

Course specification
(4102 Network Programming)

Faculty:	<i>HICIT- Higher Institute for Computers & Information Technology-El Shorouk Academy</i>
Programme(s) on which the course is given:	Under graduate program in Computer Science
Major or minor element of programme:	Compulsory
Department offering the programme	Department of Computer Science
Department offering the course:	Department of Computer Science
Year / Class	4 th Year – 1 st semester
Date of specification approval	1/8/2022

A- Basic Information

Title: Network Programming	Code: 4102
Weekly Hours:	
Lecture : 3	Exercise: -
Practical :3	Total: 6

B- Professional Information

1- Course Objectives:

Network programming basic concepts; Java I/O streams; Internet addressing; the Socket class; the Datagram Socket class; Communication primitives; protocol specification, design, and implementation; multithreaded client/server applications; Java network programming API will be used to implement some practical networking aspects.

2- Program ILOs Covered by Course

Program Intended Learning Outcomes			
Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
A2, A6, A13, A14, A20	B3, B4, B18	C1, C2, C5, C7, C8, C10, C16	D5

2 - Intended learning outcomes of course (ILOs)

After completing this course, the student should be able to:

a: Knowledge and Understanding

- a1) Define the basic concepts associated with network programming.[A2,A6,A13]
- a2) Define the role of a protocol in controlling the communication between hosts in a network [A6]
- a3) Clarify the advantages of multithreaded applications [A2,A13,A14,A20]

b: Intellectual skills

- b1) distinguish between transport layer protocols.[B3,B4]
- b2) recognize the significance of flexibility, extendibility, simplicity, and efficiency in protocol design and implementation [B4,B18]

c: Professional and practical skills

- c1) Practice Java I/O streams and Java exception handling primitives[C1, C5,C7,C16]
- c2) implement practical network protocols, for clients and servers, using Java networking API [C2,C8,C10,C16]

d: General and transferable skills

- d1) write a technical report.[D5]
- d2) work with a team to implement a network programs[D5]

3- Contents

Topic	Hours	Lecture	Practical
Network Basics	6	3	3
Basic Web Concept	6	3	3
Basic Web Concept	6	3	3
Java Overview(Streams)	6	3	3
Java Overview(Threading)	6	3	3
Internet Addressing	6	3	3
Socket Programming.	6	3	3
Socket Programming(TCP/IP)	6	3	3
Socket Programming(UDP)	6	3	3
PHP(Basics)	6	3	3
PHP(GUI)	6	3	3
PHP(MYSQL)	4	2	2
Selected Topics	2	2	-
Course Project	6	3	3

4 -Teaching and learning methods

Teaching and learning methods	Used
Active Learning	
Lectures(blending learning – online learning using virtual classroom)	√

Tutorial Exercises (hybrid learning – online learning)	√
Practical Lab(blending learning– online learning)	√
Exercises	
Discussions.	√
Self – Learning strategy	
Reading material	√
Websites search	√
Research and reporting	√
Self-studies	
Experimental strategy	
Group work	√
Presentation	√
Problem solving strategy	
Problem solving/problem solving learning based	√
Case study	-
Synchronous E-Learning	
Virtual lab	-
Virtual class	-
Chat Room	√
Video lectures	
Asynchronous E-Learning	
E-Learning	√

5 -Student assessment methods

Methods	Assessment	Used
Electronic Midterm Exam	To assess the knowledge and understanding achieved by the student during the previous weeks. (online on e-learning hub)	√
Pencil-to-Paper Final Exam	To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.	√
Course Project	To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills. (online on e-learning hub , FTF)	√
Electronic Course Work & Quizzes	To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.(online on e-learning hub)	√
Practical Exam	to measure the ability of students to design and implement a software program(FTF).	—
Participation	To assess the knowledge and understanding achieved by the student during the previous weeks.	√

Assessment Schedule

Assessment	Week #
Participation	3-14
Electronic Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work & Quizzes	2-14

Assessment Weight

Assessment	Weigh %
Participation	5%
Electronic Mid Term Exam	
Final Exam	80%
Course Project	10%
Course Work & Quizzes	5%
Total	100

Course Work & Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

6 -List of references

Essential books (text books)	<ul style="list-style-type: none"> - Harold, E. R. (2013, October 29). <i>Java Network Programming: Developing Networked Applications</i>. - Reilly, D., & Reilly, M. (2002). <i>Java™ Network Programming and Distributed Computing</i>. Addison-Wesley. - Comer, D. E. (2000, April 1). <i>Internetworking with TCP/IP: Principles, Protocols, and Architecture</i>. https://doi.org/10.1604/9780130183804 - Black, U. D. (1998, January 1). <i>Tcp/Ip and Related Protocols</i>. https://doi.org/10.1604/9780585234229
Recommended books	<ul style="list-style-type: none"> - Edelman, J., Lowe, S. S., & Oswalt, M. (2018, March 3). <i>Network Programmability and Automation: Skills for the Next-Generation Network Engineer</i>.

Periodicals,website	Powerpoint presentations of all course materials All labs material [https://moodle.sha.edu.eg/course/view.php?id=1369]
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7- Required Facilities

To assess professional and practical skills given the following facilities:

a- Tools/Software

- NetBeans
- XAMPP(PHP Server)
- visual studio code
- **portal(MOODLE) to make electronic quizzes and electronic midterm exam**
- **portal(MOODLE) to upload project deliverable and assignment**
- **academy portal(MOODLE) to upload electronic material**

b- Teaching facilities:

	<i>Lecture</i>	<i>class</i>	<i>Lab</i>
Whiteboard	Used	-	Used
Pc/laptop	Used	-	Used
Data show	Used	-	Used
Webinars	MS TEAMS	-	MS TEAMS
SocialMedia	Facebook Page for 4 th year	-	Facebook Page for 4 th Year
ChatRoom	ChatTeams	-	ChatTeams
Videos	-	-	-
Website	MOODLE	-	MOODLE

8- Course Matrices

8.1-Course Content/ILOs Matrix

Course Contents	Knowledge & understanding			Intellectual skills		Professional and practical skills		General	
	a1	a2	a3	b1	b2	c1	c2	d1	d2
Network Basics	√	√		√					
Basic Web Concept	√	√		√					
Basic Web Concept	√	√		√					
Java Overview(Streams)	√	√				√			
Java Overview(Threading)	√	√	√			√			
Java Overview(Threading)	√	√	√			√			
Internet Addressing	√				√	√	√		
Socket Programming.	√				√	√	√		
Socket Programming(TCP/IP)	√				√	√	√		
Socket Programming(UDP)	√				√	√	√		
PHP(Basics)						√	√		
PHP(GUI)						√	√		

PHP(MYSQL)						√	√		
Selected Topics	√				√				
Course Project								√	√

8.2- Learning Method /ILOs Matrix

Learning Methods	Knowledge and understanding			Intellectual skills		Professional and practical skills		General	
	a1	a2	a3	b1	b2	c1	c2	d1	d2
Lectures	x	x	x	x	x	x	x		
Tutorial Exercises				x	x	x	x		
Reading material	x	x	x	x	x	x	x		
Websites search	x	x	x	x	x		x	x	x
Research and reporting	x	x	x					x	x
Problem solving/problem solving learning based									
Group work						x	x	x	x
Presentations									
Practical Lab									
Discussions.				x	x	x	x	x	x

8.3-Assessment Methods /ILOs Matrix

Assessment Methods	Knowledge & understanding			Intellectual skills		Professional & practical skills		General	
	a1	a2	a3	b1	b2	c1	c2	d1	d2
Electronic Mid Term Exam	√	√	√	√	√	√	√		
Final Exam	√	√	√	√	√	√	√		
Electronic Course Project	√	√	√	√	√	√	√	√	√
Electronic Course Work & Quizzes	√	√	√	√	√	√	√	√	√

9. Course ILOs Vs Program ILOs

Course ILOs \ Prog ILOs		Knowledge & understanding					Intellectual skills			Professional and practical skills						General	
		A2	A6	A13	A14	A20	B3	B4	B18	C1	C2	C5	C7	C8	C10	C16	D5
K&U	a1	√	√	√													
	a2		√														
	a3	√		√	√	√											
Int.	b1						√	√									
	b2							√	√								
P. & P.	c1									√		√	√			√	
	c2										√			√	√	√	
General	d1																√
	d2																√

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Head of Department: Prof. Dr. Ahmed El-Abbassy ()
Date: 1/8/2022