

# CURRICULUM

No	Course ID	Course name	Num of credits	Obligatory	Optional	Theory hours	Practice hours	Prerequisite course	Semester
<b>General knowledge</b>									
1	ML605	Philosophy of Postgraduate Education	3	X		45	0		I, II
<i>Total: 3 credits (Obligatory: 3 credits)</i>									
<b>Fundamental knowledge</b>									
2	CT634	Research methodology	2	X		15	30		I, II
3	CT635	Academic activities	1	X			30		I, II
4	CTK601	Mathematics for Computer science	3	X		30	30		I, II
5	CT608	Advanced Artificial Intelligence	3	X		30	30		I, II
6	CT611	Advanced Design and Analysis of Algorithms	3		X	30	30		I, II
7	CTK615	Operating Systems and System Programming	3		X	30	30		I, II
8	CTK610	Advanced computer architecture	3		X	45	0		I, II
9	CT636	Free and open source software	3		X	30	30		I, II
<i>Total: 12 credits (Obligatory: 9 credits; Optional: 3 credits)</i>									
<b>Specialized knowledge</b>									
10	CTH612	Advanced database	3	X		30	30		I, II
11	CTK616	Advances Machine Learning	3	X		30	30		I, II
12	CTK604	Knowledge discovery and data mining	3	X		30	30		I, II
13	CTK612	High-performance computing	3		X	30	30		I, II
14	CTK614	Theory of Computation	3		X	30	30		I, II
15	CTK613	Multimedia database	3		X	30	30		I, II
16	CTK611	Cryptography Theory and Applications	3		X	30	30		I, II
17	CT617	Geographic Information System	3		X	30	30		I, II
18	CT624	Information retrieval	3		X	30	30		I, II
19	CT632	Social network analysis - SNA	3		X	30	30		I, II
20	CTK620	Parallel computing for Data mining	3		X	30	30		I, II
<i>Total: 18 credits (Obligatory: 9 credits; Optional: 9 credits)</i>									
<b>Scientific research</b>									
21	CTK000	Computer Science Thesis	15	X		0	450		
22	CTK003	Research subject on Computer Vision and Image Processing	3	X		30	30		I, II
23	CTK004	Special subject on Visual data mining	3	X		30	30		I, II
24	CTK005	Special subject on Natural Language Processing	3		X	30	30		I, II
25	CTK006	Special subject on multimedia data processing	3		X	30	30		I, II
26	CTK007	Special subject on big data processing	3		X	30	30		I, II
27	CTK008	Special subject on Recommendation System	3		X	30	30		I, II
<i>Total: 27 credits (Obligatory: 21 credits; Optional: 6 credits)</i>									
<b>Total</b>			<b>60</b>	<b>42</b>	<b>18</b>				

## 1.1. APPENDIX 2: SAMPLE STUDY PLAN

No	Course ID	Course Name	Credits	Obligatory credits	Optional credits	Theory hours	Practical hours	Prerequisite course	Parallel course	Note
<b>Semester 1</b>										
1	ML605	Philosophy of Postgraduate Education	3	3		45	0			
2	CT634	Research methodology	2	2		15	30			
3	CT635	Academic activities	1	1		0	30			
4	CTK601	Mathematics for Computer science	3	3		30	30			
5	CT608	Advanced Artificial Intelligence	3	3		30	30			
6	CT611	Advanced Design and Analysis of Algorithms	3		3	30	30			
7	CTK615	Operating Systems and System Programming	3			30	30			
8	CTK610	Advanced computer architecture	3			45	0			
9	CT636	Free and open source software	3			30	30			
<b>Semester 2</b>										
1	CTH612	Advanced database	3	3		30	30			
2	CTK616	Advances Machine Learning	3	3		30	30			
3	CTK604	Knowledge discovery and data mining	3	3		30	30			
4	CTK614	Theory of Computation	3		6	30	30			
5	CTK611	Cryptography Theory and Applications	3			30	30			
6	CT617	Geographic Information System	3			30	30			
7	CT624	Information retrieval	3			30	30			

No	Course ID	Course Name	Credits	Obligatory credits	Optional credits	Theory hours	Practical hours	Prerequisite course	Parallel course	Note
<b>Semester 3</b>										
1	CTK003	Research subject on Computer Vision and Image Processing	3	3		30	30			
2	CTK004	Special subject on Visual data mining	3	3		30	30			
3	CTK005	Special subject on Natural Language Processing	3		6	30	30			
4	CTK006	Special subject on multimedia data processing	3			30	30			
5	CTK007	Special subject on big data processing	3			30	30			
6	CTK008	Special subject on Recommendation System	3			30	30			
7	CTK612	High-performance computing	3		3	30	30			
8	CT632	Social network analysis - SNA	3			30	30			
9	CTK613	Multimedia database	3			30	30			
<b>Semester 4</b>										
1	CTK000	<b>Computer Science Thesis</b>	15	15		0	450			

## MAPPING POS TO ELOS

Program objectives (Part 2.1)	Expected learning outcomes (Part 2.2)					
	Knowledge (2.2.1)			Skill (2.2.2)		Level of autonomy and responsibility (2.2.3)
	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6
PO1	X	X	X	X	X	X
PO2		X	X	X	X	X
PO3	X	X	X	X	X	X

## MAPPING CLOs TO ELOs

Courses			Expected learning outcomes (Part 2.2)					
			Knowledge (2.2.1)			Skill (2.2.2)		Level of autonomy and responsibility (2.2.3) ELO6
			ELO1	ELO2	ELO3	ELO4	ELO5	
<b>General Knowledge</b>								
1	ML605	Philosophy of Postgraduate Education	X					
<b>Fundamental Knowledge</b>								
2	CT634	Research methodology			X		X	X
3	CT635	Academic activities			X		X	X
4	CTK601	Mathematics for Computer science		X		X	X	X
5	CT608	Advanced Artificial Intelligence		X		X	X	X
6	CT611	Advanced Design and Analysis of Algorithms		X		X		X
7	CTK615	Operating Systems and System Programming		X		X		X
8	CTK610	Advanced computer architecture		X		X		X
9	CT636	Free and open source software		X		X		X
<b>Specialized Knowledge</b>								
10	CTH612	Advanced database			X	X	X	X
11	CTK616	Advances Machine Learning			X	X	X	X
12	CTK604	Knowledge discovery and data mining			X	X	X	X

Courses			Expected learning outcomes (Part 2.2)					
			Knowledge (2.2.1)			Skill (2.2.2)		Level of autonomy and responsibility (2.2.3) ELO6
			ELO1	ELO2	ELO3	ELO4	ELO5	
13	CTK612	High-performance computing			X	X	X	X
14	CTK614	Theory of Computation			X	X	X	X
15	CTK613	Multimedia database			X	X		X
16	CTK611	Cryptography Theory and Applications			X	X	X	X
17	CTK620	Parallel computing for Data mining			X	X	X	X
18	CT617	Geographic Information System			X	X		X
19	CT624	Information retrieval			X	X		X
20	CT632	Social network analysis - SNA			X	X		X
<b>Scientific Research</b>								
21	CTK000	Computer Science Thesis			X	X	X	X
22	CTK003	Research subject on Computer Vision and Image Processing			X	X	X	X
23	CTK004	Special subject on Visual data mining			X	X	X	X
24	CTK005	Special subject on Natural Language Processing			X	X	X	X
25	CTK006	Special subject on multimedia data processing			X	X	X	X
26	CTK007	Special subject on big data processing			X	X	X	X
27	CTK008	Special subject on Recommendation System			X	X	X	X

# MACS PROGRAMME CURRICULUM MAP

1 <sup>st</sup> year		2 <sup>nd</sup> year	
1 <sup>st</sup> semester	2 <sup>nd</sup> semester	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
<div style="background-color: #d9ead3; border: 1px solid #d9ead3; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;"><b>ML605</b> Philosophy of Postgraduate Education</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CT608 Advanced Artificial Intelligence</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CT635 Academic activities</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK601 Mathematics for Computer science</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CT634 Research methodology</p> </div> <div style="border: 1px dashed #d9ead3; border-radius: 10px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;"><b>Select 1 from:</b></p> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CT611 Advanced Design and Analysis of Algorithms</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK615 Operating Systems and System Programming</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CT636 Free and opensource software</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px;"> <p style="text-align: center;">CTK610 Advanced computer architecture activities</p> </div> </div>	<div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTH612 Advanced database</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK616 Advances Machine Learning</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK604 Knowledge discovery and data mining</p> </div> <div style="border: 1px dashed #d9ead3; border-radius: 10px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;"><b>Select 2 from:</b></p> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK614 Theory of Computation</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK611 Cryptography Theory and Applications</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CT617 Geographic Information System</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px;"> <p style="text-align: center;">CT624 Information retrieval</p> </div> </div>	<div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK003 Research subject on Computer Vision and Image Processing</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK004 Special subject on Visual data mining</p> </div> <div style="border: 1px dashed #d9ead3; border-radius: 10px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;"><b>Select 2 from:</b></p> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK005 Special subject on Natural Language Processing</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK006 Special subject on multimedia data processing</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK007 Special subject on big data processing</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px;"> <p style="text-align: center;">CTK008 Special subject on Recommendation System</p> </div> </div> <div style="border: 1px dashed #d9ead3; border-radius: 10px; padding: 5px;"> <p style="text-align: center;"><b>Select 1 from:</b></p> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK612 High-performance computing</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center;">CTK613 Multimedia database</p> </div> <div style="background-color: #fff2cc; border: 1px solid #fff2cc; border-radius: 5px; padding: 5px;"> <p style="text-align: center;">CT632 Social network analysis - SNA</p> </div> </div>	<div style="background-color: #d9534f; border: 1px solid #d9534f; border-radius: 10px; padding: 10px; text-align: center; color: white;"> <p style="margin: 0;"><b>CTK000</b> Computer Science Thesis</p> </div>