Assiut University

Faculty of Computers & Information

Information Systems Master Program 2021-2022

IS Master Program

Table of Contents

Program Specifications 2021- 2022

IS Master Program Specifications

A. Basic Information

1. **Program Title:** Master in Computers and Information (Information Systems)
2. **Program Type:** Single
3. **Faculty (Faculties):** Faculty of Computers and Information
4. **Department:** Information Systems
5. **Assistant Coordinator: Dr. Ibrahim ElAwadi**
6. **Coordinator: Prof.** Taysir H. Abdel-Hamid
7. **Last date of program specifications approval:** – 1/9/2021

B. Professional Information

1. Program Aims and Objectives

Successfully completing this program will contribute to some certain graduate attributes. Specifically, a graduate of Computers and Information (Information Systems) Master Program should be able to:

I. Apply scientific research basics and methodologies and using its various tools in information systems.
II. Apply analytical methodologies and use it in information systems domains.
III. Apply specialized knowledge in information systems and merge it with other related knowledge of his/her professional practice.
IV. Recognize current problems and vision of information systems.
V. Determine professional problems and find solutions for them.
VI. Master a suitable level of professional skills in information systems and use appropriate technology in his/her professional practices.
VII. Communicate effectively at work.
VIII. Lead team work and take decisions at different professional scenarios.
IX. Employ available resources efficiently to preserve them and maximize their utilization.
X. Show his/her awareness in community developing and preserving the environment according to the local and global changes.
XI. Assess with integrity, credibility and applying the rules of the profession.
XII. Develop his/her professional and academic skills, and adopt life-long self-learning.
XIII. Apply critical thinking to a particular challenge that might be experienced in a professional setting.
XIV. Improve the efficiency and effectiveness of any organization by organizing information and information systems.

2. Intended Learning Outcomes (ILOs)

a. Knowledge and Understanding

After completing the Master program in Computers and Information (Information Systems), the graduate should be able to:

a1. List theories and fundamentals in information systems and related domains.
a2. Describe effective exchange between professional practices and their reflection on the environment.
a3. Describe and apply scientific development in information systems.
a4. Recognize ethical and legal principles for professional practice in information systems.
a5. Deploy Quality principles of professional practice in information systems.
a6. Apply the fundamentals of scientific research and its ethics.
a7. Locate and classify organization architecture and role of information systems in organizations.
a8. Assess influence of social and political issues in information systems.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b2. Solve specialized problems without enough inputs.
b3. Link different knowledge to solve professional problems.
b4. Carry out a research study and write a thesis around a research problem in information systems.
b5. Assess risks in professional practice of information systems.
b6. Plan to develop the performance in information systems.
b7. Deploy professional decisions in different scenarios.
b8. Design and develop intelligent and traditional computer-based systems, using formal design procedures where appropriate.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in information systems.
c2. Write and evaluate professional reports.
c3. Evaluate the strengths and weaknesses of particular solutions in information systems.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Communicate efficiently by different means.
d2. Use the information technology to serve the professional practice.
d3. Have self-assessment and identification of personal learning needs.
d4. Deploy different recourses to obtain information and knowledge.
d5. Propose roles and indicators to evaluate the performance of the others.
d6. Work in a team and lead teams in different professional tracks.
d7. Manage time efficiently.
d8. Practice Long-life self-learning.
d9. Synthesize ideas from multiple sources.
d10. Develop an argument in a coherent and logical manner

3. Academic Standards

The academic standards invoked in this specification are driven from a number of resources:

a. The generic standards in the "Guide of Academic Standards for Graduate Programs" published by the National Authority for Quality Assurance & Accreditation (NAQAAE) on March 2009.
b. University of North Carolina, USA, M.Sc. in information sciences program.
c. University of Edinburgh, UK, Master of Informatics.

4. Curriculum Structure and Contents

4a. Program duration: at least 2 years.

4b. Program structure

- No. of hours per week: Lectures (6), Lab./Tut. (0), Total (10)
- No. of credit hours: Compulsory (6), Elective (12), seminar (2), thesis (16)
- No. of hours of basic computing: 6 credits, 40%
- No. of hours of specialized information systems courses: 12 credits, 60%
- Field Training: Not compulsory
- Program Levels (in credit-hours system): Not applicable.

5. Program Courses

5a. Compulsory Courses

Course Code / No.	Course Title	Units No	No. of hours /week			Year	Semester	Achieved ILOs
			Lect	Lab	Exer			
IS600	Big Data Management	3	2	–	–	1st	1st + 2nd	a3, a5, b1, b3, b4, b5, b6, b8, c1, c3, d2, d4, d9
IS601	Research Methodologies	3	2	–	–	1st	1st + 2nd	a1, a3, a6, b1, b2, b3, b4, b6, c1, c2, d2, d3, d8, d9
TOTAL		6	4	–	–			

5b. Elective Courses

Course Code / No.	Course Title	Units No	No. of hours /week			Year	Semester	Achieved ILOs
			Lect.	Lab	Exer.			
1	Elective Course I	3	2	–	–	1st	1st + 2nd	a1, a2, a3, a5, a6, a7, a8, b1, b2, b3, b5, b6, b7, c1, c3, d1, d2, d4, d8

Course Code / No.	Course Title	Units No	No. of hours /week			Year	Semester	Achieved ILOs
			Lect.	Lab	Exer.			
2	Elective Course II	3	2	–	–	1st	1st + 2nd	a1, a2, a3, a5, a6, b1, b2, b3, b5, b6, b7, c1, c3, d1, d2, d4, d8, d9, d10
3	Elective Course III	3	2	-	-	1st	1st + 2nd	a1, a2, a4, a6, a8, b1, b3, b6, b7, c1, c2, d1, d4, d8, d10
4	Elective Course IV	3	2	-	-	1st	1st + 2nd	a2, a4, a5, a6, a8, b2, b3, b5, b6, b7, c2, c3, d1, d2, d4, d6, d8, d9
T O T A L		12	8	–	–			

Elective Courses	
Course Code	Course Title
IS602	Big Data Analytics
IS603	Intelligent Information Retrieval Systems
IS604	Digital Education
IS605	Algorithms for Data Science
IS606	Social Network Analytics I
IS607	Information Visualization
IS608	Advanced Database Management
IS609	Knowledge Management
IS610	Semantic Data Integration
IS611	Data Protection and Preservation
IS612	Research Seminars in Informatics
IS613	Selected Topics in Information Systems I
IS614	Selected Topics in Information Systems II
CS600	Advanced Topics in Machine Learning
CS603	Grid and Cloud Computing
CS606	Natural Language Processing
CS610	Deep Learning
BNF604	Research Seminars in Bioinformatics

5c. Seminar

Course Code / No.	Course Title	Units No	No. of hours /week			Year	Semester	Achieved ILOs
			Lect	Lab	Exer			
	Seminar	2	2	–	–	1st	2nd	a1, a2, a3, a5, a6, a7, a8, b1, b3, b4, b5, b6, b8, c1, c2, c3, d2, d3, d4, d5, d6, d7, d8, d9
T O T A L		2	2	–	–			

5d. Master Thesis

No.	Title	Units No	Year	Semester	Achieved ILOs
1	Master Thesis	16	2nd	1st + 2nd	a2, a3, a4, a5, a6, b1, b2, b3, b4, b5, b6, b7, c1, c2, c3, d2, d3, d4

6. Contents of Courses

Syllabus: See below

7. Program Admission Requirements

High score in secondary school education certificate in (mathematic section).

8. Regulations for progression and program completion

Please, refer to faculty bylaw (curriculum of undergraduate programs), 2004, pages 4-5.

9. Student Assessment (Methods and rules for student assessment)

Method (tool)	Intended leaning outcomes assessed
1- Written examinations	Knowledge and Understanding - Intellectual Skills - Professional Skills - General Skills
2- Oral examination	Knowledge and Understanding - Intellectual Skills - General Skills
3- Thesis	Knowledge and Understanding - Intellectual Skills - Professional Skills - General Skills

10. Program Evaluation

Evaluator	Tool	Sample
1- Senior students		
2- Alumni	Questionnaire	
3- Stakeholders		
4-External Evaluator(s) (External Examiner(s))	Report	
5- Other		

Program Coordinator: Prof. Taysir Hassan Abdel Hamid

Signature:

Date: 1/9/2021

Department Head: Prof. Taysir Hassan Abdel Hamid

Signature:

Date: 1/9/2021

Approved by the Dean: Prof. Taysir Hassan Abdel Hamid

Signature:

Date: 1/9/2021

Program Matrix

IS Master Program Matrix

Program ILOs		a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	b5	b6	b7	b8	c1	c2	c3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10
Courses and Thesis	IS600			✓		✓				✓		✓	✓	✓	✓		✓	✓		✓		✓		✓					✓	
	IS601	✓		✓			✓			✓	✓	✓	✓		✓			✓	✓			✓	✓					✓	✓	
	EL1	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓		✓				✓		
	EL2	✓	✓	✓		✓	✓			✓	✓	✓		✓	✓	✓		✓		✓	✓	✓		✓				✓	✓	✓
	EL3	✓	✓		✓		✓		✓	✓		✓			✓	✓		✓	✓		✓			✓				✓		✓
	EL4		✓		✓	✓	✓		✓		✓	✓		✓	✓	✓			✓	✓	✓	✓		✓		✓		✓	✓	
	Seminar	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
	Master Thesis		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓						

Courses Specifications 2021-2022

Course Specifications

Relevant program	Master's in computers and information (Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	1st Year
Date of specification approval	1/9/2021

A. Basic Information

1. **Course Title:** Research Methodologies
2. **Course Code:** IS601
3. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2		2

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will be able to:

- Understanding Research Design and Methods.
- Developing Critical Analysis Skills.
- Ethical Considerations in Research.
- Communicating Research Findings.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. List theories and fundamentals in information systems and related domains
a3. Describe and apply scientific development in information systems.
a6. Apply the fundamentals of scientific research and its ethics.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b2. Solve specialized problems without enough inputs.

b3. Link different knowledge to solve professional problems
b4. Carry out a research study and write a thesis around a research problem in information systems.
b6. Plan to develop the performance in information systems.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in information systems.
c2. Write and evaluate professional reports.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d2. Use information technology to serve professional practice.
d3. Have self-assessment and identification of personal learning needs.
d8. Practice Long-life self-learning.
d9. Synthesize ideas from multiple sources.

Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Understanding Research Design and Methods	8h	--	a1, a3, a6, b1, c1
2	Developing Critical Analysis Skills	6h	--	b1, b2, b3, b6, d9
3	Ethical Considerations in Research	4h	--	a6, c2
4	Communicating Research Findings	8h	--	c2, d2, d9

3. Teaching and Learning Methods

4a. Lectures
4b. Tutorial Exercises
4c. Projects

4. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5b. Time Schedule

Assessment	**Week No**
Final Exam	13

5c. Grading System

Assessment	**Grade %**

Final Exam	70%
Year Work	30%

5d. Formative Assessment

Regular quizzes distributed throughout the whole semester.

5. List of References

6a. Course Notes

- Short course notes are available at the course homepage.

6b. Required Books (Textbooks)

- Yogesh Kumar Singh, *Fundamental of Research Methodology and Statistics*, 2021, MKCL.

6c. Recommended Books

- Uma Sekaran and Roger Bougie, Research Methods for Business: A Skill-Building Approach, 2021, Wiley.

6d. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

6. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Prof. Dr. Mohamed Mustafa Darwish

Signature:

Date: 1/9/2021

Department Head: Prof. Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Information Systems Program

Course Matrix

Course Name:	Research Methodologies	**Course Code:**	IS601

No	**Course Content**	**Teaching Weeks**	**ILOs**				**Teaching and Learning Methods**	**Assessment Tools**	**Criteria**
			a's	**b's**	**c's**	**d's**	**Lectures**	**Final Exam**	
1	Understanding Research Design and Methods.	4	1-3-6	1	1	□	✓	✓	Student evaluation, course file, exam results
2	Developing Critical Analysis Skills	3	-	1-2-3-6	-	9	✓	✓	
3	Ethical Considerations in Research	2	6	-	-	2	✓	✓	
4	Communicating Research Findings	4	-	-	2	2-9	✓	✓	

Course Coordinator	Prof. Dr. Mohamed Mustafa Darwish	Department Head	Prof.Dr. Taysir H. Abdel-Hamid

Course Specifications

Relevant program	Masters in computers and information (Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	1st Year
Date of specification approval	1/9/2021

A. Basic Information

1. **Course Title:** Elective Course I (Algorithms for Data Science)
2. **Course Code:** IS605
3. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	–	2

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will be able to:

- Mastering Core Algorithms
- Applying Algorithms to Real-World Data.
- Analyzing Algorithm Efficiency.
- Integrating Algorithms with Data Science Tools.
- Fostering Innovation in Algorithm Design

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. List theories and fundamentals in information systems and related domains.
a2. Describe effective exchange between professional practices and their reflection on the environment.
a3. Describe and apply scientific development in information systems.
a5. Deploy Quality principles of professional practice in information systems.

a6. Apply the fundamentals of scientific research and its ethics.
a7. Locate and classify organization architecture and role of information systems in organizations.
a8. Assess the influence of social and political issues in information systems.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b2. Solve specialized problems without enough input.
b3. Link different knowledge to solve professional problems.
b5. Assess risks in professional practice of information systems.
b6. Plan to develop the performance in information systems.
b7. Deploy professional decisions in different scenarios.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in information systems.
c3. Evaluate the strengths and weaknesses of particular solutions in information systems.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Communicate efficiently by different means.
d2. Use information technology to serve the professional practice.
d4. Deploy different recourses to obtain information and knowledge.
d8. Practice Long-life self-learning.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Mastering Core Algorithms	8h	----	a1, a3, a7, c1, c3
2	Applying Algorithms to Real-World Data	6h	-----	a5, a7, b1, b2, b3, c1
3	Analyzing Algorithm Efficiency	6h	----	a6, b1, b5, b7, c3
4	Integrating Algorithms with Data Science Tools.	4h	----	a3, a5, d2, d4
5	Fostering Innovation in Algorithm Design	2h	----	b3, b6, d1, d8

4. Teaching and Learning Methods

4a. Lectures
4b. Tutorial Exercises
4c. Projects

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5b. Time Schedule

Assessment	Week No
Final Exam	13

5c. Grading System

Assessment	Grade %
Final Exam	70%
Year Work	30%

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

- Short course notes available at the course homepage.

6b. Required Books (Textbooks)

- **Arthur K. Kordon**, *Algorithms for Data Science*, 2020, Springe.

6c. Recommended Books

- Jake VanderPlas, Python Data Science Handbook: Essential Tools for Working with Data, 2016, O'Reilly Media.

6d. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

7. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Prof.Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Department Head: Prof.Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Information Systems Program

Course Matrix

Course Name:	Elective Course I (Algorithms for Data Science)	**Course Code:**	IS605

No	Course Content	Teaching Weeks	ILOs				Teaching and Learning Methods	Assessment Tools	Criteria
			a's	b's	c's	d's	Lectures	Final Exam	
1	Mastering Core Algorithms	4	1-3-7	-	1-3	-	✓	✓	Student evaluation, course file, exam results
2	Applying Algorithms to Real-World Data	3	5-7	1-2-3	1	-	✓	✓	
3	Analyzing Algorithm Efficiency	3	6	1-5-7	3	-	✓	✓	
4	Integrating Algorithms with Data Science Tools.	2	3-5	-	-	2-4	✓	✓	
5	Fostering Innovation in Algorithm Design	1	-	3-6	-	1-8	✓	✓	

Course Coordinator	Prof.Dr. Taysir H. Abdel-Hamid	Department Head	Prof.Dr. Taysir H. Abdel-Hamid

Course Specifications

Relevant program	Masters in Computers and Information (Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	1st Year
Date of specification approval	1/9/2021

A. Basic Information

1. **Course Title:** Big Data Management
2. **Course Code:** (IS600)
3. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2		2

B. Professional Information

1. Overall aims of the course

Upon completing this course, the student will be able to:

- Understanding Big Data Concepts and Algorithms.
- Implementing Big Data Solutions.
- Analyzing and Managing Data at Scale.
- Handling Data Quality and Consistency.
- Exploring Advanced Topics in Big Data

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a3. Describe and apply scientific development in information systems.

a5. Deploy Quality principles of professional practice in information systems.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b3. Link different knowledge to solve professional problems.
b4. Carry out a research study and write a thesis around a research problem in information systems.
b5. Assess risks in professional practice of information systems.
b6. Plan to develop the performance in information systems.
b8. Design and develop intelligent and traditional computer-based systems, using formal design procedures where appropriate

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in information systems.
c3. Evaluate the strengths and weaknesses of particular solutions in information systems.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d2. Use information technology to serve the professional practice.
d4. Deploy different recourses to obtain information and knowledge.
d9. Synthesize ideas from multiple sources.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	understanding Big Data Concepts and Algorithms	7h	----	a3, c1, d4
2	Implementing Big Data Solutions	6h	-----	b1, b8, c1, d2
3	Analyzing and Managing Data at Scale	5h	----	b3, b6, c3
4	Handling Data Quality and Consistency	4h	----	a5, b5, c3
5	Exploring Advanced Topics in Big Data	4h		b4, d9

4. Teaching and Learning Methods

4a. Lectures
4b. Tutorial Exercises
4c. Projects

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5b. Time Schedule

Assessment	**Week No**

Final Exam	13

5c. Grading System

Assessment	**Grade %**
Final Exam	70%
Year Work	30%

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

- Short course notes available at the course homepage.

6b. Required Books (Textbooks)

- Balamurugan Balusamy, Nandhini Abirami R., Seifedine Kadry, and Amir H. Gandomi, Big Data: Concepts, Technology, and Architecture, 2020, Wiley.

6c. Recommended Books

- Rajkumar Buyya, Rodrigo N. Calheiros, and Amir Vahid Dastjerdi, Big Data: Principles and Paradigms, 2016, Wiley.

6d. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

7. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Dr. Mostafa Kamel

Signature:

Date: 1/9/2021

Department Head: Prof.Dr. Prof.Dr. Khalid Fathy

Signature:

Date: 1/9/2021

Information Systems Program

Course Matrix

Course Name:	Big Data Management	**Course Code:**	IS600

No	**Course Content**	**Teaching Weeks**	**ILOs**				**Teaching and Learning Methods**	**Assessment Tools**	**Criteria**
			a's	**b's**	**c's**	**d's**	**Lectures**	**Final Exam**	
1	understanding Big Data Concepts and Algorithms	3.5	3		1	4	✓	✓	Student evaluation, course file, exam results
2	Implementing Big Data Solutions	3		1-8	1	2	✓	✓	
3	Analyzing and Managing Data at Scale	2.5		3-6	3		✓	✓	
4	Handling Data Quality and Consistency	2	5	5	3		✓	✓	
5	Exploring Advanced Topics in Big Data	2		4		9	✓	✓	

Course Coordinator	Prof.Dr. Taysir H. Abdel-Hamid	Department Head	Prof.Dr. Taysir H. Abdel-Hamid

Course Specifications

Relevant program	Masters in Computers and Information (Information Systems)
Department offers the program	Computer Science
Department offers the course	Computer Science
Academic year	1st Year
Date of specification approval	1/9/2021

A. Basic Information

4. **Course Title:** Elective Course II (Deep Learning)
5. **Course Code:** CS610
6. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2		2

B. Professional Information

1. Overall aims of the course

Upon completing this course the student will have learned, through appropriate classroom and laboratory experiences, the following.

- Teach fundamental concepts and key architectures like CNNs, RNNs, and Transformers.
- Provide practical skills in implementing deep learning models using frameworks like TensorFlow and PyTorch.
- Apply deep learning to real-world problems in areas like computer vision and NLP.
- Develop model evaluation and tuning skills.
- Address limitations and ethical considerations of deep learning.
- Encourage engagement with current research and innovation in the field.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. Explain theories and fundamentals in Computer Science and related domains.
a2. Interpret scientific development in Computer Science.
a3. Outline the quality principles of professional practice in Computer Science.
a4. Identify the fundamentals of scientific research and its ethics.
a5. Define the principles and techniques used in the design of parallelizing compilers on shared and distributed memory architectures.
a6. A deep and systematic understanding of the academic discipline of Computer Science.
a7. A critical awareness of current problems and research issues in selected areas of Computer Science.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of Computer Science and take references from them for problem solving.
b2. Solve specialized problems without enough inputs.
b3. Link different knowledge to solve professional problems.
b4. Assess risks in professional practice of Computer Science.
b5. Plan to develop the performance in Computer Science.
b6. Establish techniques of research and enquiry are used to extend, create and interpret knowledge in Computer Science.
b7. Recognize the need for, and show an ability for, dealing with constantly changing technology and continuing professional development.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in Computer Science.
c2. Evaluate current methods and tools in Computer Science.
c3. Compute dependencies in software programs and develop program representations suitable for parallelizing software.
c4. Deal with complex issues at the forefront of the academic discipline of Computer Science in a manner, based on sound judgments, that is both systematic and creative; and be able to communicate conclusions clearly to both specialists and non-specialists.
c5. An ability to consistently apply knowledge concerning current research issues in computer science in an original manner and produce work that is at the forefront of the developments in the domain of the program of study.
c6. Generate and apply appropriate solutions to solve problems based on reasoned rationale.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Communicate efficiently by different means.
d2. Use the information technology to serve the professional practice.
d3. Use different recourses to obtain information and knowledge.
d4. Long-life self-learning.

d5. Effectively present ideas, designs and solutions in a logical framework in a variety of forms with proper language structure and mechanics, and to produce appropriate written documentation.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	**Neural Network Fundamentals:** Introduction to the basic building blocks of deep learning, including neurons, layers, activation functions, and backpropagation.	12	8	a1,a5,a7, b1,b2, c1,c6, d4,d5
2	**Convolutional Neural Networks (CNNs)**: Focus on deep learning architectures designed for processing and understanding image data.	9	8	a2,a3,a8 ,b3, b4, c2,c4, d2,d3
3	**Recurrent Neural Networks (RNNs) and LSTMs**: Study of models that handle sequential data, crucial for tasks like language modeling and time-series prediction.	12	8	a3,a8, b6,b7, c3,c5, d1
	Deep Learning Model Optimization: Techniques for improving model performance, including hyperparameter tuning, regularization, and optimization algorithms.	12	8	a4,a6, b5,b7, c5,c6, d2,d5

4. Teaching and Learning Methods

4a. Lectures

4b. Tutorial Exercises

4c. Workshops

4d. Projects

5. Student Assessment

5e. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5f. Time Schedule

Assessment	**Week No**
Final Exam	13

5g. Grading System

Assessment	Grade %
Final Exam	70%
Year Work	30%

5h. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6e. Course Notes

- Short course notes are available at the course homepage.

6f. Required Books (Textbooks)

- Build a Large Language Model (From Scratch).

6g. Recommended Books

- Machine Learning Q and AI.

6h. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

7. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Prof. Dr. Khaled Fathy

Signature:

Date: 1/9/2021

Department Head: Prof. Dr. Khaled Fathy

Signature:

Date: 1/9/2021

Information Systems Program

Course Matrix

Course Name:	Elective Course II (Deep Learning)	**Course Code:**	CS610

No	**Course Content**	**Teaching Weeks**	**ILOs**				**Teaching and Learning Methods**	**Assessment Tools**	**Criteria**
			a's	**b's**	**c's**	**d's**	**Lectures**	**Final Exam**	
1	Understanding Core Deep Learning Algorithms	4	1-3	-	1	-	✓	✓	Student evaluation, course file, exam results
2	Implementing and Optimizing Deep Learning Models	3	5	1-2	3	-	✓	✓	
3	Analyzing the Performance and Scalability of Models	2.5	-	5-6	3	-	✓	✓	
4	Exploring Advanced Topics in Deep Learning	2	3	3	-	4-9	✓	✓	
5	Ethical and Responsible AI Practices	1.5	6	7	-	1-10	✓	✓	

Course Coordinator	Prof. Dr. Kalid Fathy	Department Head	Prof.Dr. Khalid Fathy

Course Specifications

Relevant program	Masters in Computers and Information (Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	1st Year
Date of specification approval	1/9/2021

A. Basic Information

1. **Course Title:** Elective Course III (Digital Education)
2. **Course Code:** IS604
3. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2		2

B. Professional Information

1. Overall aims of the course

Upon completing this course the student will be able to:

- Understanding Digital Learning Environments.
- Integrating Technology into Education.
- Designing and Implementing Digital Learning Strategies.
- Evaluating the Impact of Digital Education.
- Addressing Ethical and Accessibility Issues

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. List theories and fundamentals in information systems and related domains.
a2. Describe effective exchange between professional practices and their reflection on the environment.
a4. Recognize ethical and legal principles for professional practice in information systems.

a6. Apply the fundamentals of scientific research and its ethics.
a8. Assess influence of social and political issues in information systems.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b6. Link different knowledge to solve professional problems.
b7. Deploy professional decisions in different scenarios

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in information systems.
c2. Write and evaluate professional reports.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Communicate efficiently by different means.
d4. Deploy different recourses to obtain information and knowledge.
d8. Practice Long-life self-learning.
d10. Develop an argument in a coherent and logical manner.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Understanding Digital Learning Environments.	6h	----	a1, a2, b1, d4
2	Integrating Technology into Education.	5h	-----	a1, c1, d4, d1
3	Designing and Implementing Digital Learning Strategies.	6h	----	b6, b7, c1, c2
4	Evaluating the Impact of Digital Education	5h	----	a8, b1, b7, c2
5	Addressing Ethical and Accessibility Issues	4h	----	a4, a6, d10, d8

4. Teaching and Learning Methods

4a. Lectures

4b. Tutorial Exercises

4c. Projects

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5b. Time Schedule

Assessment	Week No
Final Exam	13

5c. Grading System

Assessment	Grade %
Final Exam	70%
Year Work	30%

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

- Short course notes available at the course homepage.

6b. Required Books (Textbooks)

- Chris Dede, Digital Teaching Platforms: Customizing Classroom Learning for Each Student, 2016, Harvard Education Press.

6c. Recommended Books

- Rita C. Richey, James D. Klein, and Monica W. Tracey, Design and Development Research: An Overview, 2011, Routledge.

6d. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

7. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Dr. Mustafa Kamel

Signature:

Date: 1/9/2021

Department Head: Prof. Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Information Systems Program

Course Matrix

Course Name:	Elective Course III (Digital Education)	**Course Code:**	IS604

No	**Course Content**	**Teaching Weeks**	**ILOs**				**Teaching and Learning Methods**	**Assessment Tools**	**Criteria**
			a's	**b's**	**c's**	**d's**	**Lectures**	**Final Exam**	
1	Understanding Digital Learning Environments.	3	1-2	1	-	4	✓	✓	Student evaluation, course file, exam results
2	Integrating Technology into Education.	2.5	1	-	1	1-4	✓	✓	
3	Designing and Implementing Digital Learning Strategies.	3	-	6-7	1-2	-	✓	✓	
4	Evaluating the Impact of Digital Education	2.5	8	1-7	2	-	✓	✓	
5	Addressing Ethical and Accessibility Issues	2	4-6	-	-	8-10	✓	✓	

Course Coordinator	Dr. Mustafa Kaml	Department Head	Prof.Dr. Taysir H. Abdel-Hamid

Course Specifications

Relevant program	Master in Computers and Information(Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	1st Year
Date of specification approval	1/9/2021

C. Basic Information

4. **Course Title:** Elective Course IV (Social Networks Analytics)
5. **Course Code:** IS606
6. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	-	2

D. Professional Information

1. Overall aims of the course

Upon completing this course the student will be able to:

- Understanding Social Network Structures.
- Applying Analytical Techniques to Social Networks.
- Extracting Insights from Social Media Data.
- Evaluating the Impact of Social Networks
- Addressing Ethical and Privacy Issues in Social Network Analysis.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a2. Describe effective exchange between professional practices and their reflection on the environment.

a4. Recognize ethical and legal principles for professional practice in information systems.

a5. Deploy Quality principles of professional practice in information systems.

a6. Apply the fundamentals of scientific research and its ethics.
a7. Assess influence of social and political issues in information systems.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b2. Solve specialized problems without enough inputs.
b3. Link different knowledge to solve professional problems.
b5. Assess risks in professional practice of information systems
b6. Plan to develop the performance in information systems.
b7. Deploy professional decisions in different scenarios.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Write and evaluate professional reports.
c3. Evaluate the strengths and weaknesses of particular solutions in information systems.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Communicate efficiently by different means.
d2. Use information technology to serve the professional practice.
d4. Deploy different recourses to obtain information and knowledge.
d6. Work in a team and lead teams in different professional tracks.
d8. Practice Long-life self-learning.
d9. Synthesize ideas from multiple sources.

3. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Understanding Social Network Structures.	6h	----	a2, b3, d4
2	Applying Analytical Techniques to Social Networks.	6h	-----	b2, b6, c3, d2
3	Extracting Insights from Social Media Data.	5h	----	a5, b3, c2, d9
4	Evaluating the Impact of Social Networks.	5h	----	a7, b5, b7, d1
5	Addressing Ethical and Privacy Issues in Social Network Analysis	4h	----	a4, a6, d6, d9

4. Teaching and Learning Methods

4a. Lectures
4b. Tutorial Exercises
4c. Projects

5. Student Assessment

5a. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5b. Time Schedule

Assessment	Week No
Final Exam	13

5c. Grading System

Assessment	Grade %
Final Exam	70%
Year Work	30%

5d. Formative Assessment

Regular quizzes distributed along the whole semester.

6. List of References

6a. Course Notes

- Short course notes available at the course homepage.

6b. Required Books (Textbooks)

- **Arthur K. Kordon, *Social Network Analysis*, Cambridge University Press, 2024**.

6c. Recommended Books

- **Mohsen Jamali, Hamid R. Arabnia, Witold Pedrycz**, *Social Network Analysis: Theory and Applications*, 2020, Wiley.

6d. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

7. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Prof. Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Department Head: Prof. Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Information Systems Program

Course Matrix

Course Name:	Elective Course IV (Social Networks Analytics)	**Course Code:**	IS606

No	**Course Content**	**Teaching Weeks**	**ILOs**				**Teaching and Learning Methods**	**Assessment Tools**	**Criteria**
			a's	**b's**	**c's**	**d's**	**Lectures**	**Final Exam**	
1	Understanding Research Design and Methods.	4	2	3	-	4	✓	✓	Student evaluation, course file, exam results
2	Developing Critical Analysis Skills	3	-	2-6	3	2	✓	✓	
3	Ethical Considerations in Research	2	5	3	2	9	✓	✓	
4	Communicating Research Findings	4	7	5-7	-	1	✓	✓	
		2	4-6	-	-	6-9	✓	✓	

Course Coordinator	Prof.Dr. Taysir H. Abdel-Hamid	Department Head	Prof.Dr. Taysir H. Abdel-Hamid

Courses Specifications
2023- 2024

IS Master Program

Course Specifications

Relevant program	Master in Computers and Information(Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	2nd Year
Date of specification approval	1/9/2023

E. Basic Information

7. **Course Title:** Elective Course III (Intelligent Information Retrieval Systems)
8. **Course Code:** IS603
9. **Course hours per week:**

Lecture	Tutorial / Practical	Total
2	–	2

F. Professional Information

8. Overall aims of the course

Upon completing this course, the student will be able to:

- Understand and Explore Retrieval Models and Algorithms.
- Analyze Information Organization and Retrieval.
- Examine Advanced IR Topics and Technologies.
- Evaluate Information Retrieval Systems.
- Explore Applications of Natural Language Processing in IR.

9. Intended Learning Outcomes (ILOs) of the course

e. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a3. List theories and fundamentals in information systems and related domains.
a4. Describe effective exchange between professional practices and their reflection on the environment.
a5. Recognize ethical and legal principles for professional practice in information systems.
a7. Apply the fundamentals of scientific research and its ethics.
a9. Assess influence of social and political issues in information systems.

f. Intellectual Skills

On successful completion of this program, graduates should be able to:

b2. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b8. Link different knowledge to solve professional problems.
b9. Deploy professional decisions in different scenarios

g. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c3. Master basic and modern professional skills in information systems.
c4. Write and evaluate professional reports.

h. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d2. Communicate efficiently by different means.
d5. Deploy different recourses to obtain information and knowledge.
d9. Practice Long-life self-learning.
d11. Develop an argument in a coherent and logical manner.

10. Contents

No	Topic taught	No. of hours		ILOs
		Lecture	Tut/Prac	
1	Understand and Explore Retrieval Models and Algorithms.	6h	----	a1, a2, b1, d4
2	Analyze Information Organization and Retrieval.	5h	-----	a1, c1, d4, d1
3	Examine Advanced IR Topics and Technologies.	6h	----	b6, b7, c1, c2
4	Evaluate Information Retrieval Systems.	5h	----	a8, b1, b7, c2
5	Explore Applications of Natural Language Processing in IR.	4h	----	a4, a6, d10, d8

11. Teaching and Learning Methods

4d. Lectures
4e. Tutorial Exercises
4f. Projects

12. Student Assessment

5e. Tools

Final Exam	To measure knowledge, understanding, intellectual professional and general skills.
Projects	To measure professional and general skills

5f. Time Schedule

Assessment	**Week No**
Final Exam	13

5g. Grading System

Assessment	Grade %
Final Exam	70%
Year Work	30%

5h. Formative Assessment

Regular quizzes distributed along the whole semester.

13. List of References

6a. Course Notes

- Short course notes available at the course homepage.

6e. Required Books (Textbooks)

- "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition" by Daniel Jurafsky and James H. Martin.

6f. Recommended Books

- "Modern Information Retrieval: The Concepts and Technology behind Search" by Ricardo Baeza-Yates and Berthier Ribeiro-Neto.

6g. Web Sites

- Course homepage is accessed from the FCI website: http://www.aun.edu.eg/Courses/

14. Facilities Required for Teaching and Learning

- A lecture hall equipped with projectors and computers.
- Labs equipped with computers and Internet facilities.
- A library.

Course Coordinator: Dr. Mustafa Kaml

Signature:

Date: 1/9/2023

Department Head: Prof. Dr. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2023

Information Systems Program

Course Matrix

Course Name:	Elective Course III (Intelligent Information Retrieval Systems)	**Course Code:**	IS601

No	**Course Content**	**Teaching Weeks**	**ILOs**				**Teaching and Learning Methods**	**Assessment Tools**	**Criteria**
			a's	**b's**	**c's**	**d's**	**Lectures**	**Final Exam**	
1	Understand and Explore Retrieval Models and Algorithms.	3	1-2	1	□	4	✓	✓	Student evaluation, course file, exam results
2	Analyze Information Organization and Retrieval.	2.5	1	□	1	1-4	✓	✓	
3	Examine Advanced IR Topics and Technologies.	3	□	6-7	1-2	□	✓	✓	
4	Evaluate Information Retrieval Systems.	2.5	8	1-7	2	□	✓	✓	
5	Explore Applications of Natural Language Processing in IR.	2	4-6	□	□	8-10	✓	✓	

Course Coordinator	Prof.Dr. Taysir H. Abdel-Hamid	Department Head	Prof.Dr. Taysir H. Abdel-Hamid

Seminar Specification

IS Master Program

Seminar Specifications

Relevant program	Master in Computers and Information (Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	1st Year
Date of specification approval	1/9/2021

A. Basic Information

1. **Title:** Seminar

B. Professional Information

1. Overall aims of the seminar

Upon attending the seminar, the student will have learned, through appropriate discussion, the following.

- Read ana analyze research papers in some trending topics.
- Summarize important information in research papers.
- Search and find the most appropriate research papers.
- Integrate information and conduct state of the art review and survey paper.

2. Intended Learning Outcomes (ILOs) of the course

a. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. List theories and fundamentals in information systems and related domains.

a2. Describe effective exchange between professional practices and their reflection on the environment.
a3. Describe and apply scientific development in information systems.
a5. Deploy Quality principles of professional practice in information systems.
a6. Apply the fundamentals of scientific research and its ethics.
a7. Locate and classify organization architecture and role of information systems in organizations.
a8. Assess the influence of social and political issues in information systems.

b. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b3. Link different knowledge to solve professional problems.
b4. Carry out a research study and write a thesis around a research problem in information systems.
b5. Assess risks in professional practice of information systems.
b6. Plan to develop the performance in information systems.

c. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c1. Master basic and modern professional skills in information systems.
c2. Write and evaluate professional reports.
c3. Evaluate current methods and tools in information systems.

d. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d1. Have self-assessment and identification of personal learning needs.
d2. Use different recourses to obtain information and knowledge.
d3. Propose roles and indicators to evaluate the performance of the others.
d4. Work in a team and lead teams in different professional tracks.
d5. Manage time efficiently.
d6. Practice Long-life self-learning.
d7. Synthesize ideas from multiple sources.
d9. Develop an argument in a coherent and logical manner

3. Teaching and Learning Methods

4a. Discussion
4b. Workshops
4c. Projects
4d. Case Study
4e. Data Collections

4. Student Assessment

5a. Tools

Oral examination	Knowledge and Understanding - Intellectual Skills - General Skills

5. Facilities Required for Teaching and Learning

- Labs equipped with computers and Internet facilities.
- Advanced research labs.
- Discussion rooms.
- Digital library contains links to international journals.
- A library.

Department Head: Prof. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021

Thesis Specification

Thesis Specifications

Relevant program	Master in Computers and Information (Information Systems)
Department offers the program	Information Systems
Department offers the course	Information Systems
Academic year	2nd Year
Date of specification approval	1/9/2021

C. Basic Information

2. **Title:** Master Thesis

D. Professional Information

6. Overall aims of the thesis

Upon completing this thesis, the student will have learned, through appropriate discussion and laboratory experiences, the following.

- Prepare research proposal.
- Contribute something original to the field.
- Apply Ethical issues for the research by the University Ethics Committee.
- The topic matches the student' interests and capabilities.

7. Intended Learning Outcomes (ILOs) of the course

e. Knowledge and Understanding

On successful completion of the program, graduates should be able to:

a1. Recognize effective exchange between professional practices and their reflection on the environment.

a2. Describe scientific development in information systems.

a3. List ethical and legal principles for professional practice in information systems.
a4. Classify quality principles of professional practice in information systems.
a5. Recognize the fundamentals of scientific research and its ethics.

f. Intellectual Skills

On successful completion of this program, graduates should be able to:

b1. Analyze and evaluate the information in the domain of information systems and take references from them for problem solving.
b2. Solve specialized problems without enough inputs.
b3. Link different knowledge to solve professional problems.
b4. Carry out a research study and write a thesis around a research problem in information systems.
b5. Assess risks in professional practice of information systems.
b6. Plan to develop the performance in information systems.
b7. Take professional decisions in different scenarios.

g. Professional and Practical Skills

On successful completion of this program, graduates should be able to:

c4. Master basic and modern professional skills in information systems.
c5. Write and evaluate professional reports.
c6. Evaluate current methods and tools in information systems.

h. General and Transferable Skills

On successful completion of this program, graduates should be able to:

d8. Use the information technology to serve the professional practice.
d9. Have self-assessment and identification of personal learning needs.
d10. Use different recourses to obtain information and knowledge.
d11. Propose roles and indicators to evaluate the performance of the others.
d12. Work in a team and lead teams in different professional tracks.
d13. Manage time efficiently.
d14. Practice Long-life self-learning.
d15. Synthesize ideas from multiple sources.
d9. Develop an argument in a coherent and logical manner

8. Teaching and Learning Methods

4f. Discussion
4g. Workshops
4h. Projects
4i. Case Study
4j. Data Collections

9. Student Assessment

5b. Tools

Oral examination	Knowledge and Understanding - Intellectual Skills - General Skills
Thesis	Knowledge and Understanding - Intellectual Skills -

	Professional Skills - General Skills

10. Facilities Required for Teaching and Learning

- Labs equipped with computers and Internet facilities.
- Advanced research labs.
- Discussion rooms.
- Digital library contains links to international journals.
- A library.

Department Head: Prof. Taysir H. Abdel-Hamid

Signature:

Date: 1/9/2021