

SEQ#	Category (Lv.1)	Category (Lv.2)	Category (Lv.3)	
ACM-01	Data Acquisition, Management and Governance (DG)	Data Acquisition		
ACM-02		Information Extraction		
ACM-03		Working with Various Types of Data		
ACM-04		Data Integration		
ACM-05		Data Reduction and Compression		
ACM-06		Data Transformation		
ACM-07		Data Cleaning		
ACM-08		Data Privacy and Security		
ACM-09	Computing and Computer Fundamentals (CCF)	Basic Computer Architecture		
ACM-10		Storage System Fundamentals		
ACM-11		Operating System Basics		
ACM-12		File Systems		
ACM-13		Networks		
ACM-14		The Web & Web Programming		
ACM-15		Compilers and Interpreters		
ACM-16	Data Mining (DM)	Proximity Measurement		
ACM-17		Data Preparation		
ACM-18		Information Extraction		
ACM-19		Cluster Analysis		
ACM-20		Classification and Regression		
ACM-21		Pattern Mining		
ACM-22		Outlier Detection		
ACM-23		Time Series Data		
ACM-24		Mining Web Data		
ACM-25		Information Retrieval		
ACM-26	Big Data Systems (BDS)	Problems of Scale		
ACM-27		Big Data Computing Architectures		
ACM-28		Parallel Computing Frameworks		
ACM-29		Distributed Data Storage		
ACM-30		Parallel Programming		
ACM-31		Techniques for Big Data Applications		
ACM-32		Cloud Computing		
ACM-33		Complexity Theory		
ACM-34		Software Support for Big Data Applications		
ACM-35	Programming, Data Structures, and Algorithms (PDA)	Algorithmic Thinking & Problem Solving		
ACM-36		Programming		
ACM-37		Data Structures		
ACM-38		Algorithms		
ACM-39		Basic Complexity Analysis		
ACM-40		Numerical Computing		
ACM-41	Software Development and Maintenance (SDM)	Software Design and Development		
ACM-42		Software Testing		
ACM-43	Data Privacy, Security, Integrity, and Analysis for Security (DPSIA)	Data Privacy	Social Responsibility	
ACM-44			Cryptography	
ACM-45			Information Systems	
ACM-46		Data Security	Communication Protocols	
ACM-47			Data quality and handling for security	
ACM-48			Classification of cryptographic tools	
ACM-49			Security and performance trade-off	
ACM-50			Network and web protocols	
ACM-51		Data Integrity	Logical integrity	
ACM-52			Physical integrity	
ACM-53			Security threats affecting data integrity	
ACM-54			Methods to ensure data integrity	
ACM-55			Data corruption and data validation	
ACM-56			Analysis for Security	Machine learning (ML) algorithms and statistical methods for security
ACM-57		Machine learning (ML) robustness and		
ACM-58		Categories of security applications		
ACM-59		Artificial Intelligence (AI)	General	
ACM-60			Knowledge representation and reasoning (Logic-based models)	
ACM-61	Knowledge representation and reasoning (Probability-based models)			

SEQ#	Category (Lv.1)	Category (Lv.2)	Category (Lv.3)
ACM-62		Planning and search strategies	
ACM-63	Machine Learning (ML)	General	
ACM-64		Supervised Learning	
ACM-65		Unsupervised Learning	
ACM-66		Mixed Methods	
ACM-67		Deep Learning	
ACM-68	Analysis and Presentation (AP)	Fundamental considerations	
ACM-69		Visualization	
ACM-70		User-centered design	
ACM-71		Interaction design	
ACM-72		Interface design and development	
ACM-73	Professionalism (PR)	Continuing Professional Development	
ACM-74		Communication	
ACM-75		Teamwork	
ACM-76		Economic Considerations	
ACM-77		Privacy and Confidentiality	
ACM-78		Ethical Considerations	
ACM-79		Legal Considerations	
ACM-80		Intellectual Property	
ACM-81		On Automation	