REGULATIONS FOR THE DEGREE OF
BACHELOR OF ARTS AND SCIENCES IN APPLIED ARTIFICIAL INTELLIGENCE
[BASc(AppliedAI)]
(Subject to Approval)

These regulations apply to candidates admitted to the first year of study of the four-year BASc(AppliedAI) curriculum in the academic year 2025-26 and thereafter.

(See also General Regulations and Regulations for First Degree Curricula)

Admission to the degree

AAI 1 To be eligible for admission to the degree of BASc(AppliedAI), candidates shall
(a) comply with the General Regulations;
(b) comply with the Regulations for First Degree Curricula; and
(c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

AAI 2 The curriculum shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years, unless otherwise permitted by the Board of Studies of the School of Computing and Data Science.

Curriculum requirements and progression in curriculum

AAI 3 (a) Candidates shall satisfy the requirements prescribed in UG 5 of the Regulations for First Degree Curricula, except that in the case of the Common Core Curriculum, 24 credits shall be required, comprising one course from each Area of Inquiry. Specific requirements are spelt out in the syllabuses.
(b) Candidates shall complete not fewer than 240 credits of courses.
(c) Candidates shall successfully complete not fewer than 96 credits of courses for the major, including 66 credits of core courses, 18-24 credits of disciplinary electives, 6-12 credits of capstone experience requirement.
(d) Candidates shall successfully complete 18 credits of BASc core courses.
(e) Candidates shall normally take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of Studies of the School of Computing and Data Science, or except in the final semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits.
(f) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Studies of the Computing and Data Science, candidates may exceed the annual study load of 72 credits in a given

academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 288 credits for the normative period of study as specified in AAI 2, save as provided for under AAI 3(g).

(g) Where candidates are required to make up for failed credits, the Board of the Studies of the School of Computing and Data Science may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 432 credits for the maximum period of registration specified in AAI 3.

Selection of courses

AAI 4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabus before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered. Withdrawal from courses on medical grounds after the designated add/drop period shall be considered by the Board of Studies of the School of Computing and Data Science.

Assessment and grades

AAI 5 Candidates shall be assessed in each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits. Grades shall be awarded in accordance with UG 8 of the Regulations for First Degree Curricula.

AAI 6 Candidates are required to make up for failed courses in the following manner:

(a) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
(b) re-submitting failed coursework, without having to repeat the same course of instruction; or
(c) repeating the failed course by undergoing instruction and satisfying the assessments; or
(d) for elective courses, taking another course in lieu and satisfying the assessment requirements.

AAI 7 Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.

AAI 8 There shall be no appeal against the results of examinations and all other forms of assessment.

Discontinuation of studies

AAI 9 Unless otherwise permitted by the Board of Studies of the School of Computing

and Data Science, candidates shall be recommended for discontinuation of their studies if they have:

(a) failed to complete 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters; or
(b) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester); or
(c) exceeded the maximum period of registration specified in AAI 2.

Absence from examination

AAI 10 Candidates who are unable, because of illness, to be present at the written examinations of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the first semester of the following academic year. Any such application shall normally be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.

Advanced standing

AAI 11 Advanced standing may be granted to candidates in recognition of studies successfully completed before admission to the curriculum in accordance with UG 2 of the Regulations for First Degree Curricula. Advanced credits shall not normally be included in the calculation of the GPA unless otherwise permitted by the Board of Studies of the School of Computing and Data Science but will be recorded on the transcript of the candidate.

Credit transfer

AAI 12 Candidates may, with the approval of the Board of Studies of the School of Computing and Data Science, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits may be recorded in the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.

Award of the degree

AAI 13 To be eligible for award of the degree of BASc(AppliedAI), candidates shall have
(a) achieved a Graduation GPA of 1.00 or above;
(b) passed a minimum of 240 credits, comprising 96 credits of the required courses of the Applied Artificial Intelligence major as prescribed in the degree of BASc(Applied AI) curriculum, and 18 credits of BASc core courses; and
(c) satisfied the requirements in UG 5 of the Regulations for First Degree Curricula, and specified in AAI 3(a).

Honours classification

AAI 14 (a) Honours classification shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Graduation GPA (GGPA) scores, with all courses taken (including failed courses) carrying weightings which are proportionate to their credit values[1]:

Class of honours	**GGPA range**
First Class Honours	3.60 – 4.30
Second Class Honours	(2.40 – 3.59)
Division One	3.00 – 3.59
Division Two	2.40 – 2.99
Third Class Honours	1.70 – 2.39
Pass	1.00 – 1.69

(b) Honours classification may not be determined solely on the basis of a candidate's Graduation GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in AAI 14(a) of the higher classification by not more than 0.1 Grade Point.

(c) A list of candidates who have successfully completed all the degree requirements shall be posted on School noticeboards.

[1] For students in the 2025-26 intake and thereafter who have successfully completed six 6-credit Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five 6-credit Common Core courses with the highest grades (covering all five Areas of Inquiry), or all six 6-credit courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA. For students who have successfully completed two 3-credit Common Core Microcredentials in place of one 6-credit Common Core course, the average grade point of the two 3-credit courses will be treated as the grade point of a 6-credit Common Core course.

SYLLABUS FOR THE DEGREE OF BACHELOR OF ARTS AND SCIENCES IN APPLIED ARTiFICIAL INTELLIGENCE [BASc(AppliedAI)]
(Subject to Approval)

The syllabus applies to candidates admitted to the first year of study of the four-year BASc(AppliedAI) curriculum in the academic year 2025-26 and thereafter.

Definition and Terminology

1. Each course offered shall be classified as either introductory level course or advanced level course.

2. "Disciplinary core course" is a compulsory course in the professional core which a candidate must pass in the manner provided for in the regulations.

3. "Disciplinary elective course" refers to any course offered in the professional core other than compulsory courses which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabus of the degree curriculum.

4. "Capstone experience course" is an integral part of the degree programme which focuses on integration and application of knowledge and skills gained in the early years of study. It is normally taken in the senior years (year 3 or 4) of study and candidates must complete this for fulfillment of the graduation requirements.

5. "Elective course" means any course offered within the same or another curriculum, other than compulsory courses in the candidate's degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

BASc(AppliedAI) curriculum

The BASc(AppliedAI) curriculum comprises 240 credits of courses, including 114 credits of disciplinary and capstone experience courses, with the following structures:

Course category	No. of credits
UG 5 Requirements	42 credits
BASc Core Courses	18 credits
Disciplinary Core Courses (Introductory)	48 credits
Disciplinary Core Courses (Advanced)	18 credits
Disciplinary Elective Courses (Advanced)	24 credits
Capstone Experience Courses	6 credits
Elective Courses	84 credits
Total	**240 credits**

UG 5 Requirements

Course code	Course	No. of credits
CAES1001	Academic Communication in English[1]	0
CAES9821	Professional and Technical Communication for Statistical Sciences	6
	Chinese language enhancement course specified for the degree curriculum[2]	6
	Common Core[3]	24
	Artificial Intelligence Literacy courses	6
	Non-credit bearing courses in national education and national security education, and any other non-credit bearing courses as may be required from time to time	0
	Total	**42**

[1]Unless otherwise exempted through having achieved Level 5 or above in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent.

[2]Candidates should check with the School of Computing and Data Science for the course code and course title of the Chinese language enhancement course to satisfy the programme and graduation requirements. For those who did not study Chinese language during their secondary education and have not reached the required proficiency level for the Chinese language enhancement course specified for the degree curriculum, they are required to take a course in either Chinese language or Chinese culture offered by the Chinese Language Centre of the School of Chinese in lieu.

[3]Candidates have to complete 24 credits in the Common Core Curriculum, comprising one course from each Area of Inquiry.

BASc Core Courses

Course code	Course	No. of credits
BASC9001	Approaching Interdisciplinarity: Knowledge Beyond Disciplines	6
BASC9002	Interdisciplinary Leadership and Sustainable Development	6
SDST1016	Data Science 101	6
	Total	**18**

Disciplinary Core Courses at Introductory Level

Course code	Course	No. of credits
ASAI1001	Artificial intelligence: foundation, philosophy and ethics	6
COMP1117	Computer programming	6
COMP2119	Introduction to data structures and algorithms	6
COMP2120	Computer organization	6
MATH1013	University mathematics II	6
MATH2014	Multivariable calculus and linear algebra	6
SDST2601	Probability and statistics I	6
SDST2602	Probability and statistics II	6
	Total	**48**

Disciplinary Core Courses at Advanced Level

Course code	Course	No. of credits
COMP3340	Applied deep learning	6
MATH3900	Optimization for AI and Data Analytics	6
SDST3612	Statistical machine learning	6
	Total	**18**

Disciplinary Electives at Advanced Level

At least 24 credits selected from the following courses:
(For fulfilling the requirement of a concentration[4], students should choose at least 18 credits, with at least 6 credits of which should be at advanced-level, from the corresponding list)

(a) Concentration: AI Technology (at least 18 credits)

Course code	Course	No. of credits
COMP3271	Computer graphics	6
COMP3356	Robotics	6
ASAI3010	Image processing and computer vision	6
ASAI4011	Natural language processing	6
ASAI4012	High-performance computing: algorithms and applications	6
ASAI4013	Applied high-performance computing and parallel programming	6
ASAI4099	Special topics of applied AI	6

(b) Concentration: AI in Business and Finance (at least 18 credits)

Course code	Course	No. of credits
COMP3320	Electronic commerce technology	6
MATH3901	Operations research I	6
MATH3906	Financial calculus	6
SDST3613	Marketing analytics	6
SDST4601	Time-series analysis	6
ASAI4099	Special topics of applied AI	6

(c) Concentration: AI in Medicine (at least 18 credits)

Course code	Course	No. of credits
SDST3655	Survival analysis	6
SDST4610	Bayesian learning	6
ASAI3021	Modern biostatistics	6
ASAI4022	Omics data analysis	6
ASAI4023	Medical image analysis	6
ASAI4099	Special topics of applied AI	6

(d) Concentration: AI in Smart City (at least 18 credits)

Course code	Course	No. of credits
URBS1003	Theories and Global Trends in Urban Development	6
URBS1005	Urban Problems, Interventions and Design Thinking	6
GEOG2090	Introduction to geographic information systems	6
GEOG2147	Building smart cities with GIS	6
GEOG2156	Introduction to Remote Sensing	6
GEOG3202	GIS in environmental studies	6
GEOG3420	Transport and society	6
GEOG3430	Geospatial data for environmental change	6
ASAI4099	Special topics of applied AI	6

(e) Concentration: AI in Neurocognitive Science (at least 18 credits)

Course code	Course	No. of credits
PSYC1001	Introduction to psychology	6
PSYC2007	Cognitive psychology	6
PSYC2051	Perception	6
PSYC2066	Foundations of cognitive science	6
PSYC2067	Seminars in cognitive science	6
ASAI4099	Special topics of applied AI	6

[4]As one of the graduation requirements, students must fulfill at least one of the five concentrations by completing at least 18 credits of courses prescribed specially for each corresponding concentration. Students may declare concentration(s) in their senior years of study (e.g. year 3 or 4), and are recommended to pursue (a) AI Technology, and if applicable, supplemented with a second concentration from (b) to (e). Upon graduation, a certification letter confirming the completion of the chosen concentration(s) will be provided for students.

List of Other Elective Courses:

Course code	Course	No. of credits
COMP3251	Algorithm design	6
COMP3252	Algorithm design and analysis	6
COMP3278	Introduction to database management systems	6
MATH3601	Numerical analysis	6
MATH3600	Discrete mathematics	6
MATH3911	Game theory and strategy	6
MATH3943	Network models in operations research	6
SDST3600	Linear statistical analysis	6
SDST3622	Data visualization	6
SDST4602	Multivariate data analysis	6

<u>Capstone Experience Courses</u>

At least 6 credits selected from the following courses:
(If students take the 12-credit 'Applied AI project', they do not need to take a 6-credit elective from the 'List of Other Elective' Courses above. On the other hand, students who do not take the 12-credit 'Applied AI project' are allowed to take a course in one of the Concentrations as an elective.)

Course code	Course	No. of credits
ASAI3799	Directed studies in Applied AI	6
ASAI4766	Applied AI internship	6
ASAI4798	Applied AI project	12

Elective Courses (84 credits)

Candidates should take at least 84 credits of courses offered by any department, except Common Core Courses. Candidates would only need to take 78 credits of elective courses should they have taken "ASAI4798 Applied AI project" (12 credits) as capstone experience course.

Impermissible Combinations:

Candidates reading Bachelor of Arts and Sciences in Applied Artificial Intelligence [BASc(AppliedAI)] programme cannot take the following majors/minors:

Major in Decision Analytics

DESCRIPTION FOR UNDERGRADUATE COURSES OFFERED BY THE SCHOOL OF COMPUTING AND DATA SCIENCE

The courses listed below may not be offered every year. The content and assessment of individual courses may be subject to adjustment upon review each academic year. Students should refer to the most up-to-date course outlines as distributed by individual course coordinators.

For the description of courses offered outside the School of Computing and Data Science, please refer to the syllabuses of the respective programmes in the corresponding teaching departments.

BASC CORE COURSES

SDST1016 Data science 101 (6 credits)

The course introduces basic concepts and methodology of data science to junior undergraduate students. The teaching is designed at a level appropriate for all undergraduate students with various backgrounds and without pre-requisites.

Students will engage in a full data work-flow including collaborative data science projects. They will study a full spectrum of data science topics, from initial investigation and data acquisition to the communication of final results.

Specifically, the course provides exposure to different data types and sources, and the process of data curation for the purpose of transforming them to a format suitable for analysis. It introduces elementary notions in estimation, prediction and inference. Case studies involving less-manicured data are discussed to enhance the computational and analytical abilities of the students.

Assessment: 100% continuous assessment

INTRODUCTORY LEVEL COURSES

ASAI1001 Artificial intelligence: foundation, philosophy and ethics (6 credits)

The goal of this course is to expose students to the fundamental concepts of artificial intelligence (AI), including the history of AI, the classical and modern approaches, the main techniques used in AI, the challenges and major breakthroughs, the philosophical problems and ethical issues, and the application fields. This course is exclusive to BASc(AppliedAI) students.

Assessment: 60% continuous assessment, 40% examination

COMP1117 Computer programming (6 credits)

This is an introductory course in computer programming. Students will acquire basic Python programming skills, including syntax, identifiers, control statements, functions, recursions, strings, lists, dictionaries, tuples and files. Searching and sorting algorithms, such as sequential search, binary search, bubble sort, insertion sort and selection sort, will also be covered.

Assessment: 50% continuous assessment and 50% examination

COMP2119 Introduction to data structures and algorithms (6 credits)

Arrays, linked lists, trees and graphs; stacks and queues; symbol tables; priority queues, balanced trees; sorting algorithms; complexity analysis.

Assessment: 40% continuous assessment, 60% examination

COMP2120 Computer organization (6 credits)

Introduction to computer organization and architecture; data representations; instruction sets; machine and assembly languages; basic logic design and integrated devices; the central processing unit and its control; memory and caches; I/O and storage systems; computer arithmetic.

Assessment: 50% continuous assessment, 50% examination

SDST2601 Probability and statistics I (6 credits)

The discipline of statistics is concerned with situations in which uncertainty and variability play an essential role and forms an important descriptive and analytical tool in many practical problems. Against a background of motivating problems this course develops relevant probability models for the description of such uncertainty and variability.

Assessment: 40% continuous assessment, 60% examination

SDST2602 Probability and statistics II (6 credits)

This course builds on SDST2601, introducing further the concepts and methods of statistics. Emphasis is on the two major areas of statistical analysis: estimation and hypothesis testing. Through the disciplines of statistical modelling, inference and decision making, students will be equipped with both quantitative skills and qualitative perceptions essential for making rigorous statistical analysis of real-life data.

Assessment: 40% continuous assessment, 60% examination

ADVANCED LEVEL COURSES

ASAI3010 Image processing and computer vision (6 credits)
The course introduces the fundamentals of image processing and computer vision, covering both theoretical and computational aspects of the subject. On the theoretical aspect, the course introduces mathematical foundations for image processing and computer vision including representation of digital images, image processing techniques, feature detection and extraction, imaging models, stereo vision, image recognition and beyond. On the computational side, algorithms and their implementation are emphasized during the lectures and exercised during tutorials.

Assessment: 50% continuous assessment, 50% examination

ASAI3021 Modern biostatistics (6 credits)

This course is designed to introduce students the state-of-the-art study designs and statistical analysis methods in biomedical studies including randomized and observational studies, Bayesian inference, phase II and phase III clinical trials and adaptive designs.

Assessment: 40% continuous assessment, 60% examination

ASAI4011 Natural language processing (6 credits)

Natural language processing (NLP) is a subfield of artificial intelligence, focusing on understanding human language. In essence, NLP is interested in building a tool that can use language like humans. This course will introduce the mathematical, statistical and computational challenges in natural language processing. It covers main applications of NLP techniques and a range of models in structured prediction and deep learning. In this course, students will gain a thorough introduction to cutting-edge machine learning and deep learning techniques for NLP.

Assessment: 100% continuous assessment

ASAI4013 Applied high-performance computing and parallel programming (6 credits)

High-Performance Computing (HPC) and parallel processing are ubiquitous in modern computing. The aim of this course is to provide in-demand skills and knowledge in the field of high-performance and parallel computing with hands-on parallel programming experience on real parallel machines and HPC systems. The course will begin with an introduction to HPC, including SLURM job scheduling and

fundamental HPC concepts, to prepare students to effectively use real HPC systems. Next, different parallel programming tools like MPI and OpenMP will be discussed in connection with domain-specific problems. Finally, students will explore CUDA programming for GPU acceleration, GPU architectures, and techniques for parallel training of deep neural networks.

Assessment: 60% continuous assessment, 40% examination

ASAI4022 Omics data analysis (6 credits)

This course introduces omics data acquisition techniques and emphasizes advanced statistical tools to analyze the high-throughput omics data. This course is designed for learners with basic background knowledge in molecular biology who are interested in different aspects of omics and bioinformatics. This course aims to introduce the tools and techniques needed to obtain, analyze, and interpret a variety of modern genome-scale data types.

Assessment: 60% continuous assessment, 40% examination

ASAI4023 Medical image analysis (6 credits)

Medical imaging has been a critical part in modern healthcare procedures. Its primary use is to visualize the human body at different levels (e.g., at organ, tissue, cell, and molecular levels) using different imaging modalities (e.g., those in radiology, pathology, dermatology, ophthalmology, microscopy, and genetics). The objective of this course is to provide students with an overview of the machine learning and deep learning methods in medical image processing and analytics. We will study many of the current methods used to enhance and extract useful information from medical images. A variety of medical image diagnostic scenarios will be used as examples to motivate the methods.

Assessment: 50% continuous assessment, 50% examination

COMP3320 Electronic commerce technology (6 credits)

This course aims to help students to understand the technical and managerial challenges they will face as electronic commerce becomes a new locus of economics activities. Topics include Internet and WWW technology, information security technologies, public-key crypto-systems, public-key infrastructure, electronic payment systems, and electronic commerce activities in different sectors.

Assessment: 50% continuous assessment, 50% examination

COMP3251 Algorithm design (6 credits)

The course introduces various algorithm design techniques, including divide and conquer, greedy, and dynamic programming, and studies selected topics on graph algorithms. These techniques can be used to design better algorithms in various areas of computer science. The course also gives an overview of NP-complete problems.

Assessment: 50% continuous assessment, 50% examination

COMP3252 Algorithm design and analysis (6 credits)

The course studies principles of algorithm design and the analysis of sophisticated algorithms (regarding proof of correctness and time complexity). Topics include divide-and-conquer, dynamic programming, greedy algorithms, graph algorithms, network flow, geometric algorithms, and NP-completeness. The course puts emphasis on mathematical rigor; it expects students to figure out the mathematics and logic that make algorithms work. Students can form pairs to discuss the assignments and are required to write rigorous proofs of correctness and analysis independently.

Assessment: 50% continuous assessment, 50% examination

COMP3271 Computer graphics (6 credits)

Overview of graphics hardware, basic drawing algorithms, 2-D transformations, windowing and clipping, interactive input devices, curves and surfaces, 3-D transformations and viewing, hidden-surface and hidden-line removal, shading and colour models, modelling, illumination models, image synthesis, computer animation.

Assessment: 50% continuous assessment, 50% examination

COMP3278 Introduction to database management systems (6 credits)

This course studies the principles, design, administration, and implementation of database management systems. Topics include: entity-relationship model, relational model, relational algebra, database design and normalization, database query languages, indexing schemes, integrity and concurrency control.

Assessment: 50% continuous assessment, 50% examination

COMP3340 Introduction to deep learning (6 credits)

This course provides practical skills and foundational knowledge in deep learning,

emphasizing hands-on experience and computational principles. Students will explore key models, including Convolutional Neural Networks (CNNs), Transformer Networks, Generative Adversarial Networks (GANs), and Diffusion Models. They will apply these models to real-world challenges like object detection, language tasks, and reinforcement learning. The course also covers cutting-edge applications, such as autonomous driving and AI in scientific research. By working directly with source code, students will understand model implementation and optimization deeply. The course culminates in a project where students apply their skills to a practical problem, showcasing their ability to utilize deep learning technologies.

Assessment: 50% continuous assessment, 50% examination

COMP3356. Robotics (6 credits)

This course provides an introduction to mathematics and algorithms underneath state-of-the-art robotic systems. The majority of these techniques are heavily based on probabilistic reasoning and optimization – two areas with wide applicability in modern AI. We will also cover some basic knowledge about robotics, namely geometry, kinematics, dynamics, control of a robot, as well as the mathematical tools required to describe the spatial motion of a robot will be presented. In addition, we will cover perception, planning, and learning for a robotic system, with the obstacle avoidance and robotic arm manipulation as typical examples.

Assessment: 50% continuous assessment, 50% examination

SDST3600 Linear statistical analysis (6 credits)

The analysis of variability is mainly concerned with locating the sources of the variability. Many statistical techniques investigate these sources through the use of 'linear' models. This course presents the theory and practice of these models.

Assessment: 40% continuous assessment, 60% examination

SDST3612 Statistical machine learning (6 credits)

Machine learning is the study of computer algorithms that build models of observed data in order to make predictions or decisions. Statistical machine learning emphasizes the importance of statistical methodology in the algorithmic development. This course provides a comprehensive and practical coverage of essential machine learning concepts and a variety of learning algorithms under supervised and unsupervised settings.

Assessment: 100% continuous assessment

SDST3613 Marketing analytics (6 credits)

This course is designed to provide an overview and practical application of trends, technology and methodology used in the marketing survey process including problem formulation, survey design, data collection and analysis, and report writing. Special emphasis will be put on statistical techniques particularly for analysing marketing data including market segmentation, market response models, consumer preference analysis and conjoint analysis. Students will analyse a variety of marketing case studies.

Assessment: 50% continuous assessment, 50% examination

SDST3622 Data visualization (6 credits)

This course will focus on how to work with statistical graphics, graphics that display statistical data, to communicate and analyze data. Students will learn a set of tools such as R to create these graphics and critically evaluate them.

Assessment: 50% continuous assessment, 50% examination

SDST3655 Survival analysis (6 credits)

The nature and properties of parametric and nonparametric survival models will be studied. Topics to be covered include: the introduction of some important basic quantities like the hazard function and survival function; some commonly used parametric survival models; concepts of censoring and/or truncation; parametric estimation of the survival distribution by maximum likelihood estimation method; nonparametric estimation of the survival functions from possibly censored samples by means of the Kaplan-Meier estimator, the Nelson-Aalen estimator; and the kernel density estimator or the Ramlau-Hansen estimator and comparisons of k independent survival functions by means of the generalized log-rank test; parametric regression models; Cox's semiparametric proportional hazards regression model; and multivariate survival analysis.

Assessment: 40% continuous assessment, 60% examination

SDST4601 Time-series analysis (6 credits)

A time series consists of a set of observations on a random variable taken over time. Time series arise naturally in climatology, economics, environment studies, finance and many other disciplines. The observations in a time series are usually correlated; the course establishes a framework to discuss this. This course distinguishes different type of time series, investigates various representations for the processes and studies the relative merits of different forecasting procedures. Students will analyse real

time-series data on the computer.

Assessment: 40% continuous assessment, 60% examination

SDST4602 Multivariate data analysis (6 credits)

In many designed experiments or observational studies, the researchers are dealing with multivariate data, where each observation is a set of measurements taken on the same individual. These measurements are often correlated. The correlation prevents the use of univariate statistics to draw inferences. This course develops the statistical methods for analysing multivariate data through examples in various fields of application and hands-on experience with the statistical software SAS.

Assessment: 50% continuous assessment, 50% examination

SDST4610 Bayesian learning (6 credits)

This course will provide a comprehensive introduction to the Bayesian framework for statistical inference. Students will learn how to apply advanced simulation techniques for posterior computation, which also have wider applications within statistics. This course is particularly suitable for students who intend to pursue further studies or a career in research.

Assessment: 50% continuous assessment, 50% examination

CAPSTONE EXPERIENCE COURSES

ASAI4766 Applied AI internship (6 credits)

This course is offered to BASc(AppliedAI) students who take on a minimum of 160 hours of project-driven internship work related to his/her major disciplines. It provides students with first-hand experience in the applications of academic knowledge in a real-life work environment.

Assessment: 100% continuous assessment
