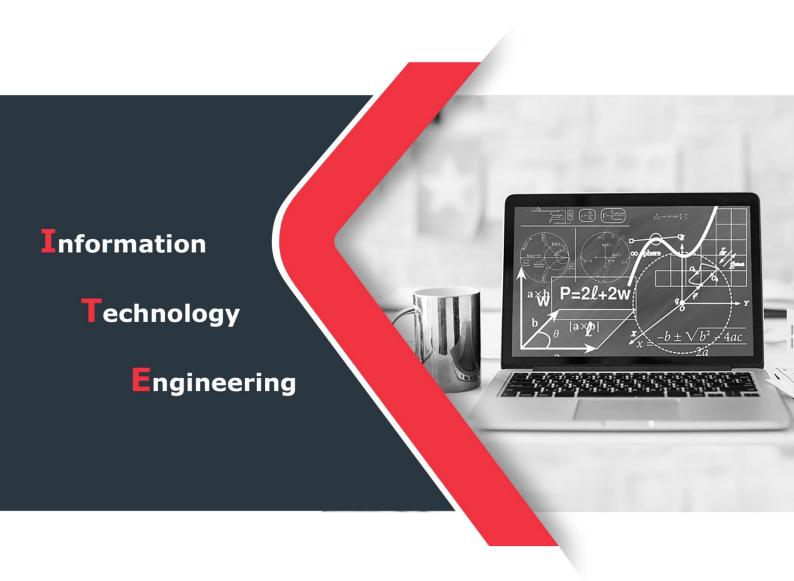


# Course definition

Network Application Programming





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#### 1. Basic Information:

Course Name	Network Application Programming
Course ID	NNP601
No. of Recorded Sessions*	12
No. of Synchronized Sessions*	18
No. of Quizzes (hrs.)	
Exam (hrs.)	
Registered Sessions Work Load (hrs.)	36
Synchronized Sessions Work Load (hrs.)	36
Credit Hours	6

<sup>\*</sup> The duration of each session 1.5 hr

#### 2. Pre-Requisites:

Course	ID
Programming (2)	BPG402
Computer Networks (1)	BNT501
Intelligent algorithms	BIA601

## 3. Course Objectives:

The course aims to introduce some network application programming techniques such as Threads and their use in programming multi-threading applications, client-server applications programming, and RPC technology, in addition to the ability to deal with AAA servers and programming within the Internet.

In particular, the student will be able to:

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- 1. Understand the basic concepts of threads and the associated technologies for programming multithreading applications.
- 2. Understand the basic concepts of client/server applications and associated technologies and protocols.
- 3. Introducing RPC, SOAP and REST techniques and how to benefit from them.
- 4. Understand the basic concepts of web services and associated technologies for programming multiple web applications.

### 4. Learning Outcomes (LO):

By the end of this course the learner is expected to:

- Have an overview of how to program client-server applications.
- Possess the ability to raise the performance of network work through the use of embedding techniques.
- Understand how to do HTTP programming for the Internet.
- Process, design and understand mail and file transfer software on networks.
- understand how to program Internet applications.

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## 5. Assessment Results:

			Assessment Type				
Chapter No.	Chapter Title	Intended Objectives	Develope d content/ Recorded Sessions	Practical Activities (Synchronize d Sessions)	Quizzes and Exams	Presen tations And Intervie ws	Reports
CH1		Comprehensi					
	Multithreading	on	X	X	X		
	J	-Analytical					
		Thinking					
CH2	Client/server network application programming	on -Analytical Thinking - Tools And Application Hands- On	X	X	X		X
CH3	Web services	Comprehensi on -Analytical Thinking - Tools And Application Hands- On	X	X	X		X

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# 6. Course Syllabus

Chapter No.	Chapter Title	Chapter Content (Syllabus)	No. of Theoret ical Learnin g Units	No. of Practical Learning Units)
CH1	Multithreading	<ul> <li>Thread States: Life Cycle of a Thread</li> <li>Thread Priorities and Scheduling</li> <li>Creating and Executing Threads</li> <li>Thread Synchronization</li> <li>Producer/Consumer Relationship without Thread Synchronization</li> <li>Producer/Consumer Relationship with Thread Synchronization</li> <li>Producer/Consumer Relationship Circular Buffer</li> <li>Multithreading in GUIs</li> </ul>	4	4
CH2	Client/server network application programming	<ul> <li>Connection Oriented vs. Connectionless         Communication</li> <li>Data transfer protocols</li> <li>Building TCP server using stream sockets</li> <li>Building TCP client using stream sockets</li> <li>Client/server interaction using stream sockets communication</li> <li>Connectionless Client/Server Interaction with Datagrams</li> <li>Building client/server application using multithreading server</li> <li>Web browser</li> </ul>	4	4

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		•	Remote networking		
		•	Web services		
		•	Simple Object Access Protocol (SOAP)		
СНЗ	Web services	•	Publishing and Consuming Web Services	4	4
		•	Using web services within web forms		
		•	Defined types within web services		

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# 7. Practical Activity:

Tools and Labs:

Tool Name	Description
Visual studio .Net	Programming framework

## • Practical Activities per Chapters:

Chapter	Practical Activity	Remarks
CH1	<b>▼</b> Exercises	
	<b>▼</b> Homework	
	□ Webinars	
	□ Project	Homework
	□ Experiment	
	□ Other	
CH2	<b>▼</b> Exercises	
	<b>▼</b> Homework	
	□ Webinars	Homework
	□ Project	
	☐ Experiment	
	□ Other	
CH3	<b>▼</b> Exercises	
	<b>▼</b> Homework	
	Webinars	Homework

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□ Project		

□ Project	
☐ Experiment	
□ Other	

#### • References:

- Wang, K. C. Systems Programming in Unix/Linux. Springer, 2018.
- Edelman, Jason, Scott S. Lowe, and Matt Oswalt. *Network Programmability and Automation: Skills for the Next-Generation Network Engineer.* "O'Reilly Media, Inc.", 2018.
- Meier, Burkhard A. Python GUI Programming Cookbook. Packt Publishing Ltd, 2017