

# IoC Degree Standards

## Bachelor's degree with honours

Graduates should:

- have demonstrated the **responsibility characteristics** (*Autonomy, Influence, Complexity, Knowledge, Business Skills*) for SFIA level 3;
- have demonstrated **proficiency or competency** in one or more relevant SFIA **skills** at level 3 (the *p/c* skill(s));
- have **demonstrated knowledge** for a total of **four** SFIA **skills** at levels 3 or 4, including the *p/c* skill(s), and with at least one at SFIA level 4;
- understand and apply the legal, social, ethical and professional principles that are relevant to their chosen skills;
- demonstrate an understanding of the need for sustainable computing in the context of their chosen skills.

## Master's degree

Graduates should:

- have demonstrated the **responsibility characteristics** (*Autonomy, Influence, Complexity, Knowledge, Business Skills*) for SFIA level 4;
- have demonstrated **proficiency or competency** in **at least one** relevant SFIA **skills** at level 4 (the *p/c* skill(s));
- have **demonstrated knowledge** for a total of **three** SFIA **skills** at levels 4 or 5, including the *p/c* skills, and with at least one at SFIA level 5;
- understand and apply the legal, social, ethical and professional principles that are relevant to their chosen skills;
- demonstrate an understanding of the need for sustainable computing in the context of their chosen skills.

## Notes

- **Knowledge:** The graduate has demonstrated that they can explain and discuss the knowledge relevant to a SFIA skill description.
- **Proficiency:** the graduate has applied relevant knowledge to demonstrate in a realistic <sup>1</sup> environment that they can perform most of the activities defined in a SFIA skill description.
- **Competency:** The graduate has demonstrated, in a working environment, that they have consistently and reliably achieved the expected outcomes for a SFIA skill description at a professional level.

The minimum level of achievement required – **proficiency** – must be demonstrated by repeated successful application of the components of the relevant skill, in a real-world (or realistic simulated) context, over a period of time. This corresponds at least to conscious competence, to *skill* in the terminology of the SFIA professional assessment scheme, and to demonstration of a set of *skills* in **ISO 24773:2019-1** terms.

Note that these standards make no assumptions about the format of delivery of a degree – so, for example, the standards apply equally to university-based degrees, degree apprenticeships and degrees incorporating an industrial placement.

Furthermore, the standards are threshold requirements: good or excellent students from IoC programmes may exceed the relevant standard, and this should be reflected in the classification of their degree.

## Explanatory Notes

The demonstration of competence in a SFIA skill requires that students have completed relevant tasks more than just once or twice in a working environment. They should have had repeated experience of those tasks in varying contexts, so that they can repeat them independently in a working environment.

In order to achieve competence in any SFIA skill, graduates must also have demonstrated the responsibility characteristics for the corresponding SFIA level.

Demonstrating these characteristics will probably require evidence from completing a number of independent projects within the scope of the chosen SFIA skill together with evidence of the generic characteristics of *Autonomy, Influence, Complexity, Knowledge* and *Business Skills*, as described by SFIA.

Since the underpinning knowledge required for at least one skill at SFIA Level 4/5 may be for the same SFIA skill as a *p/c* skill, the requirement for underpinning knowledge is for sufficient skills to bring the total number of SFIA skills demonstrated – either by underpinning knowledge or through competence – to the number required for the specific standard – that is, a total of four skills for a Bachelor's degree and three for a Master's.

Some SFIA skills are not defined for the lower levels (2, 3, 4). If such a skill would be appropriate for a particular programme, the IoC may approach SFIA to extend the skill definition to include the required level. In the meantime, the IoC Accreditation Panel may accept a draft description of the skill at the required level. The computing profession is subject to a range of legal and ethical requirements which may be specific to particular skill areas – such as accessibility law – or may be more generic – such as the provisions of GDPR. Graduates should be fully aware of the legal and ethical requirements that will affect them, as well as the social and professional responsibilities that arise in their work. It is likely that sufficient detail of legal and ethical requirements will have been taught alongside technical material for graduates to have a sound understanding of how these requirements affect their activities.

In addition to these explicit requirements, it is likely that any graduate achieving the standard will have additional underpinning knowledge, and possibly competence, corresponding to several additional SFIA skills at Levels 1, 2 or (for Master's degrees) 3.

## Instantiation

The separation of the standard from the specific curricula (in parallel workstreams 1.2, 1.3 and themes 2/3) mean that the standard itself must be flexible and adaptable. The standard is phrased in terms of demonstration of competence corresponding to responsibility levels in the SFIA framework, but does not mandate any particular skills. Since the responsibility characteristics in

SFIA are common across all skills, and the tasks specified at a particular level for different skills are broadly comparable in difficulty, this abstraction approach allows the specification of a standard that is independent of the particular subject focus – just as the FHEQ, QAA SBS and BCS accreditation requirements are independent of any particular focus. This generic standard can then be instantiated for a number of distinct subject areas, determined by the SFIA skills selected.

## Recognition of achievement

It is proposed that the achievement of "competence" and (underpinning) "knowledge" for particular SFIA skills at the required levels will be recognised by the award of IoC/SFIA badges. Smaller, micro-accreditation badges may also be offered for micro-modules within the flexible modular framework (theme 3), which could be combined to achieve a single IoC/SFIA "knowledge" badge.

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1. Whilst proficiency must be demonstrated in a working context, a workplace supervisor may make a case to justify the use of a professional simulated environment for specific safety-critical tasks.