials

- Microsoft Excel Manual: Arrays, Functions and Macro, Microsoft Corporation.
- Selected Software, Drafting Packages, CAD Tools, Latest Ed,
- Vince, John et. Al., Advances in Modeling, Animation & Rendering, Springer, 2002.
- Zellner, P., Hybrid Space, New Forms in Digital Architecture, Thames & Hudson, Lodon, 2000.

5. Course Information

Catalog Description: Computer as decision support tool. Mathematical modeling through using the spreadsheet programs. Topics include: Basic principles, Entering data, Editing and formatting, Data processing, Functions and formulae, Navigation worksheets and workbooks, Creating hyperlinks, Applying protection and adding comments. Cad virtual building modeling through the use of 3D programs. Basic concepts and tools for creating an object-oriented 3D virtual model. A variety of ArchiCAD output capabilities such as plotting drawings, quantity calculations, rendering, sun studies, virtual reality and panoramic scenes.

Prerequisites: None.

Corequisites:None.**Pre or Corequisites:**None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply basic concepts and tools to create 3D virtual model, helping students to create their own Digital Models in Design Project.
- Produce professional technical AutoCAD drawings.
- Engage the Rendering settings to produce panoramic and realistic scenes on 3dsMAX.
- Identify the user interface for some architecture programs like, AutoCAD, 3dsMAX, and Autodesk Revit, analyzing the difference between them.
- Explain some amateur and professional commands in AutoCAD and 3dsMax to enable students making their own project models.

This course supports student outcomes by developing:

1. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
2. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction to Autocad
- Knowing general and explaining how to draw a plan on the Autocad
- Drawing Plane complete with all the architectural details
- Drawing Architectural dimensions
- Introduction to 3D Max
- How to do Modeling in 3D Max
- Modeling to project of Architecture Design 3
- Learning Materials

1. Course Number and Name

ARC 457 – Interior Design

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) /FALL

3. Course Coordinator

Thabet, Ahmed

4. Textbook and Supplemental Materials

- the elements of style 2012 dennis CHINA Octopus
- Interior World (Design & Detail) 2015 JEONG KWANG KOREA Archworld Co.
- New Classicists Richard Manior Architecture 2011 Stukin, Stacie CHINA The images
- Time saver standards for Interior Design and Planning 1991, Julius Panero and Martin Zelnik

5. Course Information

Catalog Description: Study of theories and principles of interior design, Internal and external spaces hierarchy and interaction, Study of horizontal and vertical planes treatments and finishes, Study of movement, Visual perception, Space time internally and externally, Study of surfaces: Textures, Forms, and visual illusions, Theories of color, Color schemes and its different effects, The effects of natural and artificial lighting on interior spaces.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Study the theories and foundations of interior architecture design
- Gain the skills of designing internal and external spaces, gradation and interaction together, applied its.
- Design different treatments for horizontal and vertical determinants and studying movement and visual and temporal sequences in internal and external spaces.
- Ability to form and optical illusion using surfaces in terms of texture
- Study the theories of colors and color groups and their various effects, and apply them in the project, natural and artificial lighting according to its effect on interior spaces and surfaces.
- Analysis and presentation of samples of some of the works and global trends in interior design, by using simulation and possible virtual reality techniques.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Study of theories and principles of interior design
- Internal and external spaces hierarchy and interaction
- Space time internally and externally, Study of surfaces: Textures, Forms, and visual illusions, Theories of color, Color schemes and its different effects
- The effects of natural and artificial lighting on interior spaces
- International examples and concepts in interior design.
- Design of artificial and natural Lighting

1. Course Number and Name

ARC 458 – Sustainable Architecture

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Hassan, Hisham & Attya, Mahmoud.

4. Textbook and Supplemental Materials

- Power Brown Architecture 2007 Melina Deliyannis CHINA images
- Design Innovation For The Built Environment 2012 Michael U. Hensel Britain TJ International.

5. Course Information

Catalog Description: The course examines the environmental impact of building design and construction. The concept of sustainable architecture is discussed as a means of reducing this impact. Understanding the principles of Sustainable architecture that seeks to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in the use of materials and energy. Applications of the techniques of ecologically conscious approach in the field of architecture.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Discuss and apply the concept of sustainable architecture as a means of reducing the environmental impact of building design and construction.
- Apply the principles of Sustainable architecture in any kind of projects.
- Define how to minimize the negative environmental impact of buildings by enhancing efficiency and moderation in the use of materials and energy.
- Apply the techniques of the ecological conscious approach in the architectural designs.

This course supports student outcomes by developing:

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- The course examines the environmental impact of building design and construction
- The concept of sustainable architecture is discussed as a means of reducing this impact.
- Understanding the principles of Sustainable architecture that seeks to minimize the negative environmental impact of buildings
- Efficiency and moderation in the use of materials and energy.
- Applications of the techniques of ecologically conscious approach in the field of architecture.

1. Course Number and Name

ARC 463 – Housing

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

El Shahat ,Sherein

4. Textbook and Supplemental Materials

- Angel, Shlomo. Housing policy matters: A global analysis. Oxford University Press, 2000.
- Davidson F. And Geoffrey Payne, Urban Projects Manual, A guide to preparing upgrading and new development projects accessible to low -income groups, Liverpool University Press, 2000
- World Bank, Housing, enabling Markets to work, with technical supplement, a World Bank Policy Paper, The World Ban, Washington D.C., 1993.
- Alsayed, Aymen, Land Management for New Low Cost Housing Construction, A Systematic Approach and a Proposed Evaluation Methodology Applied to Egypt Case, A PhD thesis, Faculty of Architecture, Warsaw University of Technology, 2004

5. Course Information

Catalog Description: Study principles of housing types and its aims and tools including its different problems and related policies (in Egypt and in a forging country).

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Discuss and identify the housing concepts, housing types and axes of new housing areas to be used in the followed projects.
- Calculate different issues to reach to targeted net density (with ideal net work and services).
- Identify indicators and impacting factors of housing in light of aims and tools of housing and how they be used to apply on a targeted neighborhood project.
- Create models for the applied project by using simulation.
- Assess housing problem and policies in Egypt compared to housing problem and policies in foreign country to implement the assessment in an analytical field study on housing sector in Egypt.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
4. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction
- Housing concepts
- Housing problems and the relation between phenomenon and reasons
- Housing indicators
- Principles of housing development
- Housing demand and Supply
- Setting Housing development aims and tools
- Characteristics and impacting factors of housing development system
- Housing Problem in Egypt
- Housing indicators, problems and policies in a foreign country

1. Course Number and Name

ARC 472 – Execution Documents

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Desouki, Mahmoud

4. Textbook and Supplemental Materials

- Cartlidge, D. (2017). Quantity surveyor's pocket book. Taylor & Francis.
- Seeley, I. H., & Winfield, R. (1999). Building quantities explained. Macmillan International Higher Education.
- Glenn E. Wiggins, A Manual of Construction Documentation 1st Edition, Watson-Guptill, 2020.

5. Course Information

Catalog Description: Elements of contract documents. Writing of specifications documents that complement the working drawings. General and special conditions of the job. Defining the scope of work and detailed description of items and materials. Quality surveyor; rules and methods. The techniques of calculating the quantities of building items. Check listing the finished work and detecting faulty items.

Prerequisites: ARC-332, Working Drawings2.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply measurement & calculating a project tender BOQ
- Recognize the technical engineer role.
- Practice Methods of measurement and calculating building items.
- Display assurance methods.
- Identify the different types of measurement and calculation for building items and finishing materials.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction
- Elements of contract documents.
- Writing of specifications documents that complement the working drawings.
- General and special conditions of the job.
- Defining the scope of work and detailed description of items and materials.
- Quality surveyor; rules and methods.
- The mathematical method of calculating the volumes of shapes
- The techniques of calculating the quantities of building items.
- Check listing the finished work and detecting faulty items.

1. Course Number and Name

ARC 491 – Project 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / FALL

3. Course Coordinator

Gaffar, Ashraf.

Ghonemy, Ghehad.

Desouki, Mahmoud

El Shahat ,Sherein

Hassan, Hisham

4. Textbook and Supplemental Materials

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Watson, Donald, Time Saver Standards for Urban Design, McGraw Hill Book Co., USA, 2003.
- Ramesh Gulati & Ricky Smith, Maintenance and Reliability Best Practices, Industrial Press, Inc., 1st. Ed., 2009.

5. Course Information

Catalog Description: Analysis of collected data regarding the proposed site. Analysis and discussion of similar projects and preparing a technical report concerning the environmental analysis of the site, comparative study with similar projects. The final report leads to the final architectural program of the project.

Prerequisites: ARC-355, Architectural Design 5

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Develop communication and presentation skills in analyzing and discussing similar projects to reach the most important design criteria used in the proposed project.
- Identify design standards, architectural trends and building techniques used in project
- Identify the theories and foundations required in solving functional relationships according to the environmental conditions surrounding the building through a collective research
- Analyze Similar projects the project land and making a collective report with climatic, cultural and social studies.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

7. List of Topics

The major topics covered in this course are:

- Introduction about how to create a graduation project.
- Issue statement, Project Concept & SWOT analysis.
- Site Selection & Analysis of collected data regarding the proposed site.
- Analysis and discussion of similar projects
- Preparing a technical report concerning the environmental and futuristic analysis of the site and the project.
- comparative study with similar projects
- The Project Program
- Design Theories of the Project
- The Concept of the Design
- The final report leads to the final architectural program of the project.

1. Course Number and Name

ARC 492 – Project 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / SPRING

3. Course Coordinator

Gaffar, Ashraf.

Ghonemy, Ghehad.

Desouki, Mahmoud

Hassan, Hisham

Faroun, Nora.

4. Textbook and Supplemental Materials

- Neufert, E., Architect's Data, Crosby Lockwood Staples, London, 2000.
- Watson, Donald, Time Saver Standards for Urban Design, McGraw Hill Book Co., USA, 2003.
- Ramesh Gulati & Ricky Smith, Maintenance and Reliability Best Practices, Industrial Press, Inc., 1st. Ed., 2009.

5. Course Information

Catalog Description: Analysis of collected data regarding the proposed site. Analysis and discussion of similar projects and preparing a technical report concerning the environmental analysis of the site, comparative study with similar projects. The final report leads to the final architectural program of the project.

Prerequisites: ARC-491, Project 1

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify design standards, architectural trends and building techniques used in multifunctional buildings.
- Acquisition of communication and presentation skills in discussing project.
- Designing multifunctional buildings, taking into account the functional and formal requirements and the elements of vertical and horizontal communication within the project.
- Designing a project that keeps pace with the advanced architectural trends using modern construction techniques and methods.
- Apply the theories and foundations required in solving functional relationships according to the environmental conditions surrounding the building.
- Apply the theories and foundations required in solving functional relationships according to the social and cultural conditions of the environment surrounding the building.
- Apply environmental design and construction simulation programs in the project and statistics programs to make an inventory of quantities and specifications of building materials.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

7. List of Topics

The major topics covered in this course are:

- Introduction about how to create a graduation project.
- Issue statement, Project Concept & SWOT analysis.
- Site Selection & Analysis of collected data regarding the proposed site.
- Analysis and discussion of similar projects
- Preparing a technical report concerning the environmental and futuristic analysis of the site and the project.
- comparative study with similar projects
- The Project Program
- Design Theories of the Project
- The Concept of the Design
- The final report leads to the final architectural program of the project.

1. Course Number and Name

291 – Field Training 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (4) / SUMMER

3. Course Coordinator

Many, Doctor.

4. Textbook and Supplemental Materials

- Handouts and World Wide Web.

5. Course Information

Catalog Description: The purpose of this course is to help students to work successfully in the outside community and work environment, also this course introduces description of practical Architectural engineering problems, solution for real engineering problems, data interpretation and utilization, adaptation to write technical report.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Describe practical Architectural engineering problems
- Reproduce solution for real architectural engineering problem
- Analyse and Interpret data, and use engineering judgment to draw conclusions
- Use project management techniques to architectural systems.
- Use project management techniques to work as team in site project.
- Show the ability to work independently as a part of a team
- Demonstrate the ability to recognize ethical and professional responsibilities of architect.
- Operate effectively with a range of audiences

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- The major topics covered in this course are various in the field of electronics and communication engineering.

9. Grades Distribution

Assessment	Grade %
Field Supervisor Evaluation	25%
Academic Supervisor Evaluation	5%
Technical Report	25%
Oral Presentation	30%
Performed Task(s)	15%

1. Course Number and Name

391 – Field Training 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (4) / SUMMER

3. Course Coordinator

Many, Doctor.

4. Textbook and Supplemental Materials

- Handouts and World Wide Web.

5. Course Information

Catalog Description: The purpose of this course is to help students to work successfully in the outside community and work environment, also this course introduces description of practical communication and electronics engineering problems, solution for real engineering problems, data interpretation and utilization, adaptation to write technical report.

Prerequisites: 291 – Field Training 1.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Describe practical Architectural engineering problems
- Reproduce solution for real architectural engineering problem
- Analyse and Interpret data, and use engineering judgment to draw conclusions
- Use project management techniques to architectural systems.
- Use project management techniques to work as team in site project.
- Show the ability to work independently as a part of a team
- Demonstrate the ability to recognize ethical and professional responsibilities of architect.
- Operate effectively with a range of audiences

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- The major topics covered in this course are various in the field of electronics and communication engineering.

9. Grades Distribution

Assessment	Grade %
Field Supervisor Evaluation	25%
Academic Supervisor Evaluation	5%
Technical Report	25%
Oral Presentation	30%
Performed Task(s)	15%

1. Course Number and Name

CIS 112– Structural Analysis 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Abdelaziz, Mahmoud

4. Textbook and Supplemental Materials

- Beer F. P., Johnston E. R., Dewolf J. T. and Mazurek D. F, Mechanics of Materials, McGraw Hill Ltd, 2009.

5. Course Information

Catalog Description: Study types of loads, types of supports, reactions, and Stability of Statistically determinate structures, internal forces in statically determinate plane beams, Frames and trusses.

Prerequisites: None **Corequisites:** None **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply the knowledge of mathematics in structural Analysis problems and analyze and solve various types of structures.
- Recognize the types of loads and supports and how to calculate the reaction of plane structures such as (beams, frames, trusses, and arches).
- Recognize how to calculate the internal forces in the beams, frames, trusses, and arches.
- Recognize the different types of structures and its components.
- Analyze the effect of moving loads on Beams, Frames and Trusses.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7. List of Topics

The major topics covered in this course are:

- Reaction of Plane Structures.
- Internal Forces in Beams Structures.
- Rigid Frames Analysis & Truss Analysis

1. Course Number and Name

CIS 141– Behaviour of Materials

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Ibrahim, Hany

4. Textbook and Supplemental Materials

- Materials for civil and construction engineers, Mamlouk, M and Zaniewski, J, Prentice Hall, 3rd Ed., 2006.
- EKB (Egyptian Knowledge Bank)

5. Course Information

Catalog Description: Study the nature and performance of civil engineering materials and evaluation of their physical and mechanical properties, Testing machines and its calibration, computing different type of stresses applied on different types of material. Also, how to improve the properties of these materials.

Prerequisites: None. **Corequisites:** None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Describe and evaluate the main properties and applications of construction materials (cement – fine aggregate- coarse aggregate)
- Describe and evaluate the mechanical behavior of metals under tension, compression, and flexure.
- Demonstrate construction building materials to perform a specific function through glass group work
- Test and measure the main properties of cement, aggregate, metals according to standards as well as assess the mechanical behavior of metals under tension, compression, and flexure.
- Analyze a set of data in order to deduce the various properties of construction building materials.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Properties and types of cement.
- Tests of cement.
- Properties and types of aggregate (fine and coarse Agg).
- Tests of aggregate.
- Introduction and types of metals.
- Evaluating the properties of construction materials (cement – fine aggregate – coarse aggregate – metals) according to standards.
- Mechanical behavior of ductile metals under tension, compression, flexure.
- Mechanical behavior of semi ductile metals under tension, compression, flexure.
- Mechanical behavior of brittle metals under flexure.

1. Course Number and Name

CIS 222 -Reinforced Concrete & Foundations

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Abdelaziz, Mahmoud

4. Textbook and Supplemental Materials

- Wang, Samon and Pincheira, Reinforced Concrete Design, John Wiley & Sons, 7th. Ed., 2007.
- Housing and Building National Research Center, Egyptian Code for Design and Construction of Reinforced Concrete Structures, 203, 2007.

5. Course Information

Catalog Description: Design of short columns under centric loads. Design of Reinforced concrete shallow foundations, Design of simple and continuous girders, Design of concrete frames. Concrete dimensions of big halls using arches and shells.

Prerequisites: None. **Corequisites:** None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Design of short columns under centric loads.
- Design of Reinforced concrete shallow foundations.
- Design of simple and continuous girders.
- Design of concrete frames.
- Identify Concrete dimensions of big halls using arches and shells.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

7. List of Topics

The major topics covered in this course are:

- Primary and secondary load on structures.
- Ultimate state design method
- Design of simple beam
- Design of continuous beam
- Design of short columns
- Design of frames
- Layout of halls by using arches and shells
- Design of isolated Reinforced concrete footing
- Design of combined Reinforced concrete footing
- Design of strap Reinforced concrete footing

1. Course Number and Name

CIS 231 - Design of Steel Structures 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

E. Tobbala, Dina

4. Textbook and Supplemental Materials

- Gorenc B., Tinyou R. and Syam A., steel designers hankbook, UNSW press 7th Ed.,2005.

5. Course Information

Catalog Description: Study Structural steel technology: Metallurgy of steel fracture, Steel grades, Fatigue. Design synthesis: Structural systems, Lateral resistance and bracing systems, Codes and specifications. Elements design: structural behavior of members, Introduction to design philosophies, Local buckling and cross section classification, Tension members, struts columns, Bending of beams, Torsion of beams, beam - columns and frame structures.

Prerequisites: CIS 112 - Structural Analysis 1.

Corequisites: None **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Prepare a report using a self-learning strategy about steel structure technology, metallurgy of steel fracture and fatigue.
- Illustrate the general layout of steel structure
- Identify properties and sections of steel structure and determine various loading conditions that are important in structural design and select critical loads.
- Design elements of a truss system that are integral parts of the overall structural design.
- Design beams, and column that are integral parts of the overall structural design.
- Design frame structure.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

7. List of Topics

The major topics covered in this course are:

- Types and properties of structural steel
- Introduction to structural design philosophy
- Specifications and building codes
- Selection of loads
- Design and analysis of tension members
- Considerations in the design of axially loaded compression members
- Effective lengths, stiffness reduction factors, and base plates in column
- Analysis of beams
- Design of beams for moments
- Design of continuous beams
- Strength of beams in bending
- Bending and axial forces in beam-columns
- Bolted connections
- Eccentrically loaded bolted connections
- Welded connection

1. Course Number and Name

CIW 232 – Sanitary Installations in Buildings

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

El Shahat, Sherein

4. Textbook and Supplemental Materials

- Wise AF, Swaffield JA. Water, sanitary and waste services for buildings. Routledge; 2012 May 23.
- A.C. Panchdhari, Water Supply And Sanitary Installations, New Age International, 2005.
- Sanitary Plumbing and Drainage (Classic Reprint) Paperback – June 23, 2017
- Tilley E. Compendium of sanitation systems and technologies. Eawag; 2014.

5. Course Information

Catalog Description: This course aims to design and allocate the sanitary appliances, sanitary drainage, vent systems, and feeding networks in the buildings.

Prerequisites: None

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify and discuss the sanitary appliances and their allocation in the building that suite the user needs and environment constrains.
- Apply and determine the types of water feeding and storage in and out the building and how they be applied in the targeted engineering drawings.
- Apply and determine the types of sanitary drainage and vent systems in and out the building and how they be applied in the targeted engineering drawings.
- Determine the impact of the applied drawings on the building and its context.
- Calculate daily needs of water supply storage/ pipes in the residential building.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction to Sanitary Installations in Buildings
- Layout of sanitary appliances in: Bathrooms, Kitchens, Toilet compartments.
- Cold and hot water supply systems
- Water storage systems.
- Sanitary drainage and vent systems.
- Collection and drainage of rainwater from roofs and open area.

1. Course Number and Name

CIW 121 - Engineering Surveying

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42)

3. Course Coordinator

Abo Bakr, Ahmed

4. Textbook and Supplemental Materials

- Engineering surveying, Wilfred Schofield and Mark Breach, Elsevier, 6th Ed., 2007.

5. Course Information

Catalog Description: The purpose of this course is to understand the fundamentals of plane surveying, different systems of units, distance & levels measuring instruments.

Prerequisites: None

Corequisites: None **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify the appropriate solutions for engineering problems based on analytical thinking
- Applying the field sketches, electronic methods of linear measurements.
- Realize and observe level, azimuth, angles and their associated error and Methods of calculating coordinates.
- Calculate levels, land division, introduction to theory of errors in plane surveying, and the appropriate numbering for any map according to the known arranging system.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
3. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Introduction to mapping and surveying science.
- The surveying maps, Scales and measurements, electronic units. Field sketches.
- Electronic methods of linear measurements and their corrections kinds of directions.
- Defining surveying level.

1. Course Number and Name

MEP 342 - Air Conditioning in Buildings

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Eid, Mohamed

4. Textbook and Supplemental Materials

- William K. Y. Tao & Richard R. Janis, Mechanical and Electrical Systems in Buildings, Prentice Hall, Inc., 2nd. Ed., 2001.
- Whitman. Johnson & Tomczyk, 2000 "Refrigeration And Air Conditioning Technology" 4th Edition, Delmar.
- Althouse. Turnquist. Bracciano, 1996 "Modern Refrigeration And Air Conditioning" The Goodheart-Willcox Company, Inc.

5. Course Information

Catalog Description: Methods of heat transfer to and from buildings and basic definitions related thereto, Learn about heating systems in buildings using water or hot air, as well as learn about the methods of air exchange, ventilation and industrial air conditioning, and the types of devices used, Insulation methods and materials used in buildings.

Prerequisites: None **Corequisites:** None **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Determine methods of thermal transformation from and to building.
- Identify methods of thermal isolation and worming of building.
- Identify methods of artificial air conditioner and natural ventilation of building.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- Methods of thermal transformation from and to building.
- Methods of thermal isolation and worming of building
- Methods of artificial air conditioner and natural ventilation of building
- Selection a case study
- Initial applying on the selected case study.
- Approved the modification on the work.
- Final changes of the work.

1. Course Number and Name

BAS 021 – Physics 1

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Rabea, Ayamn.

4. Textbook and Supplemental Materials

- Shipman, Wilson, Todd, An introduction to physical Science, D.C.Health and Company, Toronto, 1990.

5. Course Information

Catalog Description: Measurements : Physics and measurements – (Length , mass , time , the international system of unit SI) Elastic properties of solid (stress, Strain , International system of unit SI) Elastic properties of solid (stress, strain, elastic modules ...) Dynamic of ideal fluid) static and dynamic) – oscillatory motion : Wave motion , sound Waves, thermodynamics, temperature, heat and first Law of thermo dynamics, kinetic theory of gases , heat engines, ntropy and the second law of thermodynamics, Newton’s law of gravitation and applications – potential – Energy – Continuity equation – Oscillations – simple harmonic motion . Electrostatics : Electric charge and Coulomb’s law – Gauss law – Electrostatic field- Electrostatic field – Electrostatic potential – Dielectrics and capacitances – Energy.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify and display dimensional analysis, elastic properties of solid materials, oscillatory motion and dynamics of ideal fluid.
- Describe and define Coulomb’s and Gauss’ laws and principles of electrostatics.
- Acquiring the principles of design, a conducting experiment within realistic constraints to analyze performance.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Physics and Measurements for
- Electrical Force
- Electrical Potential
- Capacitor and Capacitance.
- Electrical Current.
- Fluid Mechanics
- Mechanical properties of metals
- Oscillation

1. Course Number and Name

BAS 022 – Physics 2

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Gebril, Ahmed (Senior) & Mahrous, Hamdy.

4. Textbook and Supplemental Materials

- Shipman, Wilson, Todd, An introduction to physical Science, D.C. Health and Company, Toronto, 1990.
- Richard T. Weidner, Physics – Revised Version, Allyn and Bacon, Boston, USA, 1989.
- Serway – Beicher, Physics for Scientists and Engineering with Modern, Saunders Collage Publishing, USA, 1989.

5. Course Information

Catalog Description: Principal of heat and Thermodynamics: Temperature- Heat – thermal expansion – quantity of heat – First law of thermodynamic – Entropy and the second law of thermodynamic – Car not engine – the absolute temperature scale. Electricity and magnetism: Electrical current and resistance – Ohm’s law- electric power – semiconductors – electromotive force – Kirchoff’s rules – Magnetic fields – Maxwell equations – Ampere’s law, Maxwell s equations – Fraday’s – Gauss’s law.

Prerequisites: BAS 021.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Demonstrate and describe electrical circuits, electrical power, magnetic fields, considering Kirchoff, faraday and Maxwell’s equations.
- Display and define different units of temperature measurement and concept of heat transfer, recognizing first and second law of thermo dynamics.
- Acquiring the principles of design, a conducting experiment within realistic constraints to analyze performance.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Temperature and first law of thermodynamics.
- Heat, thermal expansion and Laws of thermodynamics.
- Current and resistance.
- Direct current circuits.
- Magnetism.
- Optics.

1. Course Number and Name

BAS 041 – Engineering Chemistry

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Al-Azaly, Ali (Senior) & Gebriel, Ahmed

4. Textbook and Supplemental Materials

- Theodore L. Brown, et al, Chemistry the central Science, Prentice Hall Int. (Personal International Latest edition), 2009.

5. Course Information

Catalog Description: Introduction to physical and engineering chemistry which include the studying of how matter behaves on a molecular and atomic level and how chemical reactions occur based on understanding chemical properties and describing their behavior using theories of physics and mathematical computations.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- State the fundamental properties of matter, the general characteristics of solutions and the principles of equilibrium to chemical systems.
- Apply skills for determining quantities of matter and energy in fuel combustion, perform calculation with thermodynamic function.
- Discuss the constructions of electrochemical and chemical industrial processes for production of cement and fertilizer.
- Use laboratory equipment to conduct engineering chemistry experiments approaches.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to develop and conduct appropriate experimentation, analyse and interpret data, and use engineering judgment to draw conclusions.

7. List of Topics

The major topics covered in this course are:

- Equations of state.
- General properties of solutions.
- Basic principles in Electrochemistry.
- Dynamic Equilibrium in physical and chemical.
- Introduction to chemical Thermodynamics.
- Introduction to Corrosion Engineering.
- Industry and chemistry of Cement.
- Chemical Fertilizer Industries.

1. Course Number and Name

MED 111 – Principles of Manufacturing Engineering

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Al-Sadat, Maher.

4. Textbook and Supplemental Materials

- Serop Kalpakjian, Steven Schmid, manufacturing engineering & technology, Prentice Hall, 6th Ed., 2009.

5. Course Information

Catalog Description: Material properties, Casting Operations, Plastic Deformation, Bulk Deformation, Welding Processes, Sheet Metal forming, Machining Process.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Understand the basic principles of manufacturing processes (assessed through homework, assignments, exams, and project).
- Identify the engineering materials and their types.
- Identify skills to describe casting and molding processes, joining processes, fusion welding and forming of metals and plastics.
- Apply the ideal manufacturing method for metal cutting.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

7. List of Topics

The major topics covered in this course are:

- Equations of state.
- General properties of solutions.
- Basic principles in Electrochemistry.
- Dynamic Equilibrium in physical and chemical.
- Introduction to chemical Thermodynamics.
- Introduction to Corrosion Engineering.
- Industry and chemistry of Cement.
- Chemical Fertilizer Industries.

1. Course Number and Name

MED 011 – Engineering Drawing and Projection.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Al-Sadat, Maher.

4. Textbook and Supplemental Materials

- Richard Shelton Kirby, the fundamentals of mechanical drawing, Nabu press, 2009.
- Cecil Jensen, Jay Helsel, Dessin Short, engineering drawing and design, McGraw Hill, 7th, Ed., 2007.

5. Course Information

Catalog Description: This course covers the fundamentals of mechanical engineering Working drawings and their standards. It introduces various types of mechanical elements in terms of function, terminology, geometry and common standards.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply the engineering standards and best practices in engineering drawing.
- Recognize the function, terminology, and common standards associated with the different types of mechanical elements.
- Practice on normal and auxiliary projection using computer drafting packages...etc.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

7. List of Topics

The major topics covered in this course are:

- Techniques and Skills of Engineering Drawing,
- Normal and auxiliary projections.
- Solid geometry.
- Intersections between planes and solids.
- Development, sectioning, drawing and joining steel frames.
- Assembly drawing of some mechanical parts reading drawings
- Steel Structures.

1. Course Number and Name

BAS 031 – Mechanics.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

4 (56) / SPRING

3. Course Coordinator

El-Kalla, Ibrahim.

4. Textbook and Supplemental Materials

- Engineering Mechanics: Statics, 9e, Hibbeler, 2001, Prentice Hall.

5. Course Information

Catalog Description: Resultant of forces, Moment of forces, Equilibrium of rigid body, Projectile Particle motion and Newton's law of motion.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify, formulate, and solve mechanical engineering problems.
- Determine the support reactions on a structure.
- Determine the resultant of a system of forces.
- Draw complete and correct free-body diagrams and write the appropriate equilibrium equations from the free-body diagram.
- Understand and use basic terms for the description of the motion of particles, vector functions and the fundamental laws of Newtonian mechanics.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7. List of Topics

The major topics covered in this course are:

- Resultant and equilibrium of concurrent Forces in 2D.
- Resultant and equilibrium of concurrent Forces in 3D.
- Non-Concurrent Forces and Moments in 2D and 3D
- Equilibrium of Rigid Body in 2D
- Equilibrium of Rigid Body in 3D
- Kinematics of a Particle.
- Curvilinear Motion.

1. Course Number and Name

BAS 011– Mathematics 1.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Ziada, Eman.

4. Textbook and Supplemental Materials

- E. Swokowski, M. Olinick, and D. Pence, Calculus, PWS Publishing Company- Boston, 2005.
- Mary Attenborough, Engineering Mathematics, McGraw – Hill Book Company Europe, 2006.
- R. Smith, and R. Minton, Calculus, Mc-Graw-Hill Companies, Inc., Boston, 2000.

5. Course Information

Catalog Description: Introduction to Functions, Partial fractions, Theory of equations, Matrices, System of algebraic equations and some mathematical and engineering applications series.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Gain an understanding of solving Partial fractions.
- Gain an understanding of solving system of algebraic equations and its applications.
- Gain an understanding of theory of equations.
- Gain an understanding of limits and continuity
- Gain hands-on usage of the lhopital Rule.
- How important Talyor and Macalurine theorems.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7. List of Topics

The major topics covered in this course are:

- Vector Algebra.
- Binomial theorem.
- Partial fractions.
- Theory of equations.
- Numerical methods.
- Matrices –System of algebraic equations and applications.
- Gauss elimination method.
- Differential Calculus.
- Function – Basic functions.
- Limits- Continuity.
- Derivatives – Indefinite forms - Talyor and Macalurine theorems.
- Application – Expansions – Curve fitting.
- Some mathematical and engineering applications – Approximation.
- Introduction to partial differentiation.

1. Course Number and Name

BAS 012– Mathematics 2.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / SPRING

3. Course Coordinator

Ziada, Eman.

4. Textbook and Supplemental Materials

- E. Swokowski, M. Olinick, and D. Pence, Calculus, PWS Publishing Company- Boston, 2005.
- Mary Attenborough, Engineering Mathematics, McGraw – Hill Book Company Europe, 2006.
- R. Smith, and R. Minton, Calculus, Mc-Graw-Hill Companies, Inc., Boston, 2000.

5. Course Information

Catalog Description: Introduction to Equation of second degree, Equation of pair of straight lines, Translation and rotation of axes, Conic sections, Indefinite integral, and Definite integral and application of definite integral.

Prerequisites None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Gain an understanding of solving indefinite integral methods.
- Gain an understanding of solving definite integral (direct and indirect).
- Gain an understanding of the conic sections.
- Gain hands-on usage of the application of definite integral.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7. List of Topics

The major topics covered in this course are:

- Equation of second degree – Equation of pair of straight lines – Translation and Translation and rotation of axes.
- Conic sections.
- Method of representing a vector in space – Equation of sphere and Surface of revolutions.
- Plain equation in space.
- Equation of second order – Translation, rotation of axis in space.
- Indefinite integral Method of method of Integration (theory and functions).
- Definite integral (direct and indirect).
- Application of definite integral (areas and volumes).
- Numerical integration.

1. Course Number and Name

BAS 212 - Statistics and probability theory.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

3 (42) / FALL

3. Course Coordinator

Sakr, Hesham.

4. Textbook and Supplemental Materials

- Arnold, Barry C., Narayanaswamy Balakrishnan, and Haikady Navada Nagaraja. A first course in order statistics. Society for Industrial and Applied Mathematics, 2008.

5. Course Information

Catalog Description: This course introduces the following topics:

- The birth of statistics, definition of statistics, presentation of statistical data.
- Sets and probabilities: random experiments, sample spaces, sets operations.
- Binomial distribution, the Poisson distribution, Poisson approximation of binomial probabilities. Continuous random variables.
- Sampling Theory and Inferences
- Regression and correlation.
- Validation the model, correlation coefficient.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Required.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify the introduction of statistic and probabilities.
- Describe and apply the tendency and dispersion measure.
- Solve various problems in discrete random variables and moments
- Realize the sampling theory and inferences.
- Identify simple regression and correlation

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7. List of Topics

The major topics covered in this course are:

- The birth of statistics, definition of statistics, presentation of statistical data.
- Sets and probabilities: random experiments, sample spaces, sets operations, counting data probability, conditional probabilities, Bayess' theorem.
- Discrete random variables, the Hyper - geometric distribution, Binomial distribution the Poisson distribution, Poisson approximation Of binomial probabilities Continuous random variables.
- Moments: central moments, Skewness measures, kurtosis measures, moment generating function.
- Simple regression and correlation: Simple linear regression by least square method
- Validation the model, correlation coefficient.

1. Course Number and Name

HUM 012 – English language 1.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Shahen, Hamdy.

4. Textbook and Supplemental Materials

- Mark Hancock & Annie McDonald, English Result - Intermediate Level, Oxford University press, Last Edition.

5. Course Information

Catalog Description: A practical approach to English for engineering: sentences in English – modals – slang – proverbs – order letters – a routing slip – memos – reports – the people in my life – how do you meet and greet? – How do you address people? – writing an E-self introduction – how to explain your point of view – how to talk about hopes and wishes – signs of the zodiac – CV.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- This course is for student of English who need training and guidance during and after their study at Nile Academy Higher Institute for Engineering. It is more useful to offer learners like materials, samples and train them in comprehension strategies to enable them to deal with materials. They must not be hurried but must feel that they can learn as many times as they need and that they can share and compare their understanding with fellow students.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- Talking English – miscellaneous topics.
- Speak English like a native speaker.
- Diverse topics.

1. Course Number and Name

HUM 013 – English language 2.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Shahen, Hamdy.

4. Textbook and Supplemental Materials

- Richard Acklam, Total English - Upper - Intermediate Level, Pearson Education Limited -
- Longman, Last Edition.

5. Course Information

Catalog Description: Talking English: greeting – weather – calling a friend – describing people – sports – invitation to a movie – sharing news and information – etc. Speaking English like a native: bobs day at work – bob returns home with bad news – teds day at school – Susan stays home and bakes cookies. Diverse topics: time expressions – dairy – conditional sentences – had better – relative pronouns- etc.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Display most of the linguistic features of the English spoken as well as written.
- Help Ss' towards understands the native toing of the English language and be able to negotiate with native spoken
- people with an ease.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- Talking English – miscellaneous topics.
- Speak English like a native speaker.
- Diverse topics.

1. Course Number and Name

HUM 011– Arabic Language.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

El-Gaiedy, Mahmoud.

4. Textbook and Supplemental Materials

- Adequate Grammar - Hassan Abbas
- Mosque of Arabic Lessons - Mustafa El Ghalayiny

5. Course Information

Catalog Description: The beauty of the Arabic language and its literature, and that the student acquires the ability to study the branches of the Arabic language. Helping the student to understand complex structures and ambiguous methods, and enable the student to think precisely and delicate mental research.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify the beauty of the Arabic language and its literature.
- Develop the literary taste of the student in order to realize the aesthetic aspects of speech styles, meanings and images.
- Develop the ability and skill of spelling and writing so that he can write correctly in all respects..

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- Arabic sentence between nominative and predicate
- Cases of parsing and construction of nouns and verbs
- Estimate each parsing and assigning some of its signs for some
- Arabic sentence transcripts and sentence changes
- The five verbs and the five nouns pictures of their expressions
- Cases of prevention from exchange
- Photo distinction number.

1. Course Number and Name

HUM 081 – Computer Skills.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

0 (0) / SPRING

3. Course Coordinator

Hegazi Ibrahim (Senior) & Mahrous, Hamdy.

4. Textbook and Supplemental Materials

- Norton, P. (2000). Peter Norton's introduction to computers. Glencoe/McGraw-Hill.
- Timothy J. O'Leary and Linda I O'Leary, "Computing Essentials, Complete 2010, McGraw Hill.

5. Course Information

Catalog Description: Principal of information technology: Introducing Computer Systems- Interaction with Your Computer – Processing Data– Storing Data– Using Operating Systems– Protecting Your Privacy. Modem CPUs: look inside the processors-advanced micro devices -microcomputers processor -intel processors. Storing Data: how data stored and organized on local disk – CD drive- internal memory structure-external memory structure. Using Operating Systems: operating systems basics – graphical user interface - built in applications – control panel navigation. Introduction to programing: flowcharts – algorithmic thinking - software development life cycle – start coding with visual basic.

Prerequisites None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply knowledge of information technology concepts to business needs and helping the development of student's computer skills that will support the educational process.
- Acquiring the principles of programming and prepare the student to handle more advanced computer science courses in upcoming years.
- This course also will give the appropriate computer background for non-specialist student.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Information technology fundamental.
- Programs flowcharts and algorithmic thinking
- Web design in HTML.

1. Course Number and Name

MED 021– History of Engineering & Technology.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / SPRING

3. Course Coordinator

El-Boghadady, Amr (Senior) & Al-Azaly, Ali.

4. Textbook and Supplemental Materials

- James E. McClellan & Harold Dorn, Science and Technology in World History: An Introduction, The Johns Hopkins University Press, 2nd. Ed., 2006.

5. Course Information

Catalog Description: History of civilization and technology development, humanities and social sciences, engineering education and its disciplines, scientific thinking and analysis, technology and training, different work methodologies and ethics, application examples, course project.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Gain an understanding History of civilization and technology development.
- Gain an understanding engineering education and its disciplines.
- scientific thinking and analysis, technology and training.

This course supports student outcomes by developing:

1. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- History of Civilization and Technology Development
- Humanities and Social Sciences
- Engineering Education and its Disciplines
- Scientific Thinking and Analysis
- Technology and Training
- Different work Methodologies and Ethics

1. Course Number and Name

IEN 131 – Monitoring & Quality Control Systems.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / FALL

3. Course Coordinator

Khashaba, Mohamed.

4. Textbook and Supplemental Materials

- Monitoring systems, Quality control and quality assurance systems, Prof. Dr. Mohamed I. Khashaba, 2021, Oakland, J.S., total quality management, Butterworth
- Heinemann, Oxford, 2nd Ed., 2000, Pyzdek, T., & Keller, P. A. (2003). The six-sigma handbook. McGraw-Hill, General Electric. (2006). Six Sigma. Available at: <https://www.ge.com/sixsigma/>. Accessed March 7, 2006,
- Henning Kagermann, et. All, Internal Audit Handbook, Springer - Verlag Berlin Heidelberg, 2008.

5. Course Information

Catalog Description: In order to achieve and effectively apply the Monitoring Systems & Quality Control, it is very important to look for a set of techniques driven by quality-control methodology and has its main focus on identifying and eliminating errors. Its goals for six standard deviations between mean and it is nearest detailing limit. It is used for detection, control, and management of the variation.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Demonstrate and apply the concepts and objectives of control systems, quality systems, top management communicating.
- Apply and Analyze Hazard Analysis: high - quality recommendations, commitment monitoring, follow up Systems, the base line of hazard analysis critical point (HACCP).
- Create new concepts, tools for organization and analysis of data, tools for determining and solving problems.
- Identify International Standards Accreditation: Accreditation meaning, ISO requirements and recommendations, Audit program, Certification body.
- Analyze Process Capability: Process capability indices, process performance indices.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction: Monitoring Systems & Quality Control.
- Quality control concepts.
- Control systems.
- Hazard analysis.
- Sampling and inspection.
- International standers accreditation.
- Analyzing process capability.
- Investigating the process of both DMAIC Process and Six Sigma
- Covering the 5 phases of 6-Sigma DMAIC and the tools that can be used in each stage. They can be used to identify problem areas in our organizational processes, generate practical solutions and implement them effectively.

1. Course Number and Name

HUM 182 – Analysis & Research Skills.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Al-Azaly, Ali (Senior) & Gebriel, Ahmed

4. Textbook and Supplemental Materials

- Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, 4th Edition, by John W. Creswell.

5. Course Information

Catalog Description: Introduction to analysis skills which illustrate analysis framework for engineering issues, taking into consideration the technical, economic, environmental and ethical aspects, and also how to use several research skills on WEB.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify methodologies of solving problems.
- Effectively manage tasks and resources.
- Write technical reports.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- Analysis Skills.
- Phases of problem solving.
- Role of creativity in the analysis.
- SWOT analysis for different alternatives.
- Importance of finding the relevant data, information, and knowledge.
- Search Skills.

1. Course Number and Name

HUM 111 – Technical Report Writing.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Desouki, Mahmoud (Senior) & Lashin, Samy.

4. Textbook and Supplemental Materials

- Riordan, D., 2013. Technical report writing today. Nelson Education.
- Hering, H., Hering, H. and Baumann, 2019. How to write technical reports. Springer Berlin Heidelberg.
- Handouts and World Wide Web.

5. Course Information

Catalog Description: The purpose of this course is to help students better understand reporting concepts from a different viewpoint required in working life. This course describes writing reports, the types of reports and their importance, and summarizes the different techniques.

Prerequisites HUM 013 – English language 2.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Communicate effectively with the Work environment and external community.
- Recognize ethical and professional responsibilities in engineering situations.
- Make informed judgments, and lead engineering projects.
- Work on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Essential elements of a technical report: Abstract - Summary - Contents - Objectives Details of the report including figures, images, video ...etc., - Conclusions - Recommendations - References using a standard format and the different electronic sources.
- Report Classification: Technical (Requirement specification, Analysis, Design, and Implementation).
- Administrative (Directed to different operational and management levels).
- Levels of confidentiality for the different reports. Report Composition: Logical presentation of the report and coordination between its components.
- Importance of using correct grammar and punctuation.
- Enhancing communication effectiveness by the use of different media.
- Report Implementation: Use of the appropriate software packages including any graphics or multimedia packages.

1. Course Number and Name

HUM 381 - Principles of Negotiation.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Gamal, Mohamed.

4. Textbook and Supplemental Materials

- Lewicki, J. R., Saunders, M. D., and Barry, B., Essentials of Negotiation, McGraw - Hill, 5th. Ed., 2011.

5. Course Information

Catalog Description: The objective of this course is to teach the Negotiation is a method by which people settle differences. It is a process by which compromise or agreement is reached while avoiding argument and dispute. In any disagreement, individuals understandably aim to achieve the best possible outcome for their position (or perhaps an organization they represent). However, the principles of fairness, seeking mutual benefit and maintaining a relationship are the keys to a successful outcome.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Use negotiation skills in a variety of situations
- Develop strategies to ensure positive outcomes
- Develop an Action Plan for use in the workplace
- Recognize the basic principles of negotiation and the need to negotiate in a sustainable way
- Analyze their negotiation style and develop confidence in win
- Recognize the various stages of effective negotiation
- Develop a coherent case and set clear objectives
- Recognize whether they are being cooperative or competitive
- Utilize effective interpersonal skills.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

- The major topics covered in this course are:
- Negotiation concept, attributes, and principles.
- Dynamic nature of negotiation.
- Ethics of negotiation.
- Psychological and social aspects of negotiation.
- Cooperative and competitive negotiations.
- Strategies and tactics of negotiation.
- Best practices in negotiations (case studies).

1. Course Number and Name

HUM 181 – Communication & Presentation Skills.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Gebriel, Ahmed.

4. Textbook and Supplemental Materials

- Gary Johns and Alan M.Saks, *Organizational Behavior*, Addison Wesley Longman, 2009.
- Scgermerhorn, Jr., R. J. and Osborn. N.R., *organizational Behavior*, John Wiley & sons, Inc., New york, 10th Ed., Ed., 2008.

5. Course Information

Catalog Description: Providing the student with the latest knowledge about the concepts characteristics, and types of managerial and interpersonal communications, as well as the concepts and requirement of good listening and presentation, and Developing the student's abilities and skills of effective communication, and good listening, as well as how to use the interpersonal and managerial communication methods and the presentation techniques in performance and dealing with others inside and outside the organization. Course Contents: Concept and nature of communication - communication model - Formal and informal communication - Interpersonal and managerial communication - Body language - written communications (Reports and memos) - Ten Commandments of effective communication - Good listing - Elements of effective presentation model - Preparation of good presentation - carrying out presentation - Discussion and dealing with objections - Evaluating presentation performance.

Prerequisites None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Providing the student with the latest knowledge about the concepts characteristics.
- Known types of managerial and interpersonal communications, as well as the concepts and requirement of good listening and presentation.
- Developing the student's abilities and skills of effective communication, and good listening, as well as how to use the interpersonal and managerial communication methods and the presentation techniques in performance and dealing with others inside and outside the organization.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Concept and nature of communication
- Communication model
- Formal and informal communication
- Interpersonal and managerial communication.
- Body language.
- Written communications (Reports and memos.
- Ten Commandments of effective communication
- Good listing
- Elements of effective presentation.
- Preparation of good presentation.
- Carrying out presentation.
- Discussion and dealing with objections.
- Evaluating presentation performance.

1. Course Number and Name

IEN 351 - Engineering Economics.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

El-Boghdady, Amr (Senior) & Sakr, Hesham & Mohamed, Warda.

4. Textbook and Supplemental Materials

- Newnan, Donald G., J. P. Lavelle & Eschenbach, Ted G, Engineering Economic Analysis, Austin, TX: Engineering Press, 8th. Ed., 2000.

5. Course Information

Catalog Description: The objective of this course is to teach the concepts of engineering economic analysis and its role in solving problems. It is designed to provide engineers with the tools needed for rigorous presentation of the effect of the time value of money on engineering decision making. The course isolates those problems that are commonly faced by engineers and develops the tools to properly grasp, analyses, and solve them. The tools introduced include present worth analysis, annual cash flow, rate of return, incremental analysis, future worth analysis, and payback period. The course also covers such topics as depreciation, after tax analysis, replacement analysis, inflation, and deflation.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Demonstrate fundamental, concepts, principles, theories and contemporary issues of engineering economy.
- Solve economy engineering problems.
- Recognize ethical and professional responsibilities in engineering economy through group discussion.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Introduction to Economy
- Introduction to Engineering Economy
- Time Value of Money
- Rate - Of Return ROR Computations
- Depreciation Models.

1. Course Number and Name

CIW 331 – Environmental Impact of Projects.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / FALL

3. Course Coordinator

Al-Azaly, Ali.

4. Textbook and Supplemental Materials

- John Glasson, Riki Therivel and Andrew Ghawiek, Introduction to environmental impact assessment, Routledge, 2005.

5. Course Information

Catalog Description: Introduction to study the environment and the availability of natural resources. Natural cycles for some basic elements (carbon, oxygen, Nitrogen...). Conflicts between developments, economics and environments.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Describe the material properties and their Characteristics in engineering projects.
- Judge engineering decisions considering safety, quality, and environmental impact.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Introduction: Availability of Natural Resources. Natural Cycles for Same Basic Elements.
- Conflicts between Developments, Economics and Environments.
- Defining Emissions Sources, Impacts, Standards and Precautions.
- Water, Air and Soil Pollution and Measurements.
- Historical Development for Recognizing the Need for Environmental Impact Assessment.
- Assessing the Impacts on Health, Social, Culture and Economic Activities.
- Procedures of the Environments Impact Assessment: Screening, Scoping.
- Defining Impacts, Comparing Alternatives.
- Plans for Mitigation and Alleviation, Environmental Auditing.

1. Course Number and Name

IEN 314 – Project Management.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Ibrahim, Hany (Senior) & El-Korani, Tamer.

4. Textbook and Supplemental Materials

- Frederick Gould and Nancy E. Joyce, Construction Project Management, Prentice Hall, 3rd Ed., 2008.

5. Course Information

Catalog Description: Providing an introduction to many facets of the project management. This course intent is to provide a practical demonstration of the basic management techniques commonly used or encountered on a construction project. Course Outlines: Project need determination and feasibility studies; Project Cost Evaluation and Estimating; Project Schedule development; Design/Construction Contract Development; - Project Engineering/Design; Engineering Procurement Specification development; Cost Accounting and Control; Labor availability Evaluation; Quality Assurance and Control; Safety; Project Closeout.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Identify project cycle, main parties involved in construction and types of construction projects.
- Plan activities of project and plan the project with different techniques.
- Monitor the project time and its needs.
- Estimate the cost of any activity and the percent of markup.
- Evaluate progress and deadlines as a routine basis and re-prioritize every-time something changes.
- Operate in team group report about specific topics

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

7. List of Topics

The major topics covered in this course are:

- Introduction
- Procurement Management
- Human Resource Management
- Planning and Scheduling
- Stakeholder Management
- Cost estimation
- Risk Management

1. Course Number and Name

HUM 351 – Professional Ethics.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / SPRING

3. Course Coordinator

Lashin, Samy.

4. Textbook and Supplemental Materials

- Ethics in Engineering Paperback – by Thomas Taro Lennerfors, 2019.
- Dr. Ayman Elzeiny, DataShow 127 "FIDIC", June 26, 2013.

5. Course Information

Catalog Description: Engage in self-and life-long learning and showing the importance of professional and ethical responsibilities; and contextual understanding.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Discuss humanitarian topics of interest and moral issues.
- Identify professional ethics and impacts of engineering solutions on society and Environment.
- Combine, exchange different ideas, views, and knowledge from a range of sources to evaluate the characteristics and performance of components, systems and processes.
- Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
- Exchange knowledge and skills with engineering community and industry.
- Identify the law of syndicate of engineers, its objectives and services for its members

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Global vision about Engineering Science & job of Engineer.
- Engineering Science is the indicator for any civilization.
- Being an Engineer is one of the finest and the highest job.
- Engineering job based on creativity, innovation and development from his own imagination.
- Serving the whole humanity and seeking for the quality in human life.
- Engineer's responsibility in the national and the international scale
- Vital role for the engineer according to the international engineering contracts (FIDIC)
- Responsibility of the engineers according to the Egyptian Laws.
- Job ethics and etiquette
- Global vision on the Engineers
- Syndicate law no. 66 for 1974

1. Course Number and Name

HUM 352 – Human Rights.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

1 (14) / FALL

3. Course Coordinator

Geith, Rasha.

4. Textbook and Supplemental Materials

- Essam Muhammad Ahmad Zanati, Human Rights Law, Arab Renaissance House,
- Abdel Wahid Al-Far, Human Rights Law in Positive Thought and Islamic Sharia 2010. And the Arab Renaissance House, 1987
- Egyptian Journal of International Law.
- Publications of the National Council for Human Rights

5. Course Information

Catalog Description: This course covers the importance of human rights and the historical formation of those rights and schools of jurisprudence to establish these rights and the provisions of special international agreements Human rights - and global and regional international organizations based on the protection of those rights - and the position of the Egyptian constitution on human rights - And legal protection for it at the national level and the international level - in addition to human rights in Islamic law. The philosophical historical origins of human rights - the global organs that are based on the protection of human rights (United Nations organs) - the national protection of human rights - human rights in Islamic law - a review of some human rights sects - a general review.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: SE.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply knowledge of the importance of human rights and the historical formation of those rights and schools of jurisprudence to establish these rights and the provisions of special international agreements Human rights.
- Human Rights in (Islamic law global and regional international organizations The philosophical historical origins).

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Familiarity With The Importance Of Human Rights And The Historical Formation Of Those Rights And Schools Of Jurisprudence To Establish These Rights And The Provisions Of Special International Agreements Human Rights.
- Global And Regional International Organizations Based On The Protection Of Those Rights
- The Position Of The Egyptian Constitution On Human Rights.
- Legal Protection For It At The National Level And The International Level
- Human Rights In Islamic Law.
- The Philosophical Historical Origins Of Human Rights.
- The Global Organs That Are Based On The Protection Of Human Rights (United Nations Organs).
- The National Protection Of Human Rights.
- Human Rights In Islamic Law.
- A Review Of Some Human Rights Sects A General Review.

1. Course Number and Name

HUM X75– Arabic & Islamic Civilization.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Al-Refa'ey, Riad.

4. Textbook and Supplemental Materials

- Ahmed Abdel Razek, Islamic Civilization in the Middle Ages, 2004.
- Fathia al-Nabrawi, History of Islamic Systems and Civilization, 1985.
- Abdel Moneim Majed, History of Islamic Civilization in the Middle Ages, 1978.

5. Course Information

Catalog Description: The foundations of Islamic civilization (the Qur'an and the Sunnah - the Arab nation - the language - the geographical framework - the open peoples - foreign influences) - the political system (the caliphate - the ministry - writing - the hijab) - the administrative system (local administrations - the burials of soldiers and al-Kharj, letters and mail etc.) - the financial system (the resources of the treasury - expenditures - the railroad) - the military systems (the army: its composition, weapons and methods - the fleet) - education and culture (legal sciences - theology and jurisprudence ... - mental sciences) - Arts, archeology and architecture - the judiciary and litigation - the Islamic community (elements and races - religious and sectarian sects - class construction: rulers and jurists), scholars, merchants, craftsmen and industries. Helping the student to understand complex structures and ambiguous methods, and enable the student to think precisely and delicate mental research.

Prerequisites None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Demonstrate knowledge of contemporary engineering issues.
- Discuss humanitarian topics of interest and moral issues.
- Discuss contemporary engineering topics in general.
- Combine, exchange different ideas, views, and knowledge from a range of sources.
- Exchange knowledge and skills with the engineering community and industry.
- Refer to relevant literature effectively.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- Foundations of Islamic civilization (Quran and Sunnah - the Arab nation - language)
- The political system (succession - ministry - writing - hijab)
- Administrative system (local administrations - offices of soldiers, al-kharaj and letters)
- Financial System (Bayt Al-Mal Resources - Expenditures)
- Military systems
- Education and culture
- Arts, archeology and architecture
- Judiciary and litigation - the Islamic community

1. Course Number and Name

HUM X71– Introduction to the History of Civilizations.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Mahrouki, Mahmoud (Senior) & Al-Refa'ey, Riad.

4. Textbook and Supplemental Materials

- Hussein Munis, Civilization, The World of Knowledge, Kuwait, 1978

5. Course Information

Catalog Description: The concept of civilization, the origins of human civilization the first civilizations beginnings, the culture and civilization in the ancient east, and in the ancient west, civilization and culture in the Middle Ages, Advancement of Science, Philosophy and Literature And the arts.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Gain an understanding the concept of civilization.
- Gain an understanding the origins of human civilization the first civilizations beginnings.
- Gain and understanding civilization and culture in the Middle Ages.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.

7. List of Topics

The major topics covered in this course are:

- The concept of civilization.
- The origins of human civilization the first civilizations beginnings.
- The culture and civilization in the ancient east.
- Philosophy and Literature And the arts.
- Advancement of Science.

1. Course Number and Name

HUM X72 – Trends in Contemporary Arts.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Qormod, Abdulllah.

4. Textbook and Supplemental Materials

- Hussein Munis, Civilization, The World of Knowledge, Kuwait, Stallabrass, Julian. Contemporary art: A very short introduction. Oxford University Press, USA, 2020.

5. Course Information

Catalog Description: The course aims to: Provide the student with the ability to gain artistic appreciation - Provide the student with the skill of reading artistic works - This is done by studying philosophies, trends, artistic movements, modern contemporary doctrines, etc. After modernity. The course includes the following topics: Introducing ancient arts as an introduction to philosophies, Classics - Introduction to Classical Arts and Greek Origins – Neoclassicism.

Prerequisites None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Gain an understanding the skill of reading artistic works.
- Gain an understanding philosophy, trends, artistic movements, modern contemporary doctrines, etc.
- Gain and understanding Introducing ancient arts as an introduction to philosophies.

This course supports student outcomes by developing:

1. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

7. List of Topics

The major topics covered in this course are:

- Ability to gain artistic appreciation.
- The skill of reading artistic works.
- Philosophies, trends, artistic movements, modern contemporary doctrines, etc.
- Introduction to Classical Arts and Greek Origins

1. Course Number and Name

HUM X73– Recent Egypt's History.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Ali, Mohamed.

4. Textbook and Supplemental Materials

- M. Abir, "Modernisation, Reaction and Muhammad Ali's 'Empire'" Middle Eastern Studies 13#3 (1977), pp. 295-313 online.
- Sanger, Patrick. "The Administration of Sasanian Egypt: New Masters and Byzantine Continuity." Greek, Roman, and Byzantine Studies 51.4 (2011): 653-665.
- El-Daly, Okasha. Egyptology: The Missing Millennium. London: UCL Press.

5. Course Information

Catalog Description: This course covers the importance of knowing the historical formation of Egypt and the most famous era in the recent history. To establish a useful background about our history.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Apply knowledge of the importance of Egypt History and the historical formation of Egypt in the recent history.
- Trying to take advantage of historical situations in engineering and construction science.

This course supports student outcomes by developing:

1. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Early Islamic Egypt
- Independent medieval states
- Ottoman Egypt
- Muhammed Ali Dynasty
- British Protectorate (1882–1952)
- Republican Egypt (since 1953)
- Nasser era
- Sadat era

1. Course Number and Name

HUM 221 – Business Administration.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Ali, Mohamed.

4. Textbook and Supplemental Materials

- J. Bryson, Strategic planning for public and nonprofit organization, San Francisco, Jossey-Bass.

5. Course Information

Catalog Description: The purpose of this courses to help students better understand the business administration concepts through an engineering point of view that are mostly needed nowadays. This course describes the properties and characteristics of business administration and its importance, summarizes the different methods of administration.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Communicate effectively with the Work environment and external community.
- Recognize ethical and professional responsibilities in engineering situations.
- Make informed judgments, and lead engineering projects.
- Work on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

This course supports student outcomes by developing:

1. An ability to communicate effectively with a range of audiences.
2. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

7. List of Topics

The major topics covered in this course are:

- Nature, scope, importance & characteristics of business administration.
- Functions of management.
- Organization concept & importance, characteristics of good & effective organization.
- Direction & supervision.
- Control: concept & importance of control.
- Decision Making.

1. Course Number and Name

CIS 111 – Principles of Construction & Building Engineering.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Ibrahim, Hany.

4. Textbook and Supplemental Materials

- Madan Mehta, Walter Scarborough, Diane Armpriest, Building Construction: Principles, Materials, and Systems, Prentice Hall, 2009

5. Course Information

Catalog Description: Handels properties, behavior, fabrication of building materials and Types of different loads. It also describes traditional and advanced building materials, bearing walls and structure systems. Structure analysis of different structural elements and properties of sections. Moreover, different types of foundation also discussed.

Prerequisites: None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Understand properties, behavior and fabrication of building materials.
- Assess and evaluate the characteristics and performance of components, systems and processes.
- Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.
- Apply safe systems at work and observe the appropriate steps to manage risks.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

7. List of Topics

The major topics covered in this course are:

- Introduction.
- Properties of building materials.
- Different types of building systems.
- Types of foundations.
- Simple design of reinforced concrete columns.
- Special types of concrete.

1. Course Number and Name

ELP 111 – Principles of Electrical Engineering.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / FALL

3. Course Coordinator

Eid, Mohamed.

4. Textbook and Supplemental Materials

- B.L. Theraja and A.K. Theraja, “Electrical Technology” Shanda & Company LTD, RamNagar New Delhi-110 055, Twenty Fourth Edition 2005; Multicolor Edition 2005, Reprint 2013.
- James W. Nilsson and Susan A. Riedel, “Electric Circuits”, Pearson Education, Inc., publishing as Prentice Hall, Street,
- Upper Saddle River, New Jersey, ninth edition, Copyright 2011.
- M.L.Soni, A Course in Electrical circuit analysis, Dhanpat Ral, New Delhi,7th Ed.,2011
- N C Jagan, electrical circuit analysis, Aditya Offset, india,1st Ed.,2012

5. Course Information

Catalog Description: DC Electric Circuit Analysis, AC Electric Circuit Analysis, Circuits under Transient Conditions, Single-phase transformers, Three-phase induction motors, Single- phase induction motors, Speed control of motors, Three-phase generators, Power systems elements, Electrical Installation, Transmission lines, Electrical cables, Measuring and protection devices.

Prerequisites BAS 022.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Analyse a mathematical and scientific of electrical circuits.
- Understand the construction, theory, operation, and the various applications of single-phase transformers.
- Learn the concepts and theories of mathematics and science for electrical machines.
- Knowing the concepts and theories of protection and measuring devices of electric power system elements.
- Familiarize with the electrical installations of interior lighting for residential.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

7. List of Topics

The major topics covered in this course are:

- DC Electric Circuit Analysis
- AC Electric Circuit Analysis
- Circuits under Transient Conditions.
- Single- phase transformers.
- Three - phase induction motors.
- Single - phase induction motors.
- Speed control of motors.
- Three- phase generators.
- Power systems elements.
- Electrical installations.
- Transmission lines.
- Protection circuits and devices.
- Electrical cables, measuring devices and recorders.

1. Course Number and Name

ELE 121 – Principles of Electronic Engineering.

2. Credits (Contact Hours/Week for Fall/Spring Semester)

2 (28) / SPRING

3. Course Coordinator

Mohammed, Warda.

4. Textbook and Supplemental Materials

- Albert Paul Malvino, David J. Bates, Patrick E. Hoppe, Electronic Principles, 9th Edition, 2020
- Sedra, Adel S., and Kenneth C. Smith. Microelectronic circuits. New York Oxford: Oxford University Press, 2014.
- Boylestad, Robert L., Louis Nashelsky, and Franz Monssen. Electronic devices and circuit theory, Pearson Prentice Hall, 2006

5. Course Information

Catalog Description: Introduction to Electronic Components: PN junction Diodes, Special Diodes, Bipolar junction transistor and provide an overview about op-amp and microprocessors. It also provides the usage of diodes for different applications and apply mathematical methods on circuit analysis.

Prerequisites None.

Corequisites: None. **Pre or Corequisites:** None.

Type of Course: Elective.

6. Course Objectives and Outcomes

Students who successfully complete this course will be able to:

- Introduce an overview about PN junction, BJT construction, Op-amp, and Microprocessor.
- Use suitable analysis principles for analyzing electronics circuits
- Use and apply diodes to perform OR and logic functions.
- Design appropriate specifications for required diode circuit.

This course supports student outcomes by developing:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

7. List of Topics

The major topics covered in this course are:

- Electronic components: PN junction Diodes, special diode
- Diode applications, Rectifiers, and Peak detectors
- Logic circuits
- Operational amplifiers- Bipolar junction transistors
- Analog signal measurement, digital signal
- Microprocessors, CPU, interfacing with memory, interfacing with input and output ports.