IOA

Institute of Analytics

The Global Body for Analytics

Accreditation Criteria

IoA | Data Science & Analytics
Recognized Postgraduate Programmes

www.ioaglobal.org

INTRODUCTION

The rapid development of the field of Data Science & Analytics and the demand for these skills in the jobs market have created a need for recognition of professional education.

The Institute of Analytics (IoA) considers it appropriate to develop core training requirements for those seeking employment in the Data Science & Analytics field. Programmes which meet those requirements will be eligible to apply for IoA Recognized Postgraduate Programme status. Satisfactory completion of an IoA Recognized Postgraduate Programme automatically meets the educational requirements for IoA membership as an Associate Member (other conditions apply).

The criteria are intended to respect the independence and diversity of the field of Data Science & Analytics, while ensuring that employers can assume certain quality standards among students graduating from an accredited course of study. It is hoped that the opportunity to acquire IoA Recognized Postgraduate Programme status will encourage staff and Higher Education Providers to monitor, develop and enhance their performance in ways that lead to a global body of quality education providers.

Accreditation can be awarded for a 5-year period, subject to brief annual renewal, to those courses which make an application and meet the minimum requirements, conforming to the criteria outlined below.

The IoA acknowledges that Data Science & Analytics is a fast-moving field. At annual renewal, the course providers will be required to submit a brief report and inform the IoA of any substantial[1] changes to the programme content for the following year.

Programme accreditation is for specific programmes of study rather than institutions. If an institution runs two or more relevant programmes but with different content, an application for accreditation needs to be made for each programme.

Programmes which have completed the accreditation process and have received confirmation of their accredited status may include the words 'IoA Recognized Postgraduate Programme[2]' and may display the IoA Recognized Postgraduate Programme logo on their publicity material for that specific accredited course only after accreditation has been awarded and while accreditation is current.

---

[1] A substantial change would be any change where an entire program requirement is removed from the accredited program.

[2] It is the responsibility of the program provider to communicate the full accreditation requirements. In the case where accreditation is awarded to programs with optional modules, the requirements to complete all modules must be made clear.

PART 1 - REQUIREMENTS FOR POSTGRADUATE PROGRAMME ACCREDITATION

1.1 All students on an IoA Recognized Postgraduate Programme are welcome to be Student Members of the IoA. Students who already met the requirements of Graduate Membership, i.e. successful completion of an IoA Recognized Undergraduate Programme, may continue at this level of membership during their studies.

1.2 Applications for accreditation for the postgraduate track will be welcomed from Higher Education Providers that are either Degree Awarding or are in Partnership with Degree Awarding Institutions as per the local law. In addition, programmes must be a minimum ISCED Level 7 or above (or local equivalent) and instruction in at least one of the Core Knowledge Requirements specified in Section 6 must constitute not less than 20% of the course content.

1.3 An IoA Recognized Postgraduate Programme must provide an appropriate mix of theoretical training in the field of Data Science & Analytics, practical experience of applying data solutions to real world problems, and an extended project.

1.4 On application, any information, course specifications, leaflets, brochures, advertisements, etc. supplied to the public must be made available to the IoA.

1.5 The programme should be subject to moderation processes and have an external examiner, normally appointed by the institution or course provider. The external examiner needs to be independent and unbiased. The external examiner must be appropriately qualified and have experience assessing comparable programmes. The external examiner should have no current association with, or current personal or business relationship with, the programme staff or trainees.

1.6 There must be a clear written complaints procedure available to students, staff, and other training supporters, such as placement providers. The course provider has ultimate responsibility for complaints.

1.7 Programmes are subject to the IoA's Code of Ethics and Practice

1.8 All programmes must have written policies in place for the duty of care to students in the eventuality that the programme ceases to be offered before completion of graduation requirements.

2. ADMISSION PROCESS

2.1 There are no minimum or maximum student numbers required at intake.

2.2 Prospective students should be provided with detailed and accurate information about the programme, including its structure, aims, staffing, content, assessment requirements, fees including any 'extras', e.g. exam and certificate fees, and conditions of participation, e.g. time commitment or equipment requirements.

2.3 The procedure for selection should be clearly explained and be consistent with the course rationale, design and methodology.

3. STAFF

Programme providers are accountable for the work of all staff.

3.1 Programme staff shall monitor all trainers and supervisors.

3.2 Core Staff members are members of programme staff who have ultimate responsibility for the programme and for the experience, well-being, and advancement of students. Core Staff members are expected to liaise regularly with all programme staff, visiting lecturers and external supervisors. Core Staff members are also directly involved in admission, course management, assessment and content oversight.

3.3 There must be at least two staff team members nominated as Core Staff for each iteration of the programme, e.g. one cohort of an MSc programme.

3.4 Core Staff and other relevant training personnel, e.g. technical assistants, on an accredited programme may apply for membership of the IoA at the level appropriate to their qualifications and experience.

3.5 Core Staff must be familiar with and agree to work within the current version of the IoA's Code of Ethics and Practice. Copies of the Code of Ethics and Practice are available from IoA.

4. COURSE RATIONALE AND DESIGN

4.1 Programmes should provide a clear statement of the programme rationale and design, including methods and practical exercises, which is consistent with the actual structure of the programme and closely related to the accreditation requirements listed in this document.

4.2 All programmes should provide evidence of ability in each Core Knowledge Requirement listed in Section 6.

4.3 There should be a balance between theory and practice on the programme.

PART 2 - PROGRAMME CONTENT

While the IoA acknowledges that Data Science & Analytics is a field defined by multiple areas of specialisation and dynamic change, it is fundamental to stakeholders that core training in the fundamentals of Data Science & Analytics be provided by all accredited programmes. For that reason, all IoA Recognized Postgraduate Programmes must ensure that students are skilled in the Core Knowledge Requirements either on commencement or by completion of their programme. There is an additional Core Requirement of an extended project for postgraduate programmes.

5. PROGRAMME DEFINITION

5.1 Programme applications with compulsory analytics content

For postgraduate accreditation, a programme of study is taken to mean a programme that leads to a Masters' award, e.g. an MSc in Data Science & Analytics. This may include courses where compulsory Data Science & Analytics content is embedded as part of a wider course of study, e.g. an MBA in Business Analytics, in addition to stand-alone, focused Data Science & Analytics courses. A programme will be deemed to be qualifying provided that all students have completed substantial work (no less than 20% of the total programme content) in analytics instruction as defined in the Core Knowledge Requirements below.

5.2 Programme applications with optional analytics content

Where component parts that add up to completion of the core requirements are optional in a programme of study, e.g. an MSc in Computer Science, students will be eligible for IoA Associate Membership provided that they have completed the required options. In such circumstances, students may need to provide additional support in the form of study transcripts or a letter of confirmation from their programme providers. Components of a programme will be deemed to be qualifying provided that all students have completed substantial work (no less than 20% of the total programme content) in analytics instruction as defined in the Core Knowledge Requirements below.

6. THE CORE KNOWLEDGE REQUIREMENTS

At postgraduate level, students are likely to have prior experience of Data Science & Analytics. While it is NOT a requirement at postgraduate level that students receive specific instruction in the individual components below during their course of study, it is the responsibility of the programme provider to ensure that, on graduation, students have had the opportunity to demonstrate familiarity with the concepts and, where appropriate, have had practical experience of the requirements below.

6.1 Core Knowledge Requirement 1   Data collection and database maintenance

Theory of database structures (e.g. relational, document or graph models)

Database schema design and use

Data collection and provenance

Basic initial exploratory data analysis

Data sampling theory and application

6.2 Core Knowledge Requirement 2   Data cleaning

Theory of data cleaning, validation, data integrity (accuracy, consistency etc.) and ongoing quality assurance

Handling duplicate data and missing data

Theory and practice of normalization or the removal of outliers

Theory and practice of handling database joining

6.3 Core Knowledge Requirement 3   Data modelling

Theory and practice of models on large data sets

Theory of compromises and payoffs of data models[3]

6.4 Core Knowledge Requirement 4   Data Visualization

Theory of data visualization and visual deception

Practice of data visualization design

6.5 Core Knowledge Requirement 5   Working with data output

Theory of correlation and causality

Production, validation, and interpretation of model output

Practical description of modelling processes for a non-technically trained audience

---

[3] Examples could include theories such as CAP theorem, or the payoff between recall and precision in categorization algorithms.

6.6 Core Knowledge Requirement 6   Data Ethics

Theory of relevant privacy laws and/or privacy regulatory environment[4]

Theory of intellectual property laws

Theory and/or practice of integrity constraints on data modelling[5]

Theory of trust, reputation, and unanticipated outcomes[6]

Practice completing a data ethics report

6.7 Core Requirement   Extended Project work

For programmes accredited at the postgraduate level, students are required to complete an extended project. In that project, the student must demonstrate a familiarity with the previous work in the field and must demonstrate the ability to organize study; carry out practical research; present results; and reach appropriate conclusions.

6.8 It is not anticipated that the Core Requirements for IoA accreditation will change in the short term. However, given the rapid development of new technologies relevant to the field, and the large number of research technologies currently close to maturity, the IoA reserves the right to update the Core Requirements as needed in response to emerging technologies and legislative environments. An 18-month period of notification and support will be given to all accredited suppliers in the unlikely event of a change, to allow programme providers to adjust to the new requirements. Support can be agreed with the IoA on a case-by-case basis.

---

[4] NB This may be regionally and sector dependent. E.g. Those working in the European Union will require training on the main points of the General Data Protection Regulation (GDPR). Those on accredited courses within the FinTech industry will be required to be trained on regulations within financial markets.

[5] An example of an integrity constraint on data modelling might be the ethical constraints when applying the output of deep learning algorithms with poor transparency in decisions that have a significant impact on real life, such as school leaving exam results.

[6] For an example of a relevant theoretical approach to ethics, see the IoA 10 Steps model, or IEEE Ethics by design.

7. CODING AND SOFTWARE REQUIREMENTS

The IoA is platform agnostic, and will accept any relevant language, software or programming tool for Data Science & Analytics.

7.1 An example of currently recognized languages and software is available from the IoA, but this is not an exhaustive list. If a course provider wishes to use a tool not currently on the list, please inform the IoA Accreditation Team.

7.2 Programme providers are required to submit details of the software and languages used for practical work during the application process. Where necessary, we will add new additions to our list of approved 3rd party tools provided that they meet our criteria below (7.3). We will not require details at the level of library packages etc..

7.3 In the unlikely event of a rapid degradation of the base code or other tool, that tool will be deemed no longer relevant, and the IoA will take the decision to remove this from our list of approved 3rd party tools. The IoA will endeavour to provide an 18-month warning of this, but in the exceptional circumstance of a major and immediate platform failure, the IoA reserves the right to update the list at any time.

8. METHODS

8.1 Course staff are required to take responsibility for providing a range of learning experiences congruent with the topic of instruction. The programme should include:

(i) Opportunities for individual work

(ii) Opportunities for group work

(iii) Theoretical instruction

(iv) Research skills

(v) Practical application of technologies

(vi) Report writing

(vii) Access for each student to staff for support

8.2 In addition, course providers must offer ongoing opportunities for staff and students to meet to reflect on all aspects of the programme.

9. THE EMERGING LANDSCAPE IN DATA SCIENCE & ANALYTICS AND POSTGRADUATE PREPARATION

It is important that students are given support to identify forms of ongoing professional development after they graduate.
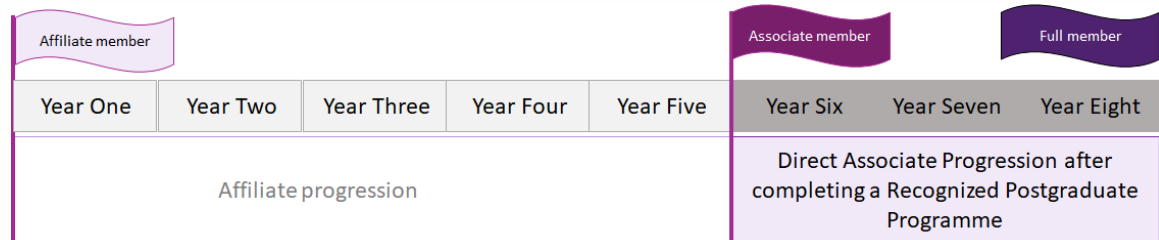
9.1 Students should be introduced to crowd sourced support such as discussion forum support, as a major tool of the data analyst.[7]

9.2 Students must be given the opportunity to discuss post-completion options to stay up to date in the field of Data Science & Analytics.

9.3 Core Staff are expected to review the relevance of their content on a regular basis to ensure that the contents reflect current best practice, introduce novel tools as and when appropriate, and if necessary, retire outdated tools.

9.4 IoA Membership and Progression

Students currently studying on an IoA Recognized Postgraduate Programme automatically qualify for Student Membership of the IoA if they are new to the IoA. Existing members may keep their current membership grade if they prefer. On successful completion of an IoA Recognized Postgraduate Programme, they can apply directly for Associate membership.

Affiliate member					Associate member		Full member
Year One	Year Two	Year Three	Year Four	Year Five	Year Six	Year Seven	Year Eight
Affiliate progression					Direct Associate Progression after completing a Recognized Postgraduate Programme		

The IoA expect programme providers to encourage students to take up Student Membership and Associate membership as part of their ongoing plans for career progression. The IoA will be happy to support organizations in promoting membership to students.

Please see the IoA Analyst Competency Framework for full details of the key competencies that we expect our members to be developing at each level and for the criteria for relevant work experience.

---

[7] An example of this might be github, stackoverflow or similar in local language.

10. ASSESSMENT

10.1 A programme must adopt a method of assessment that is congruent with the aims and objectives of the programme.

10.2 Students must be fully informed of the assessment procedures and the criteria used. They should also be given progress reports at various stages during the course of study for accredited programmes or accredited component modules of a duration in excess of 12 weeks.

10.3 There must be a substantive emphasis on the assessment of competence in applying Data Science & Analytics to real-world data sets and data problems. This may be achieved by making use of open data sets.

10.4 External supervisors' reports must form an integral part of ongoing assessment practices.

10.5 All assessments must be in line with academic standards appropriate to the level of study, and be clear and consistent with the learning intentions, which must be made available to students.

10.6 Programme organizers must provide details of the procedure for deferrals, late submissions, extensions and absences.

10.7 A complaints procedure must be in place and be made available to the students and members of staff.

10.8 An appeals procedure must be available for students.

PART 3 - THE ACCREDITATION PROCESS

Before applying for accreditation, programme providers should familiarize themselves with the programme accreditation procedures above.

11. Application

A programme provider wishing to apply for Accreditation should supply the following in the first instance:

(i)   A completed application form.

(ii)   Copies of any explanatory or promotional material such as programme specification documentation to be used with the programme to be accredited.

(iii)   Confirmation that the terms and conditions of accreditation have been read and agreed by the applying body.

12. Accreditation

The information submitted will be considered by the IoA. If the application meets initial requirements, a representative of the IoA will submit a formal recommendation report.

The IoA reserves the right, as deemed necessary, to refuse accreditation or require amendments to the programme for accreditation to be approved. In such circumstances, we will communicate this to the programme provider at the earliest opportunity and agree the terms for re-submission should the programme providers wish to do so.

Once a formal decision is taken, confirmation will be sent to the programme provider.

Programme accreditation by the IoA will last for five years, subject to annual ongoing monitoring by IoA, after which programme providers must reapply for accreditation.

13. Membership and accreditation

All students registered on an IoA Recognized Postgraduate Programme automatically qualify for Student Membership, and we expect recognized programme providers to encourage students to take up membership. The IoA can support programme providers in promoting membership. Those students who already hold or qualify for Graduate Membership, i.e. by successful completion of an IoA Recognized Undergraduate Programme, may maintain this level of membership during their programme.

To qualify for Associate Membership on graduation, all students of an IoA Recognized Postgraduate Programme, regardless of their prior membership status, must have attended and successfully completed their accredited programme during a specified period of

accreditation. In the instance that a programme is awarded accreditation halfway through a student's pre-existing studies, they will be deemed to have completed an accredited course provided no amendments have been made to the course content since the start of the period of study. See Section 13 below for information about withdrawal of accreditation.

Programmes which have completed the accreditation process and have received confirmation of their accredited status may include the words 'IoA Recognized Postgraduate Programme[8]' and may display the IoA Recognized Postgraduate Programme logo on their publicity material for that specific accredited course only after accreditation has been awarded and while accreditation is current. In the case of the intention to apply for IoA accredited status, a lapse of accreditation, or former existence of IoA accredited status, statements may not appear in any publicity material around the course. Programme accreditation status is non-transferable.

14. Accreditation not Awarded

In the case of accreditation not being awarded, a final report and letter will be sent to the programme provider notifying of this outcome.

The IoA reserves the right not to award accreditation in relation to a programme where there exist circumstances which lead the IoA to believe that the programme content or delivery are incompatible with the standards and ethos promoted by the IoA. This is a discretionary right of the IoA.

Monitoring of the programme after accreditation

The IoA will continue to monitor the programme after accreditation. To support this, it is essential that Accredited Programmes appoint two Core Staff Members and if necessary one additional administrator to liaise with the IoA.

The role of the liaison person will be to submit yearly reports informing the IoA about the continuance of, and any changes to, the programme. This report falls due one year after accreditation is awarded.

Sanctions and withdrawal of accreditation

Failure to meet the criteria will result in the suspension or complete withdrawal of IoA accreditation. Accreditation of a programme may be completely withdrawn or suspended by the IoA at any time if:

(i)   Programme criteria are not met
(ii)   Standards are not maintained

---

[8] It is the responsibility of the program provider to communicate the full accreditation requirements. In the case where accreditation is awarded to programs with optional modules, the requirements to complete all modules must be made clear.

Any misleading or inaccurate information that is given to the IoA will result in a programme being withdrawn from the Course Accreditation Process.

In the event that accreditation is withdrawn from a programme halfway through studies, existing student members on the programme will be contacted by the IoA, and we will endeavor to find a mutually satisfactory resolution.

In addition, the IoA reserves the right to consider any unusual behaviour by those providing the programme or any of its employers or agents, as a breach of the standard expected by the IoA.

In the event that the Recognized Programme owner has an Approved Learning Partnership agreement with another learning provider, it will be the responsibility of the programme owner, not the IoA, to discuss the withdrawal of accreditation.

PART 4 - RENEWAL OF PROGRAMME ACCREDITATION

Re-Accreditation

An IoA accredited programme may seek re-accreditation by providing written evidence that the programme continues to meet the current minimum standards for accreditation. The written submission should include the following:

(i) Renewal form completed, and the application must be submitted to the IoA at least 3 months before the date of expiry of current 5-year accreditation. This will include any changes to the programme content, direction, duration and format.

(ii) Particulars of any changes in relation to the core trainers and core staff, including qualifications of any new Core Staff.

(iii) Copies of any explanatory or promotional material used, e.g. Course leaflet, student course outlines, brochures, etc..

(iv) The name of the person who will liaise with the IoA.

(v) Agreement to the terms and conditions of accreditation by the Degree Awarding Body.

Applications for Renewal of Accreditation will be considered by the IoA. Further information can be sought at any time.

The renewal of accreditation is valid for 5 years.

IoA | Institute of
Analytics

The Global Body for Analytics

The Future is Here.

Central Headquarters
IoA – Institute of Analytics
167-169 Great Portland Street
5th Floor, London, W1W 5PF
United Kingdom

✉ accreditation@ioaglobal.org

🌐 www.ioaglobal.org