Academic Programs Booklet

College of Science

2025

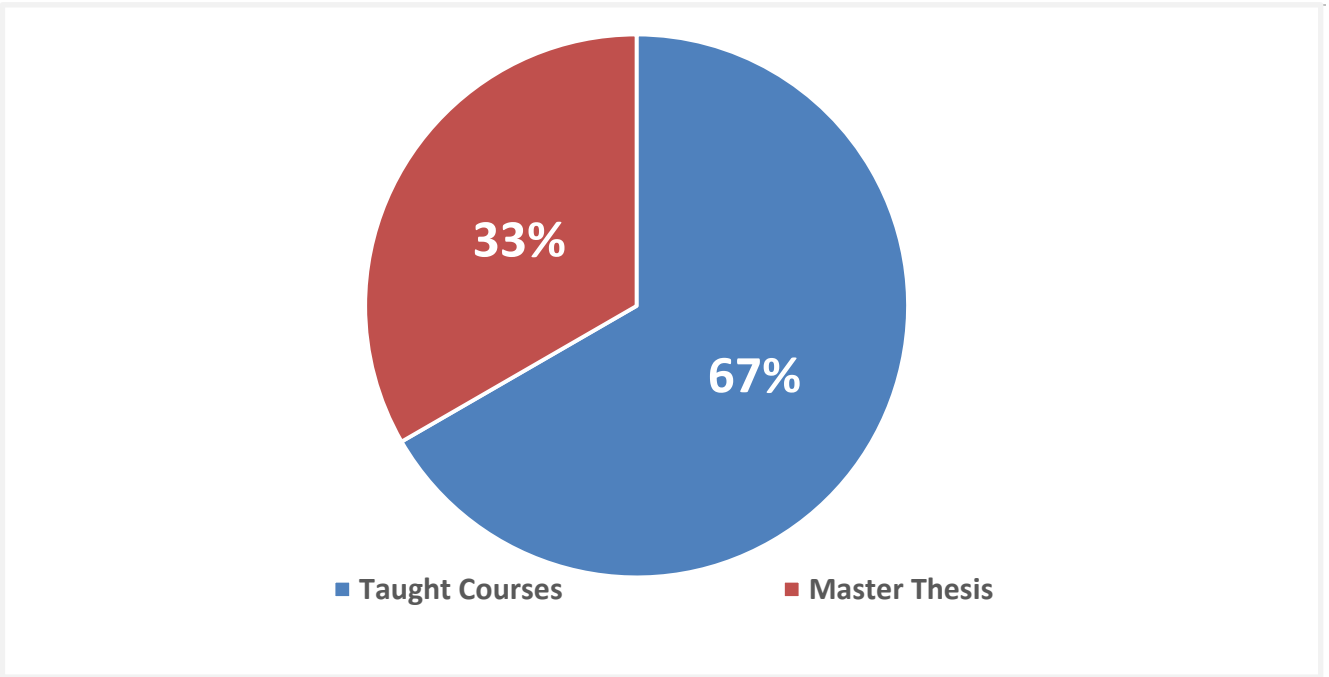
Prepared By: VP For Academic Programs and Graduate Studies Office

College of Science

College of Science

M.Sc. in Big Data Science and Analytics

Program Components



Taught Courses	24
Master Thesis	12
Total Credit (CRD)	36

Teaching Language: English

Detailed Study Plan

Year 1 – Semester 1

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BDSA 601	Research Methods	4	0	4	MR	NONE	YES
BDSA 602	Statistical Data Analysis	4	0	4	MR	NONE	YES
BDSA 603	Big Data Analytics	4	0	4	MR	NONE	YES
Total		**12**	**0**	**12**			

Year 1 – Semester 2

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BDSA 604	Machine Learning	4	0	4	MR	NONE	YES
BDSA 605	Data Mining	4	0	4	MR	NONE	YES
BDSA 610	Data Visualization	4	0	4	MR	NONE	YES
Total		**12**	**0**	**12**			

Year 2 – Semester 3

Course Code	Course Title	Course Hours			Course Type	Pre requisite	Major GPA
		LEC	PRAC	CRD			
BIOLS 609	THESIS	0	36	12	MR	PASSING 20 CREDITS	No
Total		**0**	**36**	**12**			

Course Description

Course Code:	**BDSA 601**	Course Credits:	(4-0-4)	Course Title:	**Research Methods**
Course Description:	The course is designed to equip students with the knowledge and transferable skills needed for a master thesis. The course covers methods of data collection, processing & analysis when conducting empirical research as well as data security and ethics associated with using open-source data. It also covers several important issues such as project management techniques, searching tools, literature review, citation, referencing, and plagiarism. The course emphasizes research-related communication skills and equips students with the skills of writing a master proposal and report as well as giving an oral presentation. The delivery mode of this course varies to span different methods such as lectures, seminars, workshops, and projects.				
Course Code:	**BDSA 602**	Course Credits:	(4-0-4)	Course Title:	**Statistical Data Analysis**
Course Description:	The role of statistics in data science. The concepts, the underlying assumptions, and the applications of parametric and nonparametric modelling approaches. The course provides students with a comprehensive knowledge about model fit, model validation, interpretation, and prediction for future observations. The topics are covered in the context of inference and prediction for quantitative and qualitative outcomes. The course covers generalized linear models, polynomial regression, generalized additive models, shrinkage methods and supervised learning methods. The emphasis is placed on analyzing real data using R programming language.				
Course Code:	**BDSA 603**	Course Credits:	(4-0-4)	Course Title:	**Big Data Analytics**
Course Description:	The course provides students with a detailed knowledge about data management tools and techniques. It covers data acquisition, accessing, storing, transferring, cleaning, visualizing, and data preparation for analysis. The course covers topics of information retrieval, entity-relationship model, relational algebra, indexing, query optimization, normal forms, tuning, security, and data analytics skills in both relational and non-relational environments of big data. The course emphasizes on a project work that involves modern relational DBMS and NoSQL environments.				
Course Code:	**BDSA 604**	Course Credits:	(4-0-4)	Course Title:	**Machine Learning**
Course Description:	Knowledge about artificial learning systems, covering both supervised and unsupervised learning. The course considers various machine learning techniques: Regression and Statistical Models, Classification, Clustering, Decision Trees, Support Vector Machines, Boosting, Neural Networks, Bayesian Networks, Computational Methods, and Simulation Techniques.				
Course Code:	**BDSA 605**	Course Credits:	(4-0-4)	Course Title:	**Data Mining**
Course Description:	The course covers the concepts and techniques of data mining. It provides students with a detailed knowledge about descriptive and predictive data mining methods that can be used to extract hidden patterns from data such as visualization, classification, clustering, association, estimation, etc. Topics of handling missing data and dealing with outliers are also covered by the course.				
Course Code:	**BDSA 610**	Course Credits:	(4-0-4)	Course Title:	**Data Visualization**
Course Description:	This course provides students with a formal grounding in Data Visualization (DV) as an analytical tool and a medium of communication. Topics covered include importance and value of visualization, coordinate systems, data types, data distributions, time series, trends, uncertainty, 3D graphs, creating dashboards to monitor real-time data changes. The course emphasizes the use of DV for the purpose of research, including the interpretation of charts and graphs within their scientific context to support decision making.				
Course Code:	**BDSA 609**	Course Credits:	(0-36-12)	Course Title:	**Thesis**
Course Description:	This course is a significant independent work conducted by the master student under the supervision of academic staff as a requirement for graduation. The work represents a solving problem-oriented project that provides students with an opportunity to appreciate research skills in relation to their professional career. The thesis will be examined by a selected panel of external and internal examiners.				