



香港學術及職業資歷評審局
Hong Kong Council for Accreditation of
Academic & Vocational Qualifications

ACCREDITATION REPORT

HONG KONG SHUE YAN UNIVERSITY

LEARNING PROGRAMME ACCREDITATION

**BACHELOR OF SCIENCE WITH HONOURS IN
APPLIED DATA SCIENCE**

JANUARY 2022

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1. TERMS OF REFERENCE

1.1 Based on the Service Agreement (No.: AA748), the Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ), in the capacity of the Accreditation Authority as provided for under the Accreditation of Academic and Vocational Qualifications Ordinance (Cap. 592), was commissioned by Hong Kong Shue Yan University ('HKSJU' or 'the Operator' hereafter) to conduct a learning programme accreditation exercise with the following Terms of Reference:

- (a) To conduct an accreditation test as provided for in the AAVQO to determine whether the Bachelor of Science with Honours in Applied Data Science programme of the Operator meets the stated objectives and QF standard and can be offered as an accredited programme; and
- (b) To issue to the Operator an accreditation report setting out the results of the determination in relation to (a) by HKCAAVQ.

2. HKCAAVQ'S DETERMINATION

2.1 HKCAAVQ has determined that the Bachelor of Science with Honours in Applied Data Science programme ('BSc-ADS' or 'the Programme' hereafter) meets the stated objectives and QF standard at Level 5. Subject to the approval by the Chief Executive in Council, the Programme can be offered as an accredited programme with a validity period of five years.

2.2 In order for the validity period to take effect, HKSJU must be registered as a Post Secondary College under the Post Secondary Colleges Ordinance (Cap. 320) and it must comply with any restrictions stipulated in the Institutional Review (IR) Report. The authority for registration under Cap. 320 rests with the Permanent Secretary for Education who may take account of the outcome of the IR Report and other considerations as deemed necessary.

2.3 Validity Period

2.3.1 The validity period will commence on the date specified below. Operators may apply to HKCAAVQ to vary the commencement date of the validity period. Applications will be considered on a case-by-case basis.

2.4 The determinations on the Programme are specified as follows:

Name of Operator	Hong Kong Shue Yan University 香港樹仁大學
Name of Award Granting Body	Hong Kong Shue Yan University 香港樹仁大學
Title of Learning Programme	Bachelor of Science with Honours in Applied Data Science 應用數據科學（榮譽）理學士
Title of Qualification [Exit Award]	Bachelor of Science with Honours in Applied Data Science 應用數據科學（榮譽）理學士
Primary Area of Study and Training	Computer Science and Information Technology
Sub-area (Primary Area of Study and Training)	Computer Science and Information Technology
Other Area of Study and Training	Not applicable
Sub-area (Other Area of Study and Training)	Not applicable
QF Level	Level 5
QF Credits	500
Mode(s) of Delivery and Programme Length	Full Time, 4 years
Start Date of Validity Period	1 September 2022
End Date of Validity Period	31 August 2027
Number of Enrolment(s)	One enrolment per year

Maximum Number of New Students	<u>The first three years of operation</u> The total number: max. 40 per year of study Year 1 – 40 Year 2 – 20* (2nd to 4th years) Year 3 – 10* (3rd to 5th years) *Subject to the actual number of intake which is capped at 40 per year of study. <u>The fourth year of operation and thereafter</u> The total number: max. 60 per year of study Year 1 – 60 Year 2 – 25** (5th year) ** Subject to the actual number of intake which is capped at 60 per year of study.
Specification of Competency Standards-based Programme	☐ Yes ☒ No
Address of Teaching / Training Venue(s)	10 Wai Tsui Crescent, Braemar Hill, North Point, Hong Kong

2.5 Recommendations

HKCAAVQ offers the following recommendations for continuous improvement of the Programme:

- 2.5.1 The Panel recommended that HKSYU should review and revise the curriculum and/or pedagogic sequencing of courses with the aim of introducing a programming course in Year 1 of the BSc-ADS. (para. 4.3.4)
- 2.5.2 The Panel recommended that HKSYU should review the curriculum to ensure that they are adequately addressing the fundamentals of data visualisation, including, for example, 2D, 3D, visual perception, etc. (para. 4.3.6)

- 2.5.3 The Panel recommended that HKSYU should consider appointing one leading academic (full Professor) with mainstream experience in Data Science as soon as possible but within the next three years' time to ensure the student experience is contemporary and aligned with the needs of the industry and the latest technologies. (para. 4.5.3)
- 2.6 HKCAAVQ will subsequently satisfy itself whether the Operator remains competent to achieve the relevant objectives and the Programme continues to meet the standard to achieve the relevant objectives as claimed by the Operator by reference to, amongst other things, the Operator's fulfilment of any conditions and compliance with any restrictions stipulated in this Accreditation Report. For the avoidance of doubt, maintenance of accreditation status is subject to fulfilment of any condition and compliance with any restriction stipulated in this Accreditation Report.

3. INTRODUCTION

- 3.1 HKSYU was granted the university status in December 2006, and was the first private university in Hong Kong. It was founded in 1971 as Hong Kong Shue Yan College, has been registered under the Post Secondary Colleges Ordinance (Cap. 320) since 1976, and became a recognised private degree-awarding institution in 2001. HKSYU currently has 17 bachelor degree programmes at QF Level 5 and 18 taught and research postgraduate degree programmes up to QF Level 7.
- 3.2 HKCAAVQ formed an expert Panel for this accreditation exercise (Panel Membership at Appendix I). A site visit took place on 28-29 October 2021. With the unstable conditions of the Coronavirus pandemic, HKCAAVQ and HKSYU agreed to conduct the site visit by a combination of in-person interviews and video conferencing. The guiding document for HKSYU and the Panel in conducting this exercise was HKCAAVQ's Manual for the Four-stage Quality Assurance Process under the Hong Kong Qualifications Framework (Version 1.2, November 2020).
- 3.3 In consideration of HKSYU's track record established from previous accreditation exercises and in accordance with HKCAAVQ's

Differentiation Approach, information on the following aspects of the programme under review was not required:

Domain of Competence	Information Not Required
LPA-3 Programme Structure and Content	General Education courses

4. PANEL'S DELIBERATIONS

The following presents the Panel's deliberations on a range of issues pertinent to its major findings. For aspects of the accreditation standards where no observations are made they are considered to be appropriately addressed by the Operator.

4.1 Programme Objectives and Learning Outcomes

The learning programme must have objectives that address community, education and/or industry needs, with learning outcomes that meet the relevant HKQF standards, for all exit qualifications from the programme.

4.1.1 The Programme Aims (PAs) of the BSc-ADS are as follows:

- PA1 Equip students with a strong foundational knowledge in computing, statistics, and mathematical theories and methods in data science
- PA2 Equip students with the state-of-the-art skills and knowledge in the use of big data to offer predictions and support informed business decisions
- PA3 Nurture a distinct type of data science talent to explore how knowledge is embedded in the domain of digital humanities/social science
- PA4 Enable students to communicate insights gained from big data effectively to a diverse audience using appropriate data visualization tools
- PA5 Develop students' analytical, problem-solving, independent learning, and critical and ethical thinking

skills to solve data problems

PA6 Enable students to evaluate critically the privacy and security challenges in data science

4.1.2 The Programme Intended Learning Outcomes (PILOs) of the BSc-ADS are as follows:

- PILO1 Apply their theoretical and methodological understanding of techniques for data science, drawn from the broad disciplines of computing, mathematics, and statistics
- PILO2 Identify and analyze relevant sources of big data and assess their importance and reliability within the context of a specific domain of expertise
- PILO3 Select, adapt, apply, and communicate advanced data analytics methods and techniques
- PILO4 Apply data analytics to decision making for policy formulation in business and social development
- PILO5 Identify current issues especially socially important issues and apply data analytics to solve real-world problems
- PILO6 Critically analyse problems and identify solutions
- PILO7 Determine where and how to collect, analyse, interpret, and report data ethically
- PILO8 Build basic algorithms using appropriate languages – from data acquisition to its basic uses in machine learning
- PILO9 Utilize various analytical tools, including data mining and machine learning that transform, analyze, and interpret large-scale datasets in a wide variety of ways to show trends and make recommendations for action
- PILO10 Utilize a range of visualization methods including interactive and immersive tools on real-time data to communicate results of data analysis using virtual reality (VR), augmented reality (AR), mixed reality (MR), and extended reality (XR) technologies

- 4.1.3 HKSYU provided the Panel with the following documents to demonstrate that the BSc-ADS meets the QF standard at Level 5:
- (a) A mapping table showing the alignment between the PAs and PILOs;
 - (b) The alignment of HKSYU graduate attributes with the PAs and PILOs;
 - (c) A mapping table showing the alignment of the GLDs at QF Level 5 and the PILOs; and
 - (d) A mapping table showing the alignment between the PILOs and the courses of the BSc-ADS.
- 4.1.4 Regarding the alignment of BSc-ADS with the University's strategic plan, HKSYU elaborated that the Programme targets to immerse students in thinking about big data and its meaning for contemporary life in a broad sense associated with the aims of classical liberal arts education. The BSc-ADS is designed to meet the strong demand for data scientists who can collect, read, and analyse data in order to support informed business decision-making. HKSYU stated that the BSc-ADS emphasises teaching students how to solve problems through the analysis of big data in the business context and developing their capacity to use data analytics to derive possible solutions for issues of importance to humanity.
- 4.1.5 The BSc-ADS aims to equip students with cross-disciplinary knowledge in business applications and liberal arts. The graduates could seek academic positions as researchers or data scientists working for NGOs and government agencies as policy analysts. On the other hand, the graduates may further their studies at the postgraduate level in data science, finance, marketing, mathematics, statistics, or engineering related disciplines. Details of the intended education and employment pathways for the BSc-ADS graduates are provided in the graduate profile of the BSc-ADS in Appendix II.
- 4.1.6 After considering the above information, the Panel considered that the programme aims addressed community and education needs, and the learning outcomes corresponded to the GLDs at QF Level 5.

4.2 Learner Admission and Selection

The minimum admission requirements of the learning programme must be clearly outlined for staff and prospective learners. These requirements and the learner selection processes must be effective for recruitment of learners with the necessary skills and knowledge to undertake the programme.

- 4.2.1 The BSc-ADS has three entry points at Years 1, 2 and 3, respectively, and the minimum admission requirements are as follows:

Year 1 Standard Entry

- (a) Hong Kong Diploma of Secondary Education Examination (HKDSE) applicants must have attained:
 - English Language: Level 3 or above;
 - Chinese Language: Level 3 or above;
 - Mathematics: Level 2 or above;
 - Liberal Studies: Level 2 or above; and
 - One elective subject: Level 2 or above;
- (b) Hong Kong Associate Degree (AD) / Higher Diploma (HD) holders (of locally accredited programmes);
- (c) Three passes in GCE A-level subjects. Two AS subjects are considered to be equivalent to one A-level subject. The same subject will not be counted at both the A-level and AS-level;
- (d) International Baccalaureate (IB) Diploma with an overall minimum score of 24;
- (e) Mainland applicants reach the second batch of undergraduate scores in Mainland National Joint College Entrance Examination (NJCEE) of their corresponding provinces and municipalities; or
- (f) Other equivalent academic qualifications (subject to assessment by the University).

Additional consideration:

When considering the applicants for Year 1 entry, once the programme's minimum entrance requirements are fulfilled, the BSc-ADS adopts the Best Five Subject policy with Mathematics (Compulsory Part) inclusive for the selection decision. The

admission score will be calculated based on the total score of the best five subjects. Students who have achieved level 4 or above in the 'Extended modules in Mathematics' (i.e., Module 1 Calculus and Statistics or Module 2 Algebra and Calculus), 'Statistics', 'Computer Programming', or 'Information & Communication Technology' at HKDSE will be given additional consideration.

Year 2 Standard Entry

A graduate of a relevant (in IT/data science related area) recognised AD or HD programme in Hong Kong.

Year 3 Standard Entry

A graduate of a relevant (in IT/data science related area) recognised AD or HD programme in Hong Kong with a GPA of at least 3.0 or above.

- 4.2.2 Given the technological nature of the BSc-ADS, the Panel considered that a higher requirement on Mathematics could be set on the admission requirement to recruit students with the appropriate skills and knowledge to successfully undertake the Programme. In response to the Panel's enquiry, HKSYU stated that the admission requirements of the BSc-ADS would be in line with the University's minimum entry requirements. As one of the key components of the curriculum is digital humanities/social science, the Programme would not set a higher requirement on Mathematics in order to admit students with a liberal arts background. The BSc-ADS students who exhibit difficulties in Year 1 could attend remedial non-credit-bearing Mathematics workshops originally for FinTech and Economics & Finance students in the summer and on weekends during the regular semester.
- 4.2.3 It is noted that graduates of 'a relevant recognised AD/HD programme in Hong Kong' might be admitted into the BSc-ADS. In response to the Panel's initial comments, HKSYU defined 'a relevant programme' as one in data-science-related areas, such as IT, Engineering, Statistics, Computer Science, Mathematics, Software Development, VR, Immersive Technology, or Business Analysis. Through the Common Block Credit Transfer, students admitted to Years 2 or 3 of the BSc-ADS would be granted 38 or 62 credits, respectively. The Panel expressed concern about how the Years 2 or 3 entrants would be ensured to have possessed the necessary knowledge and skills of the major core courses, which are delivered in Year 1 and/or Year 2. During the site visit, HKSYU stated that

curriculum mapping exercises would be conducted for these applicants. In case where the curriculum mapping does not cover introductory-level core course(s) in the Year 1 curriculum of BSc-ADS, the Year 2 entrants may be required by the ADS Department to take one to two Year 1 core courses. In addition, the ADS Department will also consider arranging non-credit-bearing workshops and remedial short courses to support the learning needs of students who enter the Programme via the senior year entry routes.

4.2.4 The Panel noted that selection criteria for admission to the BSc-ADS consist of meeting the entry requirements and interview performance. An interview panel that includes the faculty of the ADS Department would be formed to interview the applicants. The Panel was provided with the details of interview performance.

4.2.5 HKSYU proposed in the following table the maximum number of new students of the BSc-ADS in the first five years of operation. For the first three years of operation, the maximum number of new students is 40 per year of study. For the fourth year of operation and thereafter, the maximum number of new students is 60 per year of study.

Year	2022/23	2023/24	2024/25	2025/26	2026/27
Year 1	40	40	40	60	60
Year 2	--	20*	20*	20*	25**
Year 3	--	--	10*	10*	10*

*Subject to the actual number of intake which is capped at 40 per year of study.

** Subject to the actual number of intake which is capped at 60 per year of study.

4.2.6 The Panel was provided with the Advanced Standing/Credit Accumulation and Transfer Policy. Applications for credit transfer/course exemption are processed by the Registry to ensure that the policy is consistently implemented. In line with the general expectation on self-financed degree-awarding institutions in safeguarding teaching and learning quality and thereby upholding the credibility and recognition of their qualifications, the maximum number of non-standard admission (including mature-aged students) for degree programmes should be capped, on a programme basis, at a maximum of 5% of the actual number of new students of the year.

4.2.7 After discussions and reviewing the above information, the Panel considered that the minimum admission requirements and the

student selection processes are appropriate and would ensure that students enrolling in the BSc-ADS would be able to undertake the learning activities and complete the Programme.

4.3 Programme Structure and Content

The structure and content of the learning programme must be up-to-date, coherent, balanced and integrated to facilitate progression in order to enable learners to achieve the stated learning outcomes and to meet the programme objectives.

4.3.1 HKSYU provided the Panel with the following documents:

- (a) A four-year curriculum of the BSc-ADS, showing Major Core, Departmental Elective, Common Core, Free Elective courses and the number of credits of each course;
- (b) Course outlines showing the Course Intended Learning Outcomes (CILOs), teaching and learning activities, assessment tasks, assessment rubric, distribution of notional learning hours, QF credits, topics, and references; and
- (c) The study plan of the BSc-ADS.

4.3.2 The BSc-ADS is made up of different components: 32 credits of Common Core Requirement courses, 60 credits of Major Core courses, and 33 credits of ADS and Free Elective courses. Students are required to complete a total of 125 credits (500 QF credits) for graduation. The ratio of contact hours to self-study hours is 1:2 for various teaching and learning activities. The table below shows the distribution of credits constituting the Programme.

Study Area	No. of Core courses (Credits)	No. of Elective courses (Credits)	Total No. of courses (Credits)	Percentage (%) (Credits)
Common Core Requirements				
<i>Languages</i>				
- Chinese	2 (8)	-	2 (8)	25.6% (32)
- English Usage	2 (6)	-	2 (6)	
- English Writing	2 (6)	-	2 (6)	
<i>General Education</i>	4 (12)	-	4 (12)	

ADS Major Core				
- Fundamentals	9 (27)		9 (27)	48.0%
- Core	9 (27)		9 (27)	(60)
- Internship	1 (3)		1 (3)	
- Capstone	1 (3)		1 (3)	
ADS and Free Electives	-	11 (33)	11 (33)	26.4%
				(33)
Total:	30 (92)	11 (33)	41 (125)	100%

4.3.3 The Panel reviewed the study plan of the BSc-ADS and observed that the number of credits changed significantly from 38 credits in Year 1, to 33 credits in Year 2, 30 credits in Year 3 and 24 credits in Year 4. The Panel was advised that this programme structure had adopted HKSYU's four-year degree programme design template. In response to the Panel's initial comments, HKSYU further explained that the total number of credits that students are required to complete in Years 3 and 4 is intentionally reduced to allow more time for extensive self-study and undertaking internships and capstone projects as required. During the site visit, HKSYU supplemented a summary of the QF credits of each core course of the Programme. The Panel noted two senior year courses *ADS403 Internship* and *ADS404 Capstone Project* each has 15 QF credits, i.e. 150 notional learning hours, whereas the majority of the courses in the BSc-ADS has 12 QF credits. Given the technological nature of this Programme, the Panel **advised** that HKSYU should review and revise the curriculum progression of the four-year study plan to avoid the heavy skewing of total number of credits and learning hours toward foundation-level studies.

4.3.4 The Panel noted that the BSc-ADS does not have a computer programming course in Year 1. The Panel pointed out that the importance of coding in a data science programme and also programming skills might be needed in some of the Year 2 courses. In response to the Panel's enquiry, HKSYU stated that students would learn basic programming skills in major core courses offered in Year 2. When the Panel suggested one new programming course could be introduced as a core course in Year 1, the Programme Team said that they would consider moving the introductory programming course to Year 1. The Panel **recommended** that HKSYU should review and revise the curriculum and/or pedagogic sequencing of courses with the aim of introducing a programming course in Year 1 of the BSc-ADS.

- 4.3.5 The Panel pointed out that five major core courses and five ADS elective courses in Years 3 and 4 have no pre-requisites. HKSYU responded to this Panel's enquiry by adding a pre-requisite for one of the major core courses and providing rationales for not requiring pre-requisite for the other nine courses. The Panel considered there is a risk that a new student could enrol in these courses and be unprepared for the advanced curriculum. The Panel **advised** that HKSYU should review the programme structure to ensure that the pre-requisites structure is appropriate.
- 4.3.6 After reviewing the BSc-ADS curriculum and comments provided by the Academic Advisory Board (AAB), the Panel noted that the not so commonly used VR/AR technologies and data visualisation techniques were selected rather than widely-used screen-based technologies and data visualisation techniques. During the site visit, the Programme Team said that information visualisation concepts and skills are already taught in courses other than the three core VR/AR courses. However, the Panel considered there was insufficient information provided in the accreditation documents and encouraged the teaching staff to check the curriculum to ensure that screen-based technologies and data visualisation techniques are taught and are adequately addressing the fundamentals of data visualisation. The Panel **recommended** that HKSYU should review the curriculum to ensure that they are adequately addressing the fundamentals of data visualisation, including, for example, 2D, 3D, visual perception, etc.
- 4.3.7 Given the scope of the capstone project and its importance to the Programme, the Panel considered it seems quite low for the *ADS404 Capstone Project* to be three credits only. The Programme Team explained that the capstone project is a continuation of the *ADS403 Internship*, which lasts for three months. Although these are two separate courses, students are required to identify a topic for their capstone project with their internship supervisors. The Panel noted that students could be brainstorming project ideas during their internship, but they might not commence any work on their capstone project. Also, students might request continuing the capstone project in the second semester if they do not have enough time to complete it during the first semester. In this connection, the Panel considered that three credits are not an adequate representation of the time required for a capstone project. Given the very different nature of the BSc-ADS compared to other programmes of HKSYU and the scope of the Capstone Project and its importance to the Programme, the Panel **advised** that HKSYU should consider turning the Capstone Project course into a 6-credit course or two 3-credit courses. In

addition, the Panel **advised** that HKSYU should review and clarify the linkage between the internship and capstone project and their relationship with the industry.

- 4.3.8 Notwithstanding the recommendations and advice, the Panel considered that the content and structure of the Programme is current and integrated to ensure students are able to achieve the stated learning outcomes and meet the programme aims.

4.4 **Learning, Teaching and Assessment**

The learning, teaching and assessment activities designed for the learning programme must be effective in delivering the programme content and assessing the attainment of the intended learning outcomes.

- 4.4.1 For the BSc-ADS, English is the medium of instruction (MOI). The Programme employs a variety of learning and teaching methods, such as lectures, laboratories, tutorials, peer-reviewed group projects, and case studies. The table below shows the maximum number of students in various modes of teaching.

Modes of teaching	Maximum number of students
Classroom lecture	40-60
Laboratory session	30
Tutorial	20

- 4.4.2 The BSc-ADS uses a variety of methods to assess students' performance. These methods include examination, quiz, assignment, group project, presentation, and laboratory report. To illustrate the standards of the Programme, HKSYU provided the following information to the Panel:

- (a) Teaching and learning activities of the Programme;
- (b) Assessment methods adopted in each course and their relative weighting;
- (c) Assessment criteria for different kinds of assessment tasks; and
- (d) Sample assessments from courses in the four key areas of the Programme.

4.4.3 The graduation requirements of the BSc-ADS are as follows.

To graduate a student must have

- (i) attained a Total Grade Point Average of 2.0 or above;
- (ii) obtained the required credits as stipulated in the student's programme curriculum before graduation; and
- (iii) successfully completed all the compulsory, elective, major, General Education and minor courses (if applicable) required by the Department concerned.

4.4.4 The degree honours classification of the BSc-ADS:

Classification	Minimum overall grade point average (GPA)
First Class Honours	3.4
Second Class Honours Upper Division	3.0
Second Class Honours Lower Division	2.5
Third Class Honours	2.2
Pass	2.0

4.4.5 Based on the information provided on learning, teaching and assessment activities designed for the BSc-ADS programme, the Panel confirmed that HKSYU had demonstrated their effectiveness in delivering the programme content and assessing the attainment of the PILOs.

4.5 **Programme Leadership and Staffing**

The Operator must have adequate programme leader(s), teaching/training and support staff with the qualities, competence, qualifications and experience necessary for effective programme management, i.e. planning, development, delivery and monitoring of the programme. There must be an adequate staff development scheme and activities to ensure that staff are kept updated for the quality delivery of the programme.

4.5.1 The BSc-ADS is hosted by the ADS Department. The Programme Director is the Head and a Professor in the host department and also one of the academic staff of the Programme. HKSYU provided to the Panel the following documents:

- (a) the teaching staff deployment plan for the BSc-ADS;
- (b) the curriculum vitae of the Programme Director and full-time teaching staff of the BSc-ADS; and
- (c) the projected manpower plan from 2022/23 to 2025/26.

Post by Ranks	Projected Staff Numbers			
	2022/23	2023/24	2024/25	2025/26
Professor	1	1	1	1
Associate Professor	0	1	1	1
Assistant Professor	3	4	5	6
Adjunct Professor	0	0	3	3
Part-time Lecturer	0	0	3	9
Administrative Assistant (Senior)	1	1	1	1
Administrative Assistant	0	1	1	1
Technical Officer	1	1	1	1
Technical Assistant	0	1	1	1

- 4.5.2 With respect to staffing, the Panel noted that the planned student-teacher ratio (STR) for the BSc-ADS would be 20. The Panel noted that four currently serving full-time (FT) academic staff of the host department would be engaged in teaching the Programme. Additionally, one new Associate Professor, three new Assistant Professors, three Adjunct Professors and nine part-time lecturers with specialisations in different and relevant areas would be employed to manage the teaching load in the longer term.
- 4.5.3 The Panel noted that the Programme Director of the BSc-ADS is a highly experienced and successful academic in communications. In response to the Panel's enquiry whether HKSYU intends to appoint another professor who is directly aligned with the core of the Programme, HKSYU stated that the ADS Department plans to hire four additional FT professors (one at Associate and three at Assistant Professors rank) from 2023 to 2026. The Panel **recommended** that HKSYU should consider appointing one leading academic (full Professor) with mainstream experience in Data Science as soon as possible but within the next three years' time to ensure the student experience is contemporary and aligned with the needs of the industry and the latest technologies.
- 4.5.4 The Panel noted that HKSYU provided a number of staff development opportunities, such as training/sharing workshops and a department retreat to enhance teaching and learning activities.

Funding has been allocated for FT teaching staff to attend conferences, workshops, and seminars held internationally, regionally, and locally to keep their knowledge current. On the other hand, academic staff are also provided with funding for conducting research, such as the University Research Grant which serves as a small start-up grant for academic research. Academic staff are also provided coaching and support in applying for external grants, such as grants offered by the Research Grants Council.

- 4.5.5 Given the information provided in the documentation and discussions during the site visit, the Panel considered that BSc-ADS would have adequate teaching staff with the necessary competence, qualifications and experience to deliver the Programme. There are also appropriate staff development schemes and activities in place to ensure that staff are kept updated for the quality delivery of the Programme.

4.6 **Learning, Teaching and Enabling Resources/Services**

The Operator must be able to provide learning, teaching and enabling resources/services that are appropriate and sufficient for the learning, teaching and assessment activities of the learning programme, regardless of location and mode of delivery.

- 4.6.1 On financial resources for the BSc-ADS, the Panel was provided with a projection of the income and expenditure for the initial five years of operation of the Programme. The Panel reviewed the budget for equipment, software, technical and laboratory support for the Programme. In response to the Panel's enquiry, HKSYU stated that the University is committed to operating the BSc-ADS for at least eight cohorts even in the case of under-enrolment of the Programme. As such, the Panel was of the view that HKSYU has adequate financial resources to support the operation of the Programme.
- 4.6.2 Regarding the laboratories to support the BSc-ADS, the Panel was informed that there are three laboratories, of which, Big Data Laboratory and Virtual Reality Laboratory have been established, and the Data Visualization Laboratory would be set up. The Panel reviewed the lists of data resources and software licenses to support the teaching and learning activities of the Programme. The Panel **advised** that HKSYU should consider acquiring adequate computing resources (e.g. GPU/cloud computing) to support teaching and learning facilities (in the Big Data Laboratory) provided to all students of the BSc-ADS.

- 4.6.3 The lists of current and planned library acquisitions and e-resources relevant to the BSc-ADS have been provided by HKSYU. The Panel acknowledged HKSYU's investment and the responsiveness of the library to the Programme.
- 4.6.4 The Panel noted that students who are making unsatisfactory progress or have academic problems are identified at the meetings of the Departmental Boards of Examiners at the end of each semester. In response to the Panel's enquiry, HKSYU stated that each Department adopts appropriate supportive measures to help these students make academic improvements, for example, academic consultation and mentorship by the lecturers to provide guidance. The Panel noted there are currently four student counsellors providing individual counselling services for students who are going through personal difficulties and emotional distress.
- 4.6.5 Considering the above information, and notwithstanding the advice, the Panel considered that HKSYU provided appropriate and sufficient resources for the learning and teaching activities for the BSc-ADS.

4.7 **Programme Approval, Review and Quality Assurance**

The Operator must monitor and review the development and performance of the learning programme on an on-going basis to ensure that the programme remains current and valid and that the learning outcomes, learning and teaching activities and learner assessments are effective to meet the programme objectives.

- 4.7.1 The Panel noted that HKSYU adopts internal and external quality assurance (QA) processes to monitor learning programmes to ensure to achieve the learning outcomes. The Panel reviewed a range of documents, including the minutes of Academic Board (AB), Academic Advisory Board (AAB), and Quality Assurance Committee (QAC), outlining the discussions, decisions and approvals in relation to the Programme and demonstrating the implementation of the QA system specific to the BSc-ADS. The Panel observed that these board/committees had provided various inputs for the development of the proposed BSc-ADS and they had been followed up by ADS Department, for instance, the AAB's comments on the accreditation documents.

- 4.7.2 Regarding the internal QA system, the BSc-ADS Curriculum Committee is responsible for closely monitoring the delivery of courses in the four key areas: (1) ADS Fundamentals, (2) Business Analytics, (3) Digital Humanities/social science, and (4) Data Visualisation. The Programme Committee (PC) is responsible for reporting on the progress and status of the Programme to the Departmental Committee (DC) of the ADS. All decisions contributing to the overall quality of the Programme will be discussed at the DC of the ADS Department. The PC is responsible for compiling an Annual Programme Review Report for consideration by QAC and AB.
- 4.7.3 Prior to seeking HKCAAVQ's accreditation, QAC appointed an External Programme Assessor (EPA) to review the BSc-ADS proposal. The Panel noted the departmental responses to the EPA Report. The AAB for the BSc-ADS comprised three external academics and three advisors from the industry as members. The AAB is responsible for giving advice related to the programme structure and course content of the BSc-ADS. During the site visit, the Panel discussed the QA processes with both internal and external stakeholders. The QA processes were well documented, explained and evidenced.
- 4.7.4 The Panel concluded that HKSYU has clear and comprehensive QA processes. These support the delivery, continuous development and monitoring of the Programme to ensure that the learning outcomes, learning and teaching activities and learner assessments are effective in meeting the programme aims.

5. IMPORTANT INFORMATION REGARDING THIS ACCREDITATION REPORT

5.1 Variation and withdrawal of this Accreditation Report

- 5.1.1 This Accreditation Report is issued pursuant to section 5 of the AAVQO, and contains HKCAAVQ's substantive determination regarding the accreditation, including the validity period as well as any conditions and restrictions subject to which the determination is to have effect.
- 5.1.2 HKCAAVQ may subsequently decide to vary or withdraw this Accreditation Report if it is satisfied that any of the grounds set out in section 5 (2) of the AAVQO apply. This includes where HKCAAVQ is satisfied that the Operator is no longer competent to achieve the

relevant objectives and/or the Programme no longer meets the standard to achieve the relevant objectives as claimed by the Operator (whether by reference to the Operator's failure to fulfil any conditions and/or comply with any restrictions stipulated in this Accreditation Report or otherwise) or where at any time during the validity period there has/have been substantial change(s) introduced by the Operator after HKCAAVQ has issued the accreditation report(s) to the Operator and which has/have not been approved by HKCAAVQ. Please refer to the '*Guidance Notes on Substantial Change to Accreditation Status*' in seeking approval for proposed changes. These Guidance Notes can be downloaded from the HKCAAVQ website.

5.1.3 If HKCAAVQ decides to vary or withdraw this Accreditation Report, it will give the Operator notice of such variation or withdrawal pursuant to section 5(4) of the AAVQO.

5.1.4 The accreditation status of Operator and/or Programme will lapse immediately upon the expiry of the validity period or upon the issuance of a notice of withdrawal of this Accreditation Report.

5.2 Appeals

5.2.1 If the Operator is aggrieved by the determination made in this Accreditation Report, then pursuant to Part 3 of the AAVQO the Operator has a right of appeal to the Appeal Board. Any appeal must be lodged within 30 days of the receipt of this Accreditation Report.

5.2.2 If the Operator is aggrieved by a decision to vary or withdraw this Accreditation Report, then pursuant to Part 3 of the AAVQO the Operator has a right of appeal to the Appeal Board. Any appeal must be lodged within 30 days of the receipt of the Notice of Withdrawal.

5.2.3 The Operator should be aware that a notice of variation or withdrawal of this Accreditation Report is not itself an accreditation report and the right to appeal against HKCAAVQ's substantive determination regarding accreditation arises only from this Accreditation Report.

5.2.4 Please refer to Cap. 592A (<http://www.legislation.gov.hk>) for the appeal rules. Details of the appeal procedure are contained in section 13 of the AAVQO and can be accessed from the QF website at <http://www.hkqf.gov.hk>.

5.3 **Qualifications Register**

- 5.3.1 Qualifications accredited by HKCAAVQ are eligible for entry into the Qualifications Register ("QR") at <http://www.hkqr.gov.hk> for recognition under the QF. The Operator should apply separately to have their quality-assured qualifications entered into the QR.
- 5.3.2 Only learners who commence the study of the named accredited learning programme during the validity period and who have graduated with the named qualification listed in the QR will be considered to have acquired a qualification recognised under the QF.

Ref: 40/32/01

3 January 2022

JoH/SF/FiL/VT/smt

Hong Kong Shue Yan University

**Learning Programme Accreditation for
Bachelor of Science with Honours in Applied Data Science**

28-29 October 2021

Panel Membership

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* The Panel Secretary is also a member of the Accreditation Panel

Appendix II

Graduate Profile of Bachelor of Science with Honours in Applied Data Science

Qualification Title	Bachelor of Science with Honours in Applied Data Science 應用數據科學(榮譽) 理學士
Qualification Type	Bachelor Degree
QF Level	Level 5
Primary Area of Study and Training	Computer Science and Information Technology
Sub-area (Primary Area of Study and Training)	Computer Science and Information Technology
Programme Aims	1. Equip students with a strong foundational knowledge in computing, statistics, and mathematical theories and methods in data science 2. Equip students with the state-of-the-art skills and knowledge in the use of big data to offer predictions and support informed business decisions 3. Nurture a distinct type of data science talent to explore how knowledge is embedded in the domain of digital humanities/social science 4. Enable students to communicate insights gained from big data effectively to a diverse audience using appropriate data visualization tools 5. Develop students' analytical, problem-solving, independent learning, and critical and ethical thinking skills to solve data problems 6. Enable students to evaluate critically the privacy and security challenges in data science
Programme Intended Learning Outcomes	1. Apply their theoretical and methodological understanding of techniques for data science, drawn from the broad disciplines of computing, mathematics, and statistics

	2. Identify and analyze relevant sources of big data and assess their importance and reliability within the context of a specific domain of expertise 3. Select, adapt, apply, and communicate advanced data analytics methods and techniques 4. Apply data analytics to decision making for policy formulation in business and social development 5. Identify current issues especially socially important issues and apply data analytics to solve real-world problems 6. Critically analyse problems and identify solutions 7. Determine where and how to collect, analyse, interpret, and report data ethically 8. Build basic algorithms using appropriate languages – from data acquisition to its basic uses in machine learning 9. Utilize various analytical tools, including data mining and machine learning that transform, analyze, and interpret large-scale datasets in a wide variety of ways to show trends and make recommendations for action 10. Utilize a range of visualization methods including interactive and immersive tools on real-time data to communicate results of data analysis using virtual reality (VR), augmented reality (AR), mixed reality (MR), and extended reality (XR) technologies
Education Pathways	After completion of the proposed Programme, graduates may pursue further studies in a variety of postgraduate programmes offered by universities in Hong Kong and overseas. Such programmes may relate to the fields of data science, finance, marketing, mathematics, statistics, and engineering.
Employment Pathways	Graduates will be well positioned to work as a data analyst, data scientist, data statistician, data

	analytics consultant, digital marketing manager, quantitative analyst, operations analyst, transportation logistics specialist, project manager, business intelligence professional, machine learning scientist, data visualization developer, audience insights analyst, and market researcher in almost all job sectors. Besides business and commercial sectors, graduates can also seek academic positions as researchers or data scientists working for NGOs, Think Tanks, and government agencies as policy analysts.
Minimum Admission Requirements	<u>Year 1 Standard Entry</u> (a) Hong Kong Diploma of Secondary Education Examination (HKDSE) applicants must have attained: - English Language: Level 3 or above; - Chinese Language: Level 3 or above; - Mathematics: Level 2 or above; - Liberal Studies: Level 2 or above; and - One elective subject: Level 2 or above; (b) Hong Kong Associate Degree (AD) / Higher Diploma (HD) holders (of locally accredited programmes); (c) Three passes in GCE A-level subjects. Two AS subjects are considered to be equivalent to one A-level subject. The same subject will not be counted at both the A-level and AS-level; (d) International Baccalaureate (IB) Diploma with an overall minimum score of 24; (e) Mainland applicants reach the second batch of undergraduate scores in Mainland National Joint College Entrance Examination (NJCEE) of their corresponding provinces and municipalities; or (f) Other equivalent academic qualifications (subject to assessment by the University).

	<u>Additional consideration:</u> When considering the applicants for Year One entry, once the programme's minimum entrance requirements are fulfilled, the BSc-ADS adopts the Best Five Subject policy with Mathematics (Compulsory Part) inclusive for the selection decision. The admission score will be calculated based on the total score of the best five subjects. Students who have achieved level 4 or above in the 'Extended modules in Mathematics' (i.e., Module 1 Calculus and Statistics or Module 2 Algebra and Calculus), 'Statistics', 'Computer Programming', or 'Information & Communication Technology' at HKDSE will be given additional consideration. <u>Year 2 Standard Entry</u> A graduate of a relevant (in IT/data science related area) recognised AD or HD programme in Hong Kong. <u>Year 3 Standard Entry</u> A graduate of a relevant (in IT/data science related area) recognised AD or HD programme in Hong Kong with a GPA of at least 3.0.
Operator	Hong Kong Shue Yan University

