Institute of Mathematics and Computer Sciences

Course: Bachelor's Degree in Computer Science

Basic Curriculum Information

Start Date: 01/01/2025 Duration 10 semesters Minimum 8 semesters

Maximum 15 semesters

Workload (Hours)	Lecture	Practical	Subtotal	
Mandatory Courses	2205	1920	4125	
Free Electives	0	0	0	
Elective Courses	450	0	450	
Total workload from coursework	2655	1920	4575	(Internship: 600) (AAC: 90) (AEX Apolo and/or electives: 242

Overall total workload required in extension courses:

491 (10.01%)

Overall Total (*Total workload in subjects from the curriculum + AAC + AEX Apolo and/or electives): 4907

Specific Information

Approval of the Transfer of Modality by the University Council in a session on 07/17/1979. Recognized by MEC Ordinance No. 138, of 02/11/1981, DOE 02/13/1981. Recognition renewed for 5 years by CEE/GP Ordinance No. 457/2019, of 10/29/2019, DOE 10/30/2019.

To enroll in the courses related to Supervised Internship (SCC0291 and SCC0292), Graduation Project (SCC0293 and SCC0294), or Exchange Project (SCC0289 and SCC0290), the student must have completed at least 100 lecture credits in mandatory and elective courses of the

Elective courses aim to provide students with a broader understanding and deeper knowledge in one or more areas of computing. Students may choose to focus on specific fields within their

A maximum of 10 elective lecture credits, provided they do not have similar content to mandatory courses, may be counted towards the elective course credit requirements.

The special study certificates currently recommended at ICMC reflect the areas of excellence in computing from the Departments of Computer Science and Computer Systems. These special studies aim to guide a more coherent choice of elective courses, and the selection of elective courses to be offered is mainly determined by students in their fourth year.

The currently available special study certificates are in the following areas:

Web Development

SCC0260 Human-Computer Interaction SCC0261 Multimedia

SCC0280 Accessibility in Computational Systems

SCC0282 Information Retrieval

SCC0283 Introduction to the Semantic Web SCC0225 Mobile Application Development Laboratory

SCC0303 - Introduction to Data Compression

-> Minimum of 4 courses required

Data Engineering

SCC0243 Architecture of Database Management Systems

SCC0244 Mining from Large Databases

SCC0245 Analytical Data Processing SCC0246 Content-Based Data Retrieval

SCC0251 Image Processing

SCC0252 Computational Visualization -> Minimum of 4 courses required

Software Engineering SSC0721 or SSC0959 Software Testing and Inspection

SSC0725 Software Architecture

SSC0726 Software Reuse

SSC0128 Onlyware Recise SSC0128 Project Management or SEP0172 Practice and Project Management SSC0723 Collaborative Systems: Foundations and Applications

SCC0260 Human-Computer Interaction

SCC0209 IT Entrepreneurship

-> Minimum of 4 courses required

Artificial Intelligence

SCC0282 Information Retrieval

SCC0284 Recommender Systems

SCC0286 Mining Complex Networks

SCC0287 Mining Unstructured Data SCC0633 Natural Language Processing

^{*} Internship and extension activity hours included in mandatory courses are already factored into the Total workload.

SCC0233 Machine Learning Applications and Data Mining

SCC0270 Neural Networks and Deep Learning

SCC0276 Machine Learning SCC0370 Introduction to Bio-Inspired Computing

-> Minimum of 4 courses required

Robotics

SCC0251 Image Processing SCC0273 Intelligent Mobile Robots SSC0712 Mobile Robot Programming

SSC0714 Autonomous Mobile Robots

SSC0713 Evolutionary Systems and Robotics Applications

SSC0715 Intelligent Sensors
-> Minimum of 4 courses required

Advanced and High-Performance Computing Systems

SSC0158 Cloud Computing and Service-Oriented Architectures

SSC0159 Advanced Topics in High-Performance Computing

SSC0160 Computational Systems Modeling and Simulation SSC0950 System Software Development

SSC0951 Optimized Code Development

SSC0952 Internet of Things SSC0953 Open Source Systems

SSC0954 High-Performance and Distributed Computing Infrastructure

-> Minimum of 4 courses required

Embedded Systems

SSC0740 Embedded Systems SSC0720 Software Engineering for Embedded Systems SSC0741 Embedded Systems Design and Implementation I

SSC0721 Software Testing and Inspection

SSC0746 Fault-Tolerant Computing Systems SSC0745 Real-Time Computing Systems

-> Minimum of 4 courses required

Advanced Programming Techniques

SCC0210 Advanced Algorithms Lab I SCC0211 Advanced Algorithms Lab II SCC0220 Introduction to Computer Science II Lab

SSC0951 Optimized Code Development

-> Minimum of 4 courses required

Data Science Emphasis for courses at ICMC

The courses are organized within two groups:

SCC0276 Machine Learning

SCC0270 Neural Networks and Deep Learning SCC0244 Mining Large Databases

SCC0251 Image Processing

SCC0252 Computational Visualization SCC0275 Introduction to Data Science

Group 2 includes:

SME0806 Computational Statistics

SME0822 Multivariate Analysis and Unsupervised Learning

SME0878 Statistical Data Mining SME0823 Regression Models and Supervised Learning II SME0808 Time Series and Dynamic Learning

SME0130 Complex Networks

To obtain the certificate, students must complete 6 courses, selecting 3 from Group 1 and 3

In addition to the credits from mandatory and elective courses, students must complete:

- at least 90 hours (3 practical credits) of Complementary Academic Activities (AACs), which will be recorded on their transcript.
- Students must also fulfill extension activities corresponding to 10% of the total curriculum workload, in compliance with the National Education Plan (PNE), as regulated by CNE/CES Resolution No. 7/2018 and CEE Deliberation 216/2023.

Curriculum

Legend: CH = Total Course Load; CE = Internship Course Load; CP = Course Load for Practical Activities as Curricular Components; ATPA = Course Load for Theoretical-Practical Deepening Activities; EXT = Course Load for Extension Activities

Mandatory Courses

SMA0353 - Calculus I

1º Ideal Period		Cred. Lect.	Cred. Pract.		СН	CE	СР	ATPA	EXT
SCC0200	Professional Information and Mentoring on Computer Science		2	0	30				
SCC0221	Introduction to Computer Science I		4	1	90				10
SCC0222	Introduction to Computer Science: Laboratory Practice I		2	2	90				
SMA0300	Analytic Geometry		4	0	60				
SMA0353	Calculus I		4	0	60				
SSC0104	Computing History, Evolution and Applications		2	1	60				30
SSC0109	Introduction to Digital Logic: Laboratory Practice		2	1	60				
SSC0117	Introduction to Digital Logic		2	1	60				
SSC0180	Electronics for Computer Sciences		2	2	90				10
		Subtotal:	24	8	600				50
2º Ideal Period		Cred. Lect.	Cred. Pract.		СН	CE	СР	ATPA	EXT
7600105	Basic Physics I		4	0	60				

Weak Requirement

SCC0201 Introduction to Computer Science II SCC0221 - Introduction to Computer Science I SCC0202 Algorithms and Data Structures I		4	2 120 Weak Requirement 2 120			5
SCC0201 - Introduction to Computer Science II SMA0180 Discrete Mathematics I SMA0354 Calculus II SMA0353 - Calculus I		4	Set Indication 0 60 0 60 Weak Requirement			
SSC0108 Digital Systems: Laboratory Practice SSC0118 - Digital Systems SSC0118 Digital Systems		2	1 60 Set Indication 1 60			15
SSC0117 - Introduction to Digital Logic	Subtotal:	24	Weak Requirement 6 540			20
3º Ideal Period	Cred. Lect.	Cred. Pract.	CH CE	СР	ATPA	EXT
7600109 General Physics Laboratory I		2	0 30			
7600105 - Basic Physics I SCC0215 File Organization		3	Weak Requirement 2 105			
SCC0202 - Algorithms and Data Structures II		· ·	Weak Requirement			
SCC0201 - Introduction to Computer Science II			Weak Requirement			
SCC0216 Computational Modelling in Graphs SCC0202 - Algorithms and Data Structures I		2	1 60 Weak Requirement			
SMA0355 Calculus III		4	0 60			
SMA0354 - Calculus II			Weak Requirement			
SSC0103 Object-Oriented Programming SCC0202 - Algorithms and Data Structures I		2	1 60 Weak Requirement			
SSC0902 Organization and Architecture of Computers		4	1 90			15
SSC0118 - Digital Systems			Weak Requirement			
SC0960 Functional Programming SCC0202 - Algorithms and Data Structures I		2	1 60 Weak Requirement			
2000202 Augustinis and Data Statelares i	Subtotal:	19	6 465			15
4º Ideal Period	Cred. Lect.	Cred. Pract.	CH CE	СР	ATPA	EXT
SCC0218 Advanced Algorithms and Applications	Lect.	2	2 90			5
SCC0216 - Computational Modeling in Graphs			Weak Requirement			
SME0123 Statistics		4	0 60			
SMA0354 - Calculus II SME0142 Linear Algebra and Applications		4	Weak Requirement 1 90			
SSC0124 Object-Oriented Analysis and Design		2	1 60			15
SSC0103 - Object-Oriented Programming			Weak Requirement			
SCC0140 Operating Systems I SCC0202 - Algorithms and Data Structures I		4	2 120 Weak Requirement			30
SSC0902 - Computer Organization and Architecture			Weak Requirement			
	Subtotal:	16	6 420			50
5º Ideal Period	Cred. Lect.	Cred. Pract.	CH CE	СР	ATPA	EXT
SCC0219 Introduction to Web Development		Pract.	1 90	СР	ATPA	EXT 10
SCC0219 Introduction to Web Development SCC0240 Databases		Pract.	1 90 2 120	СР	ATPA	
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization		Pract.	1 90	СР	ATPA	
SCC0219 Introduction to Web Development SCC0240 Databases		Pract. 4 4	1 90 2 120 Weak Requirement	СР	ATPA	
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications		Pract. 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement	СР	ATPA	
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I		Pract. 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 0 60	СР	ATPA	
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes		Pract. 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement	СР	ATPA	
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design		Pract. 4 4 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement	СР	АТРА	10
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks		Pract. 4 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 2 120	СР	АТРА	10
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SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks	Lect.	Pract. 4 4 4 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 2 120 Weak Requirement	СР	АТРА	15 30
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I	Lect. Subtotal: Cred.	Pract. 4 4 4 4 4 Cred.	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 2 120 Weak Requirement 6 540 CH CE 2 120			15 30 55
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SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I	Lect. Subtotal: Cred.	Pract. 4 4 4 4 4 24 Cred. Pract.	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 2 120 Weak Requirement 6 540 CH CE 2 120			10 15 30 55
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I 6º Ideal Period SCC0205 Theory of Computation and Formal Languages SCC0201 - Introduction to Computer Science II SCC0207 Computers and Society I SCC0230 Artificial Intelligence SCC0201 - Introduction to Computer Science II	Lect. Subtotal: Cred.	Pract. 4 4 4 4 24 Cred. Pract. 4 2 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 1 90 Weak Requirement 2 120 Weak Requirement 6 540 CH CE 2 120 Weak Requirement 0 30 1 90 Weak Requirement			15 30 55 EXT 10
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SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I 6º Ideal Period SCC0205 Theory of Computation and Formal Languages SCC0201 - Introduction to Computer Science II SCC0207 Computers and Society I SCC0230 Artificial Intelligence SCC0201 - Introduction to Computer Science II	Lect. Subtotal: Cred.	Pract. 4 4 4 4 24 Cred. Pract. 4 2 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement Weak Requirement 1 90 Weak Requirement 2 120 Weak Requirement 6 540 CH CE 2 120 Weak Requirement 0 30 1 90 Weak Requirement			15 30 55 EXT 10
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SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I 6º Ideal Period SCC0205 Theory of Computation and Formal Languages SCC0201 - Introduction to Computer Science II SCC0230 Artificial Intelligence SCC0201 - Introduction to Computer Science II SME0110 Mathematical Programming SME0104 - Numerical Analysis SSC0903 High-Performance Computing	Subtotal: Cred. Lect.	Pract. 4 4 4 4 24 Cred. Pract. 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 1 2 120 Weak Requirement 6 540 CH CE 2 120 Weak Requirement 0 30 1 90 Weak Requirement 2 120 Weak Requirement 1 90 Weak Requirement Weak Requirement			15 30 55 EXT 10
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I 6º Ideal Period SCC0205 Theory of Computation and Formal Languages SCC0201 - Introduction to Computer Science II SCC0207 Computers and Society I SCC0230 Artificial Intelligence SCC0201 - Introduction to Computer Science II SME0110 Mathematical Programming SME0104 - Numerical Analysis SSC0903 High-Performance Computing SSC0902 - Computer Organization and Architecture	Lect. Subtotal: Cred.	Pract. 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 2 120 Weak Requirement 6 540 CH CE 2 120 Weak Requirement 0 30 1 90 Weak Requirement 2 120 Weak Requirement 1 90 Weak Requirement 1 90 Weak Requirement			15 30 55 EXT 10
SCC0219 Introduction to Web Development SCC0240 Databases SCC0215 - File Organization SME0104 Numerical Analysis SMA0353 - Calculus I SME0142 - Linear Algebra and Applications SME0121 Stochastic Processes SME0123 - Statistics SSC0130 Software Engineering SSC0124 - Object-Oriented Analysis and Design SSC0142 Computer Networks SSC0140 - Operating Systems I 6º Ideal Period SCC0205 Theory of Computation and Formal Languages SCC0201 - Introduction to Computer Science II SCC0207 Computers and Society I SCC0230 Artificial Intelligence SCC0201 - Introduction to Computer Science II SME0110 Mathematical Programming SME0104 - Numerical Analysis SSC0903 High-Performance Computing SSC0902 - Computer Organization and Architecture	Subtotal: Cred. Lect. Subtotal: Cred.	Pract. 4 4 4 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4	1 90 2 120 Weak Requirement 0 60 Weak Requirement 0 60 Weak Requirement 1 90 Weak Requirement 1 2 120 Weak Requirement 6 540 CH CE 2 120 Weak Requirement 0 30 1 90 Weak Requirement 2 120 Weak Requirement 1 90 Weak Requirement Weak Requirement			15 30 55 EXT 10
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SCC0250	Distributed Computing Systems ing Systems I	Subtotal:		4 2 2 2	1 Weak 1 Weak 1 Weak 1 Weak	Require 90 Require 60 Require 60 Require 60 Require Require Require 390	ement			15
9º Ideal Period SCC0291	Supervised Internship I		Cred. Lect.	Cred. Pract. 4	10 10	360 360	CE 300 300	СР	ATPA	EXT
10º Ideal Period SCC0292 SCC0291 - Superv	Supervised Internship II rised Internship I		Cred. Lect.	Cred. Pract. 4	10	360 uirement 360	CE 300	СР	ATPA	EXT
Elective Courses 2º Ideal Period SCC0220 SCC0201 - Introdu	Laboratory of Introduction to Computer Science II ction to Computer Science II		Cred. Lect.	Cred. Pract.	0	CH 60 ndication	CE	СР	ATPA	EXT
SSC0119 SSC0112 - Digital or	Introduction to Data Compression rms and Data Structures I Practice in Computer Organization Computer Organization I rter Organization and Architecture		Cred. Lect.	Cred. Pract. 2	1 Requ 1 Set Ir	60 irement 60 ndication	CE	СР	ATPA	EXT
4º Ideal Period SCC0213 SCC0227 SCC0295	Research Methodology in Computing Seminars in Computing I Academic Extension Activities I			Cred. Pract. 2 1	2 0 2	90 15 75	CE	СР	ATPA	EXT 10 75
	Laboratory of Advanced Algorithms I ction to Computer Science II nms and Data Structures I Computing Seminars II sting Seminars I Academic Extension Activities II Open Source Systems			Cred. Pract. 3	2 Weak Weak	105 Require Require 15 Require 75 90	ment	СР	АТРА	EXT 10 75
SCC0229 SCC0228 - Compu SCC0247 SCC0240 - Databa SSC0770	NoSQL Databases and Distributed Processing Frameworks uses Introduction to Game Development Oriented Programming Infrastructure for High-Performance Computing and Distributed Systems			Cred. Pract. 3 1 4 4	2 Weak 0 Weak 2 Weak 2 Weak 2 Weak 2	105 c Require 15 c Require 120 c Require 120 c Require 120 c Require 90 c Require	ement	СР	АТРА	EXT 10
•	Architecture of Database Management Systems ases Analytical Data Processing			Cred. Pract. 4 4 4 4	1 2 Weak 2 Weak 2 Weak 1 Weak	90 120 k Require 120 k Require 105 k Require k Require k Require	ment ment ment	СР	АТРА	10 30 10

SCC0260 Human-Computer Interaction and User Experience	4	4 00	4.0
	4	1 90	10
SSC0103 - Object-Oriented Programming		Weak Requirement	
SCC0261 Multimedia	2	0 30	
SCC0201 - Introduction to Computer Science II		Weak Requirement	
SCC0270 Neural Networks and Deep Learning	4	1 90	10
SCC0230 - Artificial Intelligence		Weak Requirement	
SCC0276 Machine Learning	4	1 90	10
SCC0230 - Artificial Intelligence		Weak Requirement	
SCC0282 Information Retrieval	2	1 60	10
SCC0202 - Algorithms and Data Structures I	_		10
· · · · · · · · · · · · · · · · · · ·	A	Weak Requirement	10
SCC0284 Recommender Systems	4	1 90	10
SCC0202 - Algorithms and Data Structures I		Weak Requirement	
SCC0370 Introduction to Bio-Inspired Computing	2	1 60	
SCC0215 - File Organization		Weak Requirement	
SCC0216 - Computational Modeling in Graphs		Weak Requirement	
SCC0633 Natural Language Processing	4	1 90	10
SCC0230 - Artificial Intelligence		Weak Requirement	
SCC0910 Advanced Topics in Computer Science I	3	2 105	
SME0130 Complex Networks	4	2 120	
SMA0353 - Calculus I	7		
		Weak Requirement	
SCC0216 - Computational Modeling in Graphs		Weak Requirement	
SME0806 Computational Statistics	4	2 120	
SME0123 - Statistics		Weak Requirement	
SSC0141 Operating Systems Practice	4	2 120	
SSC0140 – Operating Systems I		Weak Requirement	
SSC0147 Special Topics in Computing Systems I	3	0 45	
SSC0154 Advanced Seminars in Distributed Systems and Concurrent Programming I	3	0 45	
SSC0140 - Operating Systems I	0	Weak Requirement	
	2		20
SSC0158 Cloud Computing and Service-Oriented Architecture	2	1 60	30
SCC0202 - Algorithms and Data Structures I		Weak Requirement	
SSC0140 - Operating Systems I		Weak Requirement	
SSC0142 - Computer Networks		Weak Requirement	
SSC0160 Modeling and Simulation of Computer Systems	3	2 105	
SCC0202 - Algorithms and Data Structures I		Weak Requirement	
SSC0140 - Operating Systems I		Weak Requirement	
	3	3 120	10
SSC0712 Mobile Robots Programming	2		10
SSC0714 Autonomous Mobile Robots	2	2 90	
SSC0723 Collaborative Systems: Fundamentals and Applications	2	0 30	
SCC0201 - Introduction to Computer Science II		Weak Requirement	
SSC0725 Software Architecture	2	2 90	
SSC0124 - Object-Oriented Analysis and Design			
		Weak Requirement	
	3	Weak Requirement 2 105	
SSC0740 Embedded Systems	3	2 105	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture		2 105 Weak Requirement	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development	3	2 105 Weak Requirement 2 90	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I	2	2 105 Weak Requirement 2 90 Weak Requirement	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code		2 105 Weak Requirement 2 90 Weak Requirement 2 90	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture	2	2 105 Weak Requirement 2 90 Weak Requirement	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code	2	2 105 Weak Requirement 2 90 Weak Requirement 2 90	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture	2	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II	2	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection	2	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement 1 60	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection	2 2 2	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement 1 60	
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering	2 2 2 Cred. Cred.	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement 1 60 Weak Requirement	CP ATPA EXT
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering	2 2 2 Cred. Cred. Lect. Pract.	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement 1 60 Weak Requirement	CP ATPA EXT
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SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0103 - Object-Oriented Programming	2 2 Cred. Cred. Pract.	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement 1 60 Weak Requirement CH CE 1 90 Weak Requirement	CP ATPA EXT
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SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SC0901 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0103 - Object-Oriented Programming SCC0231 Introduction to Intelligent Systems SC0233 Applications of Machine Learning and Data Mining	2 2 Cred. Cred. Pract.	2 105 Weak Requirement 2 90 Weak Requirement 2 90 Weak Requirement Weak Requirement 1 60 Weak Requirement CH CE 1 90 Weak Requirement 1 75 Weak Requirement 2 90	CP ATPA EXT
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SSC0902 - Computer Organization and Architecture SSC0950	2 2 2 Cred. Cred. Pract. 4 3 2 3 4 2 2 4	Weak Requirement 90 Weak Requirement 90 Weak Requirement Weak Requirement 1 60 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 1 75 Requirement 2 120 1 60 Weak Requirement Weak Requirement 1 60 Weak Requirement 1 60 Weak Requirement 1 90 0	CP ATPA EXT
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SSC0902 - Computer Organization and Architecture SSC0950	2 2 Cred. Cred. Pract. 4 3 2 3 4 2 2 4	Weak Requirement 90 Weak Requirement 90 Weak Requirement 1 60 Weak Requirement 1 60 Weak Requirement 1 75 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 0 45 Weak Requirement 1 75 Requirement 2 120 1 60 Weak Requirement 2 120 1 60 Weak Requirement 1 60 Weak Requirement 1 60 Weak Requirement 1 60 Weak Requirement 1 90 0 1 90	
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SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0103 - Object-Oriented Programming SCC0231 Introduction to Intelligent Systems SCC0230 - Artificial Intelligence SCC0233 Applications of Machine Learning and Data Mining SCC0230 - Artificial Intelligence SCC0244 Data Mining in Large Databases SCC0240 - Databases SCC0240 - Databases SCC02030 - Artificial Intelligence SCC0252 Computational Visualization SSC0103 - Object-Oriented Programming SCC0254 Introduction to Computational Geometry: algorithms and applications SCC0215 - File Organization SCC0215 - File Organization SCC0216 - Computational Modeling in Graphs SCC0271 Introduction to Computer Science II SCC0275 Introduction to Data Science SCC0277 Data Science Competitions SCC02077 Data Science Computer Systems	2 2 Cred. Cred. Pract. 4 3 2 3 4 2 2 4 4 4	Weak Requirement 90 Weak Requirement 90 Weak Requirement 1 60 Weak Requirement 1 60 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 1 75 Weak Requirement 2 120 1 60 Weak Requirement 2 120 1 60 Weak Requirement 4 60 Weak Requirement 90 Weak Requirement 1 60 Weak Requirement 1 90 Weak Requirement 1 90 Weak Requirement	10
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0992 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0103 - Object-Oriented Programming SCC0231 Introduction to Intelligent Systems SCC0230 - Artificial Intelligence SCC0233 Applications of Machine Learning and Data Mining SCC0234 Data Mining in Large Databases SCC0244 Data Mining in Large Databases SCC0245 Computational Visualization SCC0252 Computational Visualization SSC0103 - Object-Oriented Programming SCC0252 Computational Visualization SCC0254 Introduction to Computational Geometry: algorithms and applications Introduction to Computational Geometry: algorithms and applications SCC0271 Introduction to Bioinformatics SCC0215 - File Organization SCC0216 - Computational Modeling in Graphs SCC0275 Introduction to Data Science SCC0277 Data Science Competitions SCC02077 Data Science Competitions SCC0230 - Artificial Intelligence SCC0230 Introduction to Data Science SCC0277 Data Science Competitions SCC0230 - Artificial Intelligence SCC0230 Introduction to Data Science SCC0230 - Artificial Intelligence SCC0230 Introduction to Data Science SCC0230 - Artificial Intelligence	2 2 2 Cred. Cred. Pract. 4 3 2 3 4 2 2 4 4 4 2	Weak Requirement yeak Requirement weak Requirement weak Requirement foo Weak Requirement CH CE yoo Weak Requirement Too Weak Requirement yeak Requirement yeak Requirement yeak Requirement too Weak Requirement	10
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0103 - Object-Oriented Programming SCC0231 Introduction to Intelligence SCC0233 Applications of Machine Learning and Data Mining SCC0230 - Artificial Intelligence SCC0244 Data Mining in Large Databases SCC0240 - Databases SCC0240 - Databases SCC0230 - Artificial Intelligence SCC0252 Computational Visualization SSC0103 - Object-Oriented Programming SCC0254 Introduction to Computational Geometry: algorithms and applications SCC0271 Introduction to Bioinformatics SCC0271 Introduction to Bioinformatics SCC0273 Intelligent Mobile Robots SCC0275 Introduction to Computer Science II SCC0277 Data Science Competitions SCC02077 Data Science Competitions SCC0280 Accessibility in Computer Systems SSC0103 - Software Engineering SCC0283 Introduction to Semantic Web SCC0216 - Computational Modelling in Graphs	2 2 2 Cred. Cred. Pract. 4 3 2 3 4 2 2 4 4 4 2	Weak Requirement 90 Weak Requirement 90 Weak Requirement 160 Weak Requirement 160 Weak Requirement 175 Weak Requirement 290 Weak Requirement 175 Weak Requirement 290 Weak Requirement 175 Requirement 175 Requirement 160 Weak Requirement 190 Weak Requirement	10
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems I SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0130 - Object-Oriented Programming SCC0231 Introduction to Intelligent Systems SCC0230 - Artificial Intelligence SCC0233 Applications of Machine Learning and Data Mining SCC0230 - Artificial Intelligence SCC0244 Data Mining in Large Databases SCC0240 - Databases SCC0240 - Databases SCC0252 Computational Visualization SCC0252 Computational Visualization SCC0252 Computational Visualization SCC0254 Introduction to Bioinformatics SCC0271 Introduction to Bioinformatics SCC0271 Introduction to Bioinformatics SCC0273 Intelligent Mobile Robots SCC0275 Introduction to Computer Science II SCC0275 Introduction to Data Science SCC0275 ScC0271 Data Science Competitions SCC0210 - Artificial Intelligence SCC0275 Software Engineering SCC0283 Introduction to Semantic Web SCC0283 Introduction to Semantic Web SCC0216 - Computational Modelling in Graphs SCC0283 Introduction to Semantic Web SCC0216 - Computational Modelling in Graphs	2 2 2 Cred. Cred. Pract. 4 3 2 3 4 2 4 4 4 2 4	Weak Requirement 90 Weak Requirement 90 Weak Requirement 1 60 Weak Requirement 1 90 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 1 75 Weak Requirement 2 90 Weak Requirement 45 Weak Requirement 1 75 Requirement 2 120 1 60 Weak Requirement Weak Requirement 1 60 Weak Requirement 1 90 Weak Requirement	10 15
SSC0740 Embedded Systems SSC0902 - Computer Organization and Architecture SSC0950 System Software Design and Development SSC0140 - Operating Systems SSC0951 Development of optimized code SSC0902 - Computer Organization and Architecture SCC0201 - Introduction to Computer Science II SSC0959 Software Testing and Inspection SSC0130 - Software Engineering 8º Ideal Period SCC0225 Mobile Application Development Lab SSC0103 - Object-Oriented Programming SCC0231 Introduction to Intelligence SCC0233 Applications of Machine Learning and Data Mining SCC0230 - Artificial Intelligence SCC0244 Data Mining in Large Databases SCC0240 - Databases SCC0240 - Databases SCC0230 - Artificial Intelligence SCC0252 Computational Visualization SSC0103 - Object-Oriented Programming SCC0254 Introduction to Computational Geometry: algorithms and applications SCC0271 Introduction to Bioinformatics SCC0271 Introduction to Bioinformatics SCC0273 Intelligent Mobile Robots SCC0275 Introduction to Computer Science II SCC0277 Data Science Competitions SCC02077 Data Science Competitions SCC0280 Accessibility in Computer Systems SSC0103 - Software Engineering SCC0283 Introduction to Semantic Web SCC0216 - Computational Modelling in Graphs	2 2 2 Cred. Cred. Pract. 4 3 2 3 4 2 2 4 4 4 2	Weak Requirement 90 Weak Requirement 90 Weak Requirement 160 Weak Requirement 160 Weak Requirement 175 Weak Requirement 290 Weak Requirement 175 Weak Requirement 290 Weak Requirement 175 Requirement 175 Requirement 160 Weak Requirement 190 Weak Requirement	10

SCC0911 Advanced Topics in Computer Science II		3	2 105	
SME0808 Time Series Analysis and Dynamical Learning		4	0 60	
SME0123 - Statistics SME0822 Multivariate Analysis and Unsupervised Learning		4	Requirement 0 60	
SME0123 - Statistics			Requirement	
SME0823 Regression Models and Supervised Learning II SME0123 - Statistics		4	1 90 Requirement	
SSC0123 Special Topics in Software Engineering		3	0 45	
SSC0130 - Software Engineering SSC0128 Project Management		3	Weak Requirement 1 75	15
SSC0152 Network Management and Administration		3	2 105	30
SSC0142 - Computer Networks SSC0159 Advanced topics on High Performance Computing		3	Weak Requirement 0 45	
SSC0143 - Concurrent Programming		3	Weak Requirement	
SSC0643 Computer Systems Performance Evaluation		3	1 75	
SSC0114 - Computer Architecture or			Weak Requirement	
SSC0902 - Organization and Architecture of Computers		0	Weak Requirement	10
SSC0713 Evolutionary systems applied to robotics SSC0715 Intelligent Sensors		2 2	2 90 3 120	10
SSC0720 Software Engineering for Embedded Systems		3	1 75	
SSC0130 - Software Engineering SSC0724 Advanced Learning Technologies		3	Weak Requirement 0 45	
SCC0201 - Introduction to Computer Science II			Weak Requirement	
SSC0726 Software Reuse SSC0130 - Software Engineering		2	1 60 Weak Requirement	
SSC0741 Design and Implementation of Embedded Systems I		3	3 135	
SSC0740 - Embedded Systems SSC0744 Distributed Computation		3	Weak Requirement 3 135	
SSC0903 - High-Performance Computing		3	Weak Requirement	
SSC0904 - Distributed Computing Systems SSC0745 Real-time Computer Systems		3	Weak Requirement 0 45	
SSC0745 Real-time Computer Systems SSC0140 - Operating Systems I		3	Weak Requirement	
SSC0748 Mobile Networks		3	2 105	
SSC0142 - Computer Networks SSC0901 Laboratory on Security Engineering		2	Weak Requirement 1 60	15
SSC0900 - Security Engineering			Weak Requirement	
SSC0952 Internet of Things SSC0958 Cryptocurrencies and Blockchain		2 4	2 90 2 120	30
9º Ideal Period	Cred.	Cred.	CH CE CP ATPA	EXT
9º Ideal Period SCC0289 Supervised Exchange Project I	Cred. Lect.	Cred. Pract. 4	CH CE CP ATPA 10 360 300	EXT
SCC0289 Supervised Exchange Project I SCC0293 Undergraduate Project I		Pract. 4 4	10 360 300 10 360 300	EXT
SCC0289 Supervised Exchange Project I		Pract.	10 360 300	EXT
SCC0289 Supervised Exchange Project I SCC0293 Undergraduate Project I SCC0300 Entrepreneurs Project I SME0878 Statistical Data Mining SME0123 - Statistics		Pract. 4 4 4	10 360 300 10 360 300 10 360 300 2 120 Requirement	
SCC0289 Supervised Exchange Project I SCC0293 Undergraduate Project I SCC0300 Entrepreneurs Project I SME0878 Statistical Data Mining		Pract. 4 4 4	10 360 300 10 360 300 10 360 300 2 120	
SCC0289 Supervised Exchange Project I SCC0293 Undergraduate Project I SCC0300 Entrepreneurs Project I SME0878 Statistical Data Mining SME0123 - Statistics SME0822 - Multivariate Analysis and Unsupervised Learning		Pract. 4 4 4	10 360 300 10 360 300 10 360 300 2 120 Requirement Requirement	60
SCC0289 Supervised Exchange Project I SCC0293 Undergraduate Project I SCC0300 Entrepreneurs Project I SME0878 Statistical Data Mining SME0123 - Statistics SME0822 - Multivariate Analysis and Unsupervised Learning	Lect.	Pract. 4 4 4 4 Cred.	10 360 300 10 360 300 10 360 300 2 120 Requirement Requirement	60
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