

MSIT CURRICULUM STRUCTURE

The MSIT program is arranged into three tracks as mentioned earlier. To satisfy graduation requirements, students must accrue 144 units, but no more than 168, and a cumulative quality point average of at least 3.0 (i.e., a B grade in each course) by passing several core, domain, and elective courses in addition to a project course as shown in Table 1.

For the Professional Track, the 144 units include 72 units of core courses, 36 units of domain courses, 12 units of elective courses, 24 units of MSIT Practicum (04-900), and a three-month master's internship. Domain or elective courses can include up to 12 units of undergraduate credit (courses with numbers between XX-300 and XX-599), and up to 15 units of MSIT Independent Study (04-980).

For the Research Track, the 144 units include 72 units of core courses, 36 units of domain courses, 36 units of Engineering Research Project (04-990), and a three-month master's internship. Domain courses can include up to 12 units of undergraduate credit (courses with numbers less than XX-600).

For the Entrepreneurship Track, the 144 include 72 units of core courses, 36 units of domain courses, 12 units of elective courses, 24 units of an entrepreneurship project, and a three-month master's internship. Domain and elective courses can include up to 12 units of undergraduate credit (courses with numbers less than XX-600).

Table 1: Arrangement of the MSIT program

	Professional	Research	Entrepreneurship
MSIT Component	Units	Units	Units
Core Courses	72	72	72
Domain Courses	36	36	36
Elective Courses	12	0	12
Practicum Project	24		
Research Project		36	
Entrepreneurship Project			24
Mandatory 3-Month Internship	0	0	0
Total Units	144	144	144

The program is arranged to give every student a broad foundation in the core areas of IT, with the opportunity to further specialize in specific areas. The program is arranged in the following thematic areas:

1. Software Engineering
2. Applied Machine Learning
3. Cybersecurity
4. Network Technologies
5. IT Entrepreneurship
6. Leadership and Professional Skills.

MSIT Core Courses

Every student is required to select at least 12 units from each of the six thematic areas, for a total of 72 units of core courses. The core courses, shown in Table 2, are reviewed and updated by CMU-Africa faculty from time to time.

Table 2: List of core courses in the six thematic areas of the MSIT program

Thematic Area	Core Courses	Units
Software Engineering	04-630: Data Structures and Algorithms for Engineers	12
Applied Machine Learning	18-785: Data, Inference, and Applied Machine Learning	12
	04-655: Artificial Intelligence for Engineers	12
	18-661: Introduction to Machine Learning for Engineers	12
Cybersecurity	18-631: Introduction to Information Security	12
Network Technologies	04-641: Fundamentals of Telecommunications and Computer Networks	12
	18-859: Networking Lab	12
IT Entrepreneurship	04-800: Foundations of Entrepreneurship	12
	04-613: ICT Business Economics and Finance	12
Leadership and Professional Skills	04-601: ICT in Africa Seminar (Year 1)	6
	04-603: ICT Entrepreneurship Seminar (Year 1)	6
	04-605: ICT Professional Development Seminar (Year 2)	6

MSIT Domain Courses

Every student is required to take at least 36 units from the list of domain courses, shown in Table 3. The domain courses are reviewed and updated by CMU-Africa faculty from time to time. Note that courses in the core structure of Table 2 that are not selected are automatically available for selection in the domain structure.

Table 3: List of domain courses in the six thematic areas of the MSIT program

Thematic Area	Domain Courses	Units
Software Engineering	18-652: Foundations of Software Engineering	12
	18-641: Design Patterns for Smartphone Development	12
	04-631: Advanced Database Systems	12
	04-632: DevOps: Software Development and IT Operations	12
	04-634: Software Architecture and Design	12
	04-636: Software Accessibility	12
	04-633: Embedded Systems Development	12
	04-801-04: Model-driven Software Engineering	12
	04-800-I: Introduction to Systems Software Engineering	12
Applied Machine Learning	11-785: Introduction to Deep Learning	12
	04-800: Machine Learning for Earth Observation	12
	04-637: Mobile Big Data Analytics and Management	12
	18-787-K3: Data Analytics	6
	18-797: Machine Learning for Signal Processing	12
	04-654: Introduction to Probabilistic Graphical Model	12
	04-800 B: Recommender Systems	12
Cybersecurity	04-721: Ethical Hacking	12
	18-731: Network Security	12
	04-623: Cyber Defense	12
	04-625: Intrusion Detection Systems	12
	04-622: Applied Cryptography	12
	04-800 AH: Cybersecurity Operations Project	12
	04-624: Information Systems Audit & Standards	12
Network Technologies	04-645: Internet of Things	12
	18-759: Wireless Communications and Mobile Networks	12
	04-800 J: Cloud Infrastructure and Computing	12
	15-619: Cloud Computing	15
	18-867: Applied Smart Grid Telecoms	6
	18-759: Wireless Networks	12

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MSIT Elective Courses

Students can select units of elective courses to fulfill their graduation requirements. The CMU-Africa [course catalog](#) provides the full list of all courses with descriptions.

MSIT Academic Skills Courses

An MSIT student will be required to do 12 units of academic skills courses if they do not pass an assessment test. These units will be over and above the required 144 units shown in Table 1. The student will take 6 units in the Fall Semester and 6 units in the Spring Semester. Table 4 shows the academic skills courses.

Table 4: List of academic skills courses.

No	Academic Skills Course	Units
1.	04-606: Academic Skills for Engineers I (Fall)	6
2.	04-607: Academic Skills for Engineers II (Spring)	6
3.	04-608: Advanced Academic Skills for Engineers I (Fall)	6
4.	04-609: Advanced Academic Skills for Engineers II (Spring)	6

MSIT Internship and Project Courses

Table 4 provides a list of internship and project courses.

Table 5: Internship or Project Courses

Course	Duration	Units	Track
MSIT Internship	3 months	0	All
04-900: MSIT Practicum	1 semester	24	Professional
04-910: MSIT Entrepreneurship Project	1 or 2 semesters	24	Entrepreneurship
04-990: Engineering Research Project	1 or 2 semesters	12-36	Research
04-980: Engineering Independent Study	1 semester	3-15	Professional or Entrepreneurship