Appendix 1A: Course Schedule

Software Engineering and Computing Technology Program

Year I: Semester I

Course Code	Course Title	ECTS/ Week	Lec.	Tut.	Lab	Home Study
First Year - Semester I						
FLEn-1011	Communicative English Language Skill I	5	32	48	0	
Math-1011	Mathematics for Natural Sciences	5	32	48	0	
LoCT 1011	Critical Thinking	5	32	48	0	
Psch 1011	General Psychology	5	32	48	0	
Phys 1011	General Physics	5	32	16	48	
SpSc 1011	Physical Fitness	-	32	-	-	
GeES – 1011	Geography of Ethiopia and the Horn	5	32	48	0	
Total		**30**				

Year I: Semester II

Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
First Year - Semester II						
FLEn-1012	Communicative English Language Skill II	5	32	48	0	
Anth 1012	Social Anthropology	4	32	16	0	
Math 1041	Applied Mathematic I	5	32	48	0	
MGMT1012	Entrepreneurship	5	32	48	0	
EmTe-1012	Introduction to Emerging Technologies	5	32	16	48	
MCiE 1012	Morale and Civic Education	4	32	16	0	

SECT 1082	Computer Programing	5	32	16	48	
Total		**33**				

Year II: Semester I

Second Year - Semester I						
Course Code	**Course Title**	**ECTS /Week**	**Lec.**	**Tut.**	**Lab**	**Home Study**
MEng-2061	Engineering Drawing	5	32	16	48	
CEng- 2051	Engineering Mechanics I (Statics)	5	32	48	0	
Stat-2171	Probability and Statistics for Engineers	5	48	32	0	
Math-2041	Applied Mathematics II	7	48	48	0	
GITr-1012	Global Trends	4	32	16	0	
Econ-1011	Economics	5	32	48	0	
SNIE-1012	Inclusiveness	4	32	16	0	
Total		**35**				

Year II: Semester II

Second Year - Semester II						
Course Code	**Course Title**	**ECTS /Week**	**Lec.**	**Tut.**	**Lab**	**Home Study**
Math-2042	Applied Mathematics III	7	48	48	0	
SECT-2171	Fundamental of Networking	5	32	16	48	
SECT-2161	Fundamental of Database	5	32	16	48	
SECT-2101	Object Oriented Programming	5	32	16	48	
SECT-3092	Discrete Mathematics	5	32	16	48	
SECT-3091	Fundamental of Data Structure and Algorithm Analysis	7	48	32	48	
		34				

Year III: Semester I

Third Year - Semester I						
Course Code	**Course Title**	**ECTS /Week**	**Lec.**	**Tut.**	**Lab**	**Home Study**
SECT-2121	Fundamentals of Electrical Circuits and Electronics	5	32	16	48	
SECT-2111	Fundamentals of Software Engineering	5	32	16	48	
SECT-3122	Computer Organizations and Architecture	7	48	32	48	
SECT-3131	Human Computer Interaction	5	32	16	48	
SECT-3112	Web Design and Programming	7	48	32	48	
		29				

Year III: Semester II

Third Year - Semester II						
Course Code	**Course Title**	**ECTS /Week**	**Lec.**	**Tut.**	**Lab**	**Home Study**
SECT-3151	Fundamentals of AI	5	32	16	48	
SECT-3141	Fundamentals of Cybersecurity	5	32	16	48	
SECT-3132	Computer Graphics	5	32	16	48	
SECT-3113	Mobile Application Development	7	32	16	48	
SECT-3082	Operating Systems and System Programming	7	48	32	48	
	Total	**29**				

Software Engineering Stream

Year IV: Semester I

Fourth Year - Semester II

Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
SECT -4181	Requirement Engineering, Architecture and Design	7	48	32	48	
SECT -4451	Machine Learning and Big data	5	32	16	48	
SECT - 4141	Fundamentals of Distributed Systems	7	48	32	48	
SECT - 4231	Software Project Management	5	32	16	32	
SECT - 4221	Enterprise Application Development	7	48	16	48	
	Total	31				

Year IV: Semester II

Fourth Year - Semester I						
Course Code	Course Name	ECTS /Week	Lec.	Tut	Lab	Home
SECT-4431	Industry Internship	30	0	0	400	350
Phil 3011	Philosophy of Science and Ethics	5	32	16	0	
	Total	35				

Year V: Semester I

	Fifth Year - Semester I					
Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
SECT -5221	Advanced Database Systems	7	48	32	48	
SECT - 5XXX	Elective I	5				
SECT - 5241	Pervasive Computing	5	32	16	48	
SECT - 5441	Project I	7	0	0	128	
	Total	24				

Year V: Semester II

	Fifth Year - Semester II					
Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
SECT-4461	Cloud Computing and Security	5	32	16	32	
SECT- 5191	Software Testing, Verification and Quality Assurance	7	48	16	48	
SECT - 5XXX	Elective II	5				
SECT- 5201	Selected Topics in Software Engineering	5	32	16	32	
SECT- 5442	Project II	7	0	0	128	
	Total	29				

Summary of SE Stream ECTS

Software Engineering Stream

Software Engineering
39.8%
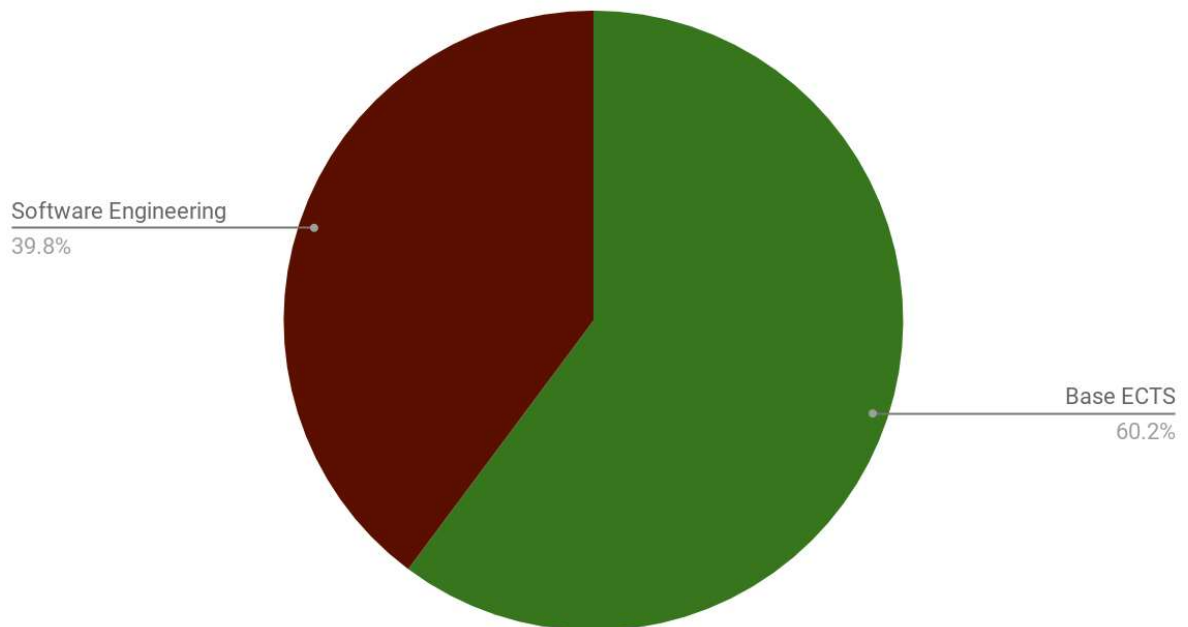
Base ECTS
60.2%

Information Technology Stream

Year IV: Semester I

Fourth Year - Semester II						
Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
SECT- 4211	Enterprise Systems and Network Administration	7	48	32	48	
SECT - 4271	Database Administration and Security	7	32	16	48	
SECT - 4291	Data Mining and Analytics	5	32	16	48	
SECT - 4231	Software Project Management	5	32	16	48	
SECT - 4281	E-business Strategy and Development	5	32	16	32	
	Total	29				

Year IV: Semester II

Fourth Year - Semester I						
Course Code	Course Name	ECTS /Week	Lec.	Tut	Lab	Home
SECT-4431	Industry Internship	30	0	0	400	350
Phil 3011	Philosophy of Science and Ethics	5	32	16	0	
	Total	35				

Year V: Semester I

Fifth Year - Semester I

Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
SECT - 4141	Fundamentals of Distributed Systems	7	48	32	48	
SECT-4461	Cloud Computing and Security	5	32	16	32	
SECT - 5XXX	Elective I	5	32	16	48	
SECT - 5291	Information Retrieval	5	32	16	32	
SECT - 5441	Project I	7	0	0	128	
	Total	29				

Year V: Semester II

Fifth Year - Semester II

Course Code	Course Title	ECTS /Week	Lec.	Tut.	Lab	Home Study
SECT- 5381	Ethical Hacking and Penetration Testing	7	32	16	32	
SECT - 5261	Selected Topics in Information Technology	5	32	16	32	
SECT - 5XXX	Elective II	5	32	16	48	
SECT - 5442	Project II	7	0	0	128	
	Total	24				

Summary of Information Technology Stream ECTS

Information Technology Stream

Information Technology
40.0%

Base ECTS
60.0%

Artificial Intelligence Stream

Year IV: Semester I

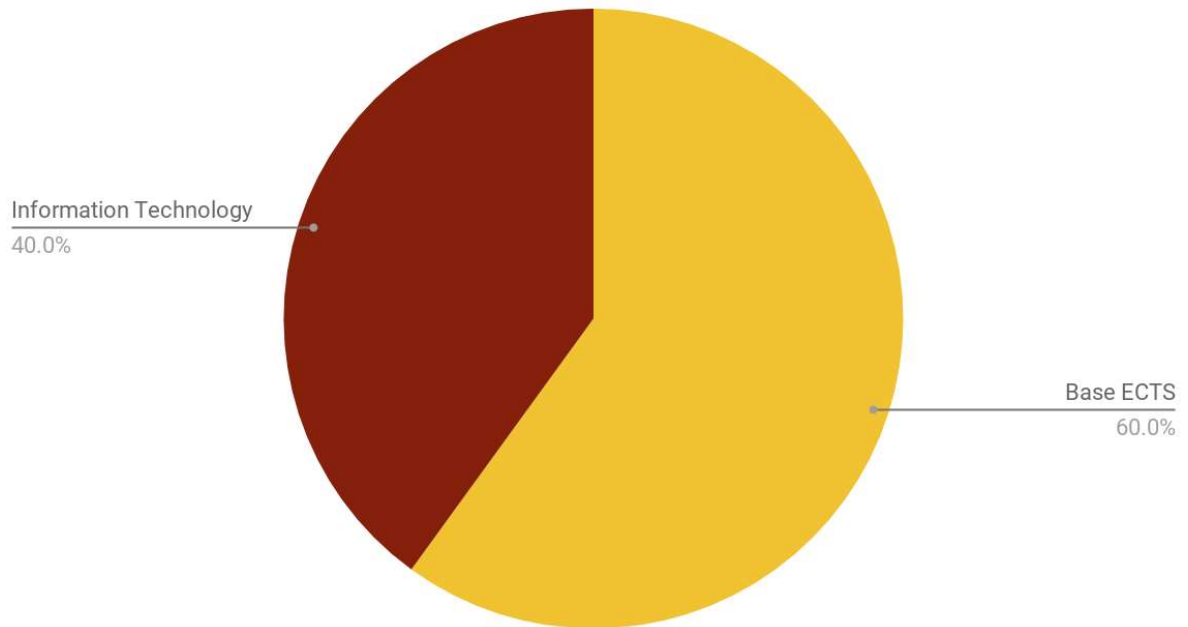<table>
<tr><th colspan="7">Fourth Year - Semester I</th></tr>
<tr><th>Course Code</th><th>Course Title</th><th>ECTS /Week</th><th>Lec.</th><th>Tut.</th><th>Lab</th><th>Home Study</th></tr>
<tr><td>SECT - 4341</td><td>Mathematics for AI</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 4231</td><td>Software Project Management</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 4321</td><td>Social Network Analysis</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 4301</td><td>Introduction to Robotics and Intelligent Systems</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 4331</td><td>Machine Learning</td><td>7</td><td>48</td><td>32</td><td>48</td><td></td></tr>
<tr><td>SECT - 4342</td><td>Programming for AI</td><td>5</td><td>32</td><td>16</td><td>32</td><td></td></tr>
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Year IV: Semester II

<table>
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<tr><td>SECT-4431</td><td>Industry Internship</td><td>30</td><td>0</td><td>0</td><td>400</td><td>350</td></tr>
<tr><td>Phil 3011</td><td>Philosophy of Science and Ethics</td><td>5</td><td>32</td><td>16</td><td>0</td><td></td></tr>
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Year V: Semester
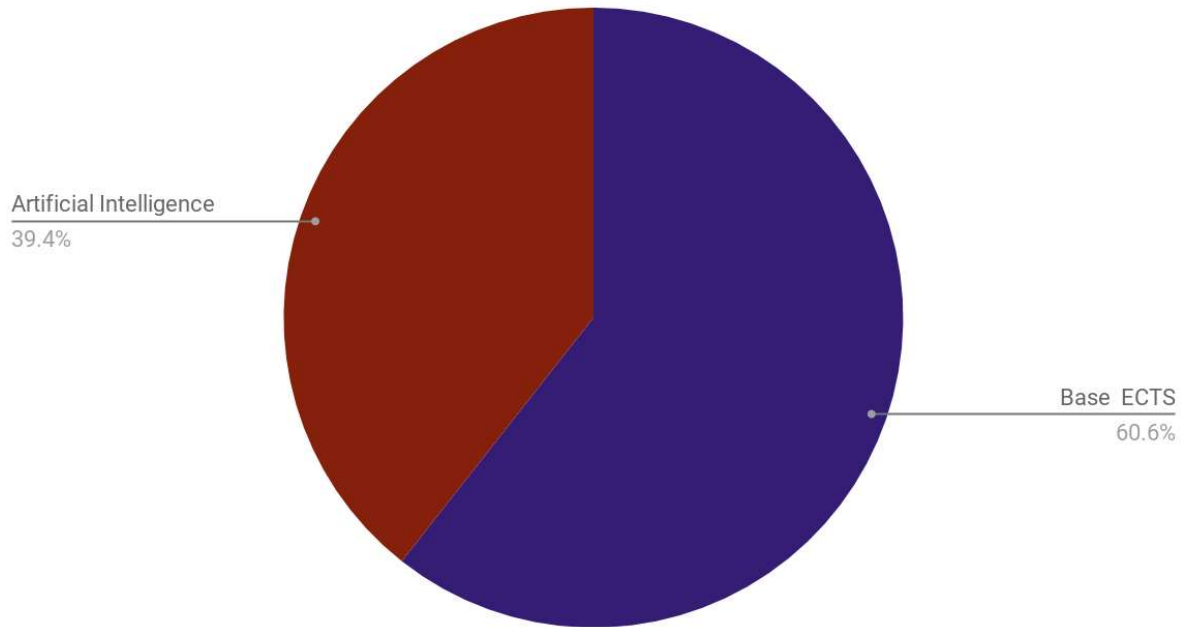
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<tr><th>Course Code</th><th>Course Title</th><th>ECTS /Week</th><th>Lec.</th><th>Tut.</th><th>Lab</th><th>Home Study</th></tr>
<tr><td>SECT - 5311</td><td>Selected Topics in AI</td><td>5</td><td>32</td><td>16</td><td>32</td><td></td></tr>
<tr><td>SECT - 5XXX</td><td>Elective I</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5441</td><td>Project - I</td><td>7</td><td>48</td><td>32</td><td>48</td><td></td></tr>
<tr><td>SECT - 5332</td><td>Deep Learning</td><td>5</td><td>32</td><td>16</td><td>32</td><td></td></tr>
<tr><td>SECT - 5303</td><td>Machine Intelligence</td><td>5</td><td>32</td><td>16</td><td>32</td><td></td></tr>
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Year V: Semester II

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<tr><th colspan="7">Fifth Year - Semester II</th></tr>
<tr><th>Course Code</th><th>Course Title</th><th>ECTS /Week</th><th>Lec.</th><th>Tut.</th><th>Lab</th><th>Home Study</th></tr>
<tr><td>SECT - 5302</td><td>Computer Vision</td><td>7</td><td>32</td><td>16</td><td>32</td><td></td></tr>
<tr><td>SECT - 5333</td><td>Reinforcement Learning</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5442</td><td>Project II</td><td>7</td><td>48</td><td>32</td><td>48</td><td></td></tr>
<tr><td>SECT - 5XXX</td><td>Elective II</td><td>5</td><td>32</td><td>16</td><td>32</td><td></td></tr>
<tr><td colspan="2" align="right">Total</td><td>24</td><td></td><td></td><td></td><td></td></tr>
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Summary of Artificial Intelligence Stream ECTS

Artificial Intelligence Stream

Artificial Intelligence
39.4%

Base ECTS
60.6%

Cyber Security Stream

Year IV: Semester I

Fourth Year - Semester I						
Course Code	**Course Title**	**ECTS /Week**	**Lec.**	**Tut.**	**Lab**	**Home Study**
SECT - 4381	Enterprise Systems and Network Security	7	48	32	48	
SECT - 4371	Cryptographic Concepts and Applications	5	32	16	48	
SECT-4451	Machine Learning and big data	5	32	16	32	
SECT - 4351	Software Project Management	5	32	16	48	
SECT-4461	Cloud Computing Security	5	32	16	48	
	Total	**27**				

Year IV: Semester II

Fourth Year - Semester I						
Course Code	**Course Name**	**ECTS /Week**	**Lec.**	**Tut**	**Lab**	**Home**
SECT-4431	Industry Internship	30	0	0	400	350
Phil 3011	Philosophy of Science and Ethics	5	32	16	0	
	Total	35				

Year V: Semester I

<table>
<tr><td colspan="7" align="center">Fifth Year - Semester I</td></tr>
<tr><td>Course Code</td><td>Course Title</td><td>ECTS /Week</td><td>Lec.</td><td>Tut.</td><td>Lab</td><td>Home Study</td></tr>
<tr><td>SECT- 5381</td><td>Ethical Hacking and Penetration Testing</td><td>7</td><td>48</td><td>32</td><td>48</td><td></td></tr>
<tr><td>SECT - 5361</td><td>Computer Crime and Digital Forensics</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5391</td><td>Software Security</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5XXX</td><td>Elective I</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5441</td><td>Project I</td><td>7</td><td>48</td><td>32</td><td>48</td><td></td></tr>
<tr><td colspan="2" align="right">Total</td><td>29</td><td></td><td></td><td></td><td></td></tr>
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Year V: Semester II

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<tr><td>SECT - 5351</td><td>Information Systems Security, Audit and Compliance</td><td>7</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5XXX</td><td>Elective II</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5401</td><td>Selected Topics in Cyber security</td><td>5</td><td>32</td><td>16</td><td>48</td><td></td></tr>
<tr><td>SECT - 5442</td><td>Project II</td><td>7</td><td>48</td><td>32</td><td>48</td><td></td></tr>
<tr><td colspan="2" align="right">Total</td><td>24</td><td></td><td></td><td></td><td></td></tr>
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Summary of Cyber Security Stream ECTS

Cyber Security Engineering Stream

Cyber Security
40.4%

Base ECTS
59.6%