

# INFORMATION AND COMMUNICATION TECHNOLOGY (SOFTWARE DEVELOPMENT) - BACHELOR OF INFORMATION AND COMMUNICATION TECHNOLOGY

## (120 credits)

The Bachelor of Information and Communication Technology (ICT) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- **No Concentration** - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- **Cyber Defense Concentration** - focused on cyber security and defense, including ethical hacking and digital forensics;
- **Network Technologies Concentration** - focused on computer network design, configuration, and security;
- **Software Development Concentration (this option)** - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office @.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (<https://accreditation.nmsu.edu/>) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

## Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
<b>General Education <sup>1</sup></b>		
<i>Area I: Communications <sup>1</sup></i>		10
	English Composition - Level 1	
	English Composition - Level 2	
	Oral Communications	
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra (Equivalent or Higher) <sup>1</sup>	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences <sup>1</sup></i>		10-11
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences or Area IV: Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities <sup>1</sup></i>		3
<i>Area VI: Creative and Fine Arts <sup>1</sup></i>		3
<i>General Education Elective <sup>1</sup></i>		3-4
<b>Viewing A Wider World <sup>2</sup></b>		<b>6</b>
<b>Departmental/College Requirements</b>		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy <sup>2</sup>	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
<i>Concentration/Technical Electives (take all four courses)</i>		12
E T 483	Mobile App Programming and Development <sup>3</sup>	
ICT 372	Software Engineering and Design <sup>3</sup>	
ICT 458	Web Development and Database Applications <sup>3</sup>	
ICT 460	Advanced Software Development Concepts <sup>3</sup>	
<b>Second Language: (not required)</b>		
<b>Electives, to bring the total credits to 120 <sup>4</sup></b>		<b>19-16</b>
<b>Total Credits</b>		<b>120</b>

<sup>1</sup> See the **General Education** (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

<sup>2</sup> The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) Requirements

(6 credits). Visit the catalog's Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section for a complete list of Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

<sup>3</sup> The **provided selection of Technical Electives** will lead to an ICT concentration on **Software Development**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

<sup>4</sup> **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Concentration/Technical Electives (take all four courses)		12
E T 483	Mobile App Programming and Development <sup>3</sup>	
ICT 372	Software Engineering and Design <sup>3</sup>	
ICT 458	Web Development and Database Applications <sup>3</sup>	
ICT 460	Advanced Software Development Concepts <sup>3</sup>	
<b>Second Language: (not required)</b>		
<b>Electives, to bring the total credits to 120<sup>4</sup></b>		<b>19-16</b>
<b>Total Credits</b>		<b>120</b>

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## Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
<b>General Education<sup>1</sup></b>		
Area I: Communications <sup>1</sup>		10
	English Composition - Level 1	
	English Composition - Level 2	
	Oral Communications	
Area II: Mathematics		3-4
MATH 1220G	College Algebra ((equivalent or higher)) <sup>1</sup>	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences <sup>1</sup>		10-11
Area V: Humanities <sup>1</sup>		3
Area VI: Creative and Fine Arts <sup>1</sup>		3
General Education Elective <sup>1</sup>		3-4
<b>Viewing A Wider World<sup>2</sup></b>		<b>6</b>
<b>Departmental/College Requirements</b>		
Subject-Matter Courses		12
	Introduction to Computer Networking (such as ICT 145)	
	Introduction to Information Technology (such as ICT 161)	
	Introduction to Information Security (such as ICT 267)	
	Introduction to Web Development (such as ICT 280)	
<b>Required Courses</b>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3

## Pathway: 4-yr Bachelor's Degree

### A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous English coursework that was transferred in. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
<b>Fall</b>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course <sup>4</sup>		3
General Education Area I <sup>1</sup>		4
General Education Area II (MATH 1220G or Higher) <sup>1</sup>		3-4
General Education IV <sup>1</sup>		3
<b>Credits</b>		<b>16-17</b>

Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I <sup>1</sup>		3
General Education Area III <sup>1</sup>		4
General Education Area V <sup>1</sup>		3
<b>Credits</b>		<b>16</b>
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I <sup>1</sup>		3
General Education Area VI <sup>1</sup>		3
Elective Course <sup>4</sup>		3
<b>Credits</b>		<b>15</b>
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV <sup>1</sup>		3-4
General Education Elective <sup>1</sup>		3
Elective Course <sup>4</sup>		3
<b>Credits</b>		<b>15-16</b>
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course <sup>4</sup>		3
Elective Course <sup>4</sup>		3
Elective Course <sup>4</sup>		3
<b>Credits</b>		<b>15</b>
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy <sup>2</sup>	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Viewing a Wider World Elective <sup>2</sup>		3
<b>Credits</b>		<b>15</b>
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
E T 483	Mobile App Programming and Development	3
ICT 458	Web Development and Database Applications	3
<b>Credits</b>		<b>15</b>
Spring		
ICT 372	Software Engineering and Design	3
ICT 457	Information Security Principles	3
ICT 460	Advanced Software Development Concepts	3
Viewing a Wider World Elective <sup>2</sup>		3
Electives to bring total to 120 credits (if necessary) <sup>4</sup>		1-0
<b>Credits</b>		<b>13-12</b>
<b>Total Credits</b>		<b>120-121</b>

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## Pathway: 2+2 Bachelor's Degree

First Year		Credits
Elective Credits (include General Education credits) <sup>4</sup>		30
<b>Credits</b>		<b>30</b>
Second Year		
Elective Credits (include General Education credits) <sup>4</sup>		33
<b>Credits</b>		<b>33</b>
Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
<b>Credits</b>		<b>15</b>
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Viewing a Wider World Elective <sup>2</sup>		3
<b>Credits</b>		<b>15</b>

**Fourth Year****Fall**

E T 483	Mobile App Programming and Development <sup>3</sup>	3
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 458	Web Development and Database Applications <sup>3</sup>	3

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**Credits** **15**

**Spring**

ICT 372	Software Engineering and Design <sup>3</sup>	3
ICT 457	Information Security Principles	3
ICT 460	Advanced Software Development Concepts	3
Viewing a Wider World <sup>2</sup>		3

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**Credits** **12**

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**Total Credits** **120**

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