



# 2017 IAA EDUCATION GUIDELINES

1. An IAA Education Syllabus and Guidelines were approved by the IAA Council at its meeting in Birmingham, England on 6 June 1998. This version of the Guidelines and an updated Syllabus were approved by Council in October 2017 and replace the 2012 updated documents.
2. As part of the full membership requirements of the IAA, associations must have education requirements which are at least equivalent to the Syllabus (taken in conjunction with these Education Guidelines). The objective is that all students will have completed a compliant education syllabus on becoming full members.

## Framework

3. All associations are asked to ensure that all their fully qualified actuaries are admitted through education processes that meet the Education Syllabus and Guidelines. The IAA through the Education Committee would be pleased to work with associations to help them achieve the IAA Education Syllabus and Guidelines. The Secretariat can arrange contact with the Education Committee.
4. Cross recognition of qualifications is an association decision. Compliance by an association with the IAA Education Syllabus and Guidelines will not by itself achieve cross recognition of qualifications.
5. The criteria for being a full member of an IAA Full Member Association are defined by the association; however, such members who began their studies after the date the association became a Full Member of the IAA must have completed a set of education requirements that satisfy the IAA Education Syllabus and Guidelines. The requirements may be those in force at the time the member started their studies or any later version.

## Mathematical Background

6. The mathematical foundation for anyone entering the actuarial profession is very important, as many topics require a deep knowledge of a number of mathematical techniques. The Appendix to the Syllabus lists an example of the mathematical background expected for those commencing actuarial studies. However, more in-depth mathematical studies are implicit in the requirement to demonstrate an understanding of the models and techniques covered by the Syllabus and may be necessary in structuring an actuarial program.

## Variations in Education and Qualification

7. The IAA Education Syllabus and Guidelines do not prescribe an education process, leaving this to each association. There are many effective actuarial education and qualification programs which vary from organisation to organisation and country to country. Some of the important differences are the following:
  - 7.1 **Education basis** - University courses v. self-study with professional examinations.
  - 7.2 **Education source** - Own system in association or use of the system in another association.
  - 7.3 **Training source** - Own organisation training v. use of other organisation training.
  - 7.4 **Control of educational content and qualification standards** - by the actuarial organisation, by universities or by government.
  - 7.5 **Qualification basis** - Examination scores v. university grades.
  - 7.6 **Mathematics / Business Orientation** - Proportion of education on mathematics v. business topics, e.g. accounting, law, regulation, marketing.
  - 7.7 **Specialisation** - Limited (or no) speciality differentiation v. extensive speciality tracks or separate speciality organizations.
  - 7.8 **Qualification standards** - One qualification standard for all actuaries (set by the actuarial organisation or government) v. separate qualification standards by area of practice.
  - 7.9 **National actuarial structures** - One organisation per country v. multiple organisations per country.
  - 7.10 **Diversity of markets for actuaries** - Relative size of market for life insurance, pension, health care, general insurance and other areas of actuarial practice and service.
  - 7.11 **Geographic scope** - Serve one country, several countries or many countries.
8. Nonetheless, there is a high degree of commonality among the education systems for actuaries, and the IAA Education Syllabus and Guidelines have been developed for use as described in the sections below.

## Criteria for Meeting Guidelines

### Breadth

9. The Syllabus has 9 learning areas. Each learning area contains a number of topics and sub-topics. The following criteria are set to ensure appropriate breadth of coverage:
  - 9.1 All learning areas in the Syllabus must be covered.
  - 9.2 Learning areas/topics/sub-topics do not need to be grouped or packaged in the same manner as in the Syllabus.
  - 9.3 Some learning areas may be required by an association to be taken as pre-study or pre-requisite to actuarial study.
  - 9.4 The learning areas should not be treated as being of equal weight when prescribing a full qualification process.

- 9.5 It is important that students are introduced to all the learning areas in the Syllabus but the application of topics/sub-topics can be covered through a limited number of areas.
- 9.6 Different associations will give more or less weight to the various topics/sub-topics within each learning area based on the needs for actuaries in the markets that each association services.

## **Depth**

10. The following criteria are set to ensure appropriate depth of coverage:
- 10.1 Each learning area should be covered to a depth whereby the student has a good knowledge of the learning area as defined in the Syllabus and an understanding of how the learning area is used in problem solving so that the student is able to solve well- defined problems that actuaries may encounter in their work. This is level 2 on the scale below. Some learning areas may be covered in more depth.
- 10.2 In assessing depth associations should consider a four point scale for the treatment of each learning area: 0 – Not covered at all, 1 – An introduction to the topics/sub-topics so the student has a basic knowledge of the learning area, 2 – The student has a good knowledge of the learning area as defined in the Syllabus and an understanding of how the learning area is used in problem solving so that the student is able to solve well- defined problems that actuaries may encounter in their work, 3 – The student has a deep knowledge of the learning area and is able to solve complex problems using judgement.
- It will be appreciated that there is another point of depth on the scale whereby an experienced practitioner with a specialism in the learning area is able to solve ill-defined complex problems using judgement. However, this depth is unlikely to be achieved at the point when an individual initially qualifies as this is acquired with experience.
- 10.3 In assessing the depth of coverage of any one learning area there may be some averaging across all topics/sub-topics as depth of treatment of different topics/sub-topics within that learning area may vary. An indication of the depth of each sub-topic is set out with reference to the Bloom's Taxonomy (see appendix).
11. As a guide to required depth, in many countries, the IAA Education Syllabus and Guidelines depth would be achieved on a combination of university courses of which at least some will be on courses offered after the first level of university degree.

## **Purposes of IAA Education Syllabus and Guidelines**

12. The IAA believes that this document will:
- 12.1 Assist a new actuarial association in establishing its education system and requirements.
- 12.2 Assist an actuarial association in reviewing its education system and requirements.
- 12.3 Assist an actuarial association in evaluating recognition for the training of members of other organizations.

- 12.4 Assist the IAA in evaluating the education requirements of current or prospective IAA members.
- 12.5 Assist a university in establishing or reviewing its actuarial courses.
13. It is intended that the IAA Education Syllabus and Guidelines will serve to improve the international portability of actuaries, actuarial graduates and actuarial students and to improve the international recognition of the actuarial profession.
14. The IAA Education Syllabus and Guidelines are not intended to prescribe an education process and this decision is left to each individual actuarial association. However, each association must demonstrate that its education requirements for admitting members as fully qualified actuaries satisfy these IAA Education Syllabus and Guidelines in the way defined in the internal regulations.

## Recognition by Associations of Other Associations' Education System

15. Some associations may choose to use the education system of one or more associations whose education requirements satisfy the IAA Education Syllabus and Guidelines.
16. The IAA Education Syllabus and Guidelines may be used to assist associations in decision making on cross recognition of qualifications.
17. The IAA Education Syllabus and Guidelines do not address the qualification standard appropriate to practice in particular specialty areas of locations.

## Important Considerations

18. The Guidelines do not prescribe either delivery or assessment methods.
19. The structure of an education system (whether involving universities, other educational institutions or professional examinations) need not follow the order shown in the Syllabus. Learning areas may be arranged and material from various topics/sub-topics within each learning area may be combined in examinations or courses as appropriate.
20. Personal and Actuarial Professional Practice is one of the learning areas in the Syllabus and it is important that associations consider their treatment of this even if for most of the education process they use the system of another association or a university. Associations need to develop a solution that is not theoretical but practical and which has regard to local needs and conditions.
21. Because of the wide variety of situations from jurisdiction to jurisdiction, the IAA Education Syllabus and Guidelines do not address the extent of additional education that might be required to change practice from one jurisdiction to another or from one practice area to another within a jurisdiction.

## Bloom's Taxonomy Appendix

The IAA Education Syllabus illustrates the depth of knowledge and application by using the Model of Learning Objectives created by Rex Heer, Iowa State University. This Model is based on Bloom's Taxonomy of Education Objectives (1956) and Anderson and Krathwohl's 2001 revision.

The Model of Learning Objectives uses both a knowledge dimension and a cognitive process dimension as demonstrated in the graphic below.

### Revised Bloom's Taxonomy (RBT) Cognitive Process Dimension

Verbs →	1. REMEMBER Recognize, Recall	2. UNDERSTAND Interpret, Exemplify, Classify, Summarize, Infer, Compare, Explain	3. APPLY Execute, Implement	4. ANALYZE Differentiate, Organize, Attribute	5. EVALUATE Check, Critique	6. CREATE Generate, Plan, Produce
↓ Objects						
A. Factual Knowledge	A1	A2	A3	A4	A5	A6
B. Conceptual Knowledge	B1	B2	B3	B4	B5	B6
C. Procedural Knowledge	C1	C2	C3	C4	C5	C6
D. Metacognitive Knowledge	D1	D2	D3	D4	D5	D6

Adopting this Model of Learning Objectives accommodates defining both the areas of learning achievement expected of future actuaries and also the specific level and type of knowledge suggested. This framework is widely used and provides Full Member Associations a way of linking the learning objectives with appropriate learning activities and assessments.

The model uses four types of knowledge – Factual, Conceptual, Procedural and Metacognitive – and six cognitive processes – Remember, Understand, Apply, Analyze, Evaluate and Create.

1. Factual knowledge generally involves terminology associated with actuarial work and specific details with respect to financial security systems, actuarial models, actuarial methods and the external forces important to actuarial work. Factual knowledge also includes specific details with respect to membership in the actuarial profession.

2. Conceptual knowledge generally involves the interrelationships among current or potential future financial security systems, common actuarial models, common actuarial methods, external forces and the actuary.
3. Procedural knowledge involves how an actuary actually does something. To demonstrate Procedural Knowledge often requires both Factual and Conceptual knowledge. Many practical skills require Procedural knowledge.
4. Metacognitive knowledge involves an actuary's awareness of his/her strengths and weaknesses, including when the actuary is not qualified to do specific work. This knowledge will also include an actuary's awareness of personal learning needs and lifetime learning strategy. Some normative skills involve acquiring metacognitive knowledge (e.g. self- knowledge).

The six categories of the cognitive process include nineteen specific cognitive processes that clarify the scope of the six categories. There is a natural order for cognitive processes from the lowest order thinking skills "Remember", through "Understand", "Apply", "Analyze" and "Evaluate" to the highest cognitive order "Create". The order does not mean to imply difficulty in succeeding at the cognitive level but rather that the lower cognitive process will be subsumed by another higher cognitive process. For example, you would often need to "Remember" to "Create".

A suggested Bloom's Taxonomy category is included in the Syllabus for each sub-topic as an indication of the depth recommended. This is not meant to be prescriptive, but is intended to assist in setting out a guideline for the depth of knowledge and skill needed for an actuary.