MSc by Research in Digital Health and Care Innovation

This is an outline proposal for an MSc by Research programme associated with the Digital Health Institute. As part of the DHI funding we have been allocated 15 funded places per year over the next four years for home/EU students. Our goal in this proposal is to provide a flexible framework for an experience-based Masters that will allow DHI partners (companies, HEIs and public bodies) to cooperate in training for the DHI. The structure is aimed at meeting the demand for people who can work in an interdisciplinary team and whose needs are best met by a highly personalised programme design. The proposal is novel, innovative and fit for purpose. Our goal is course so we can begin to promote this course for a 2014 intake.

Course Title: MSc by Research in Digital Health and Care Innovation

Skills Demands

The course is designed to meet skills demands in the area of Digital Health and Care. It is primarily directed to expose specialists and experienced practitioners in one of the four key skills domains of the Digital Health Institute to the other core disciplines and in approaches to Innovation in Digital Health and Care via teams embodying skills from Health and Care, Design, Informatics and Business Schools. The goal is to develop so called “T-shaped” people who have a good grasp of the Digital Health and Care domain while allowing them to gain skills from other disciplines, deepening their own skill set and experiencing working together on Digital Health and Care Innovation in multi-disciplinary teams. Such people are in strong demand ahead of the major re-design of health and social care delivery in Scotland and by SMEs aiming to supply into the growing Digital Health and Care market as well as large-scale companies who are targeting this rapidly growing market. Thus we are aiming not at producing specialists but rather enabling people to deepen their specialism while understanding how to contextualize it in the Digital Health and Care market. Such a course will be in strong demand both by new graduates and experienced practitioners and graduates will be in demand both from public sector bodies and large and small companies.

Student Numbers

Our proposed course will be closely linked to the activities of the Digital Health Institute and will involve students becoming engaged in DHI activities so numbers are closely linked to the capacity of DHI to support them. DHI capacity is based on the number of Experience Labs. This is set at 2 initially; we believe there is capacity to grow this as the DHI develops. In the first five years of the DHI our goal is to see 10 students commence in 2014, then to see 15 each year from 2015-2017. We envisage that over half of these students will be part-time, taking 2-3 years to complete. Overall this totals to 55 students in four cohorts. This is a small number of people but they will have high impact because many of them will be working directly on the reshaping of health and care in Scotland in the Public and Private sectors.

To expand beyond this number of students would require significant further investment in the creation of Experience Labs within the DHI. Our plans for the DHI envisage a significant expansion beyond the two SFC-funded Experience Labs. If this expansion takes place then we will plan an expansion in student numbers and will approach companies to sponsor students on the programme.

Course Design

Our goal is to create a new course specifically designed to enable the four disciplines to work together and to be adaptive to students with significantly different training backgrounds and levels of experience. The proposed outline below may be further refined in response to feedback from DHI partner companies, public bodies and HEIs. The course design is novel and has learning and assessment structures that are carefully fitted to the needs of students in this field. The course will be given as an MSc by Research in Edinburgh but we expect to develop an MDs available at Glasgow School of Art since different populations have different preferences for degree title depending on their disciplinary background.

Course Design Outline

Based on a learning contract approach and using portfolio assessment, the MSc will foster independent learning in research, development, implementation and innovation skills. These are best assessed by a rigorous portfolio approach. The one-year MSc programme diagram appears below. We also envisage that the course could be taken part-time over two or three years. The course outlines are:

Orientation and Planning (10 points): The output of the course is an individual learning contract for the whole period of the MSc. This 10-point course will be assessed 100% by coursework to create "learning
contracts” for the Structured Project Work course. This course is structured into three cycles of work in the DHI Experience Labs. For each cycle the contract will include: learning outcomes, a training plan that identifies training needs and list of deliverables making up the portfolio for that cycle. This will be assessed and given a grade against criteria for the quality of the training plan. The plans will be subject to revision through the study period but the assessment will be made on the plans as developed on the course. This planning stage will usually involve the student’s employer or companies with whom the student is likely to work over the study period.

**Structured Project Work** (90 points): The students will undertake three work cycles in this course. Each cycle will have a different focus. The first will contextualise the work providing a strong understanding of health and social care delivery; the second will enable specialisation and the third the development of a dissertation proposal. Each cycle will involve contributing to a live DHI Experience Lab project that will be working on Innovation in Digital Health and Care. These projects are interdisciplinary innovation projects working on issues arising from real working contexts. Working with tutors, each student will develop a portfolio that captures: their learning gained by accessing course materials (drawn from a portfolio of around 100 advanced Masters courses available across the partners); how they have used that learning in the project together with a reflection on their work in the project. The Structured Project Work course output comprises the portfolio plus evidence of contribution to the project, code, papers, evaluation. etc. The portfolio will have individual assessment for each work cycle. The precise list of deliverables will depend on the projects and the student’s contribution. Assessment is on the quality of the portfolio, its match to the learning contract for the Lab, and contribution to the project.

During the study period it may be necessary to revise the learning contract to take account of changes in the students’ interests. Significant changes will require the authorisation of the course director. Finally the student will complete an 80-point project assessed by dissertation. This will often be linked to an Experience Lab but in any case will engage with public sector Health and Care providers or companies or both.

The deliverables for the students over the year will be:

(i) Their learning contract for the year with details of expected outcomes and objectives; (ii) a portfolio of achievement with assessment feedback; (iii) output from the experience lab projects the student has contributed to; and (iv) A dissertation linked to practice.

Our goal is to provide students with direct experience of the problem space and to expose them to multidisciplinary, agile, team working with an emphasis on identifying the innovation potential of an idea. Almost all components of the course will have company involvement and there will be alignment between the needs of the companies and the needs of the students on course because they will be working on joint projects.

Our goal is to have 100% of final projects carried out on a placement basis.

**Format of the Course**

The design of the course is intended to allow maximum flexibility and we envisage over 50% of students will be undertaking the course part-time. We have also designed to course so that students employed by DHI partner companies could gain credit for learning undertaken as part of a DHI experience lab project undertaken with the company.

**Widening Access**

Our experience of widening access in the more technical aspects of this MSc course is that students who have been working for some time find it hard to adapt to conventional teaching approaches involving coursework and timed examinations. Many students with substantial work experience quickly abandon technical courses when they experience our assessment methods. We do not believe that our traditional teaching, learning and assessment approaches are appropriate for the objectives of the MSc so we have designed a portfolio-based approach that enables students to incorporate learning into practice. We believe this will enable students with significant work experience to acquire new skills even in the more technical domains covered by the course.

**Proportion of Home Students on Course**

Because numbers are quite small and we are aiming for a significant part-time population we will give preference to students who already have links to organizations with links to the DHI. In particular we will aim to prioritize NHS and Social Work employee participation and those in Scottish SMEs. We expect to see around 75% of the cohort resident in Scotland. Beyond that we anticipate recruiting highly talented EU students since we have a high profile in Europe. Such students are highly likely to remain in Scotland provided they are offered employment and will contribute to a necessary inward immigration of highly talented innovators.
### Typical Lab Week

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Mon</td>
<td>am</td>
<td>Lectures/Normal input</td>
</tr>
<tr>
<td></td>
<td>pm</td>
<td>Self-directed work on project</td>
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<tr>
<td>Tue</td>
<td>am</td>
<td>Study work with tutor</td>
</tr>
<tr>
<td></td>
<td>pm</td>
<td>Studio work with tutor</td>
</tr>
<tr>
<td>Wed</td>
<td>am</td>
<td>Self-directed work on project</td>
</tr>
<tr>
<td></td>
<td>pm</td>
<td>Free Time</td>
</tr>
<tr>
<td>Thu</td>
<td>am</td>
<td>Study work with tutor</td>
</tr>
<tr>
<td></td>
<td>pm</td>
<td>Studio work with tutor</td>
</tr>
<tr>
<td>Fri</td>
<td>am</td>
<td>Self-directed work on project</td>
</tr>
<tr>
<td></td>
<td>pm</td>
<td>Self-directed work on project</td>
</tr>
</tbody>
</table>

### Students do three Experience Lab cycles as part of the Structured Project work course

- **Contemplating:** Emphasis on breadth and understanding the use and context of digital health and care
- **Focussing:** Focussing on a particular area of digital health and gaining relevant knowledge
- **Proposing:** Further focussed work on developing a dissertation proposal in the student’s chosen area
MSc by Research in Digital Health and Care Innovation

<table>
<thead>
<tr>
<th>Degree Programme Table:</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Orientation and Planning</td>
<td>10</td>
</tr>
<tr>
<td>Structured Project Work</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>Dissertation (project based – analogous to INFR11043)</td>
<td>80</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>180</strong></td>
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</table>
Informatics Board of Studies - Course Proposal
Proposed course title: Masters by Research: Orientation and Planning
Proposer(s): Stuart Anderson
Date: 17 Nov 2013

1. Case for Support
This is a planning course for Masters by Research programmes whose that include a substantial component of structured project work to achieve specified learning objectives prior to undertaking a large dissertation. The course, taken over three weeks full-time is designed to allow students to orient towards the aims of the Masters by Research and plan their use of structured project time on the Masters. Students will outline and area of interest, select learning they need to achieve in order to complete a successful project in the area, and design a learning plan that will form the basis of their engagement in the structured project portion of the course. The learning plan will be structured into three main sections: Contextualising, Focussing and Proposing. For each section the student will select a coherent and balanced collection of learning outcomes from existing courses and the outline of a portfolio of achievement that will enable to student to demonstrate they have achieved the required learning outcomes as part of the structured project work undertaken in the Masters by Research Programme.

1a. Overall contribution to teaching portfolio
This course is motivated by the structure of our new Masters by Research in Digital Health and Care Innovation. However, it could certainly be taken by any student undertaking Masters by Research study who wishes to plan portfolio based assessment of structured project work prior to completing a Masters by Research dissertation. This course is oriented towards Masters by Research programmes that draw their technical material from the existing portfolio of courses in Informatics. This course is directed at helping students decide on a balanced collection of learning outcomes they can achieve during their structured project work on their Masters by Research. Assessment of the achievement of the learning outcomes will be on the basis of a portfolio of project work with a section that links the work to the specified learning outcomes.

1b. Target audience and expected demand
The target audience is the students taking Masters by Research programmes that comprise this course plus 50-90 points of structured project work as a preparation for a Dissertation project that comprises at least 80 points of the programme. Currently the SFC has funded 15 places per year on a Masters by Research programme in Digital Health and Care Innovation for the next four years. Although this programme has stimulated the proposal for this course we believe it may be of more general utility.

1c. Relation to existing curriculum
This course is compulsory for students undertaking the DHCI Masters by Research. However it could form part of any course whose delivery mode is primarily structured project work as a preparation for a Masters by Research Dissertation.

1d. Resources
The course is intended to run full time over three weeks. In that time students will have 2-3 lectures per week to introduce the concepts of learning outcomes, portfolio assessment, and learning contracts. In addition students will be introduced to the activity in their proposed area of work. Students will also have 4 hours per week of tutorial time to work on their proposed learning outcomes and learning contract.
2. Course descriptor

Course Title: Masters by Research: Orientation and Planning

SCQF Credit Points: 10

SCQF Credit Level: 11

Normal Year Taken: MSc by Research

Also available in years: N/A

Subject Area and Specialism Classification: Computer Science, Artificial Intelligence, Software Engineering and Cognitive Science. As part of any Masters by Research programme with structured project work as a significant component.

Appropriate/Important for the Following Degree Programmes: Masters by Research in Digital Health and Care Innovation.

Timetabling Information: The course should run full time for three weeks at the start of the students’ study period.

School Acronym: INF-??-???

Short Course Description: This course is intended for students taking a Masters by Research programme with a significant component of structured project work prior to the MSc dissertation. The course is directed to creating a learning contract for portfolio-based assessment of the period of structured project work. It allows the student to reflect on and plan their period of structured project work. Students will learn about learning outcomes, portfolio-based assessment and learning contracts as well as developing a plan for their period of structured project work. There will be 8 lectures on various aspects of the course combined with tutorial sessions directed to creating a well-balanced learning contract based on using materials from other Masters-level taught courses as the basis for the learning contract.

Pre-Requisite Courses: None.

Co-Requisite Courses: None.

Prohibited Combinations: None.

Other Requirements: Students should have been accepted onto a Masters by Research programme.

Available to Visiting Students: No, because we do not accept visiting students on our Masters by Research programmes.

Summary of Intended Learning Outcomes:
A. Knowledge and understanding
On successful completion of the course students will be able to:

- Demonstrate knowledge of the notion of learning outcomes by being able to discriminate between well- and poorly-constructed learning outcomes.
- Demonstrate knowledge of what constitutes a coherent and balanced collection of learning outcomes by being able to discriminate between well-balanced and poorly-balanced collections.
- Demonstrate understanding of portfolio-based assessment by being able to discriminate between portfolio specifications that match a collection of learning outcomes and those that do not.

B. Intellectual skills
On successful completion of the course, students will be able to:

- Demonstrate the ability to select a coherent and well-balanced collection of learning outcomes from a large collection of learning outcomes. This should be done by building a set of learning outcomes directed towards a particular learning need the student has identified.
- Demonstrate the ability to develop appropriate portfolio-based assessment to demonstrate the achievement of a collection of learning outcomes by constructing such a portfolio specification for their collection of learning outcomes.
- Demonstrate the ability to construct a learning contract that will ensure their identified learning needs are met provided they fulfill the contract by developing such a contract for their learning needs.

C. Professional/subject specific/practical skills
On successful completion of the course students will be able to:

- This course is aimed primarily at developing a transferrable skill.

D. Transferable skills
On successful completion of the course students will be able to:

- Critically reflect on his/her learning needs and devise a plan to meet those needs.
- Design of appropriate assessment to provide evidence of accomplishment.

Assessment Information
The goal of the course is to create a learning contract for the structured project work to be undertaken as part of an MSc by Research project. Thus assessment is entirely by one assessed assignment that is the learning contract for the subsequent structured project work.
The assessment is on a pass/fail basis coupled to structured feedback on the proposed contract.

**Assessment Weightings:**

- Written Examination: 0%
- Assessed Assignments: 100%
- Oral Presentations: 0%

**Academic description:**
This is a generic course designed to introduce students to the learning contract approach and construct a learning contract to help structure their study in a course of structured project work undertaken before the MSc by Research Dissertation.

**Syllabus:**
1. An introduction to the field of study for the Masters by Research.
2. The design of learning outcomes.
3. Combining learning outcomes to construct a well-balanced collection of outcomes.
6. Constructing a learning contract.

**Relevant QAA Computing Curriculum Sections:** N/A

**Transferrable skills:** See above.

**Reading List:**

**Study Abroad:** N/A

**Study Pattern:** 3 lecture hours and 4 tutorial hours each week, over a period of three weeks with one coursework assignment.

- Lectures: 9 hours
- Tutorials: 12 hours
- Timetabled Laboratories: 0
- Coursework Assessed for Credit: 40 hours
- Other Coursework / Private Study: 39 hours
- Total: 100

**Keywords:** learning contract; learning outcomes, portfolio-based assessment.

**3. Course materials**

3a. **Sample exam question(s)** There are no examinations for this course.
3b. Sample coursework specification: The coursework will be to create a learning contract for the structured project work to be undertaken as a preparation for the MSc by Research Dissertation. The assessment of this work will be on the basis of the quality of the proposed collection of learning outcomes together with the proposed portfolio assessment.

3c. Sample tutorial/lab sheet questions
Tutorial sessions will explore how to select learning outcomes and appropriate methods of assessment of particular learning outcomes. What constitutes a well-balance programme of learning outcomes and how to combine individual assessment components into a portfolio for the collection of learning outcomes in the learning contract.

3d. Any other relevant materials
N/A

4. Course management
4a. Course information and publicity
We will prepare a short video introduction to the course and will prepare materials explaining the process of the course and its intended outcome to be included in any programme that makes use of this approach.

4b. Feedback
Formative feedback will be provided throughout the course at the tutorials. The goal is, over the three week period of the course, to agree a learning contract with the student. The course will be assessed on a pass/fail basis.

4c. Management of teaching delivery
The aim is to create a small cohort of tutors who will help support students throughout the MSc by Research programme. A key element of the programme is the construction of the learning contract and a small group of tutors will be trained in developing such contracts and in ensuring students can meet the contract during their structure programme of project work.

5. Comments
This proposal has been considered at BoS and has had the support of the BoS as part of a programme that is intermediate between a taught Masters and a Masters of Research undertaken entirely by dissertation.

5a. Year Organiser Comments

5b. Degree Programme Co-Ordinators

5c. BoS Academic Secretary
Informatics Board of Studies - Course Proposal

Proposed course title: MSc by Research: Structured Project Work

Proposer(s): Stuart Anderson
Date: 17 Nov 1013

1. Case for Support
The aim of this course is to provide students with a programme of structured project work in preparation for their MSc by Research Dissertation. We assume students undertaking this course will have completed the Orientation and Planning course and will have successfully developed a learning contract for this course. This course is intended to implement the learning contract by supporting students’ learning based on course materials for Informatics Masters courses and in developing a portfolio of work associated with project work that demonstrated the learning outcomes in the learning contract have been achieved. The course should be seen as comprising three components in roughly equal proportion: Contextualising, Focussing, and Proposing. Where students first understand the context of their study, then focus on a particular topic and finally develop a proposal for their MSc by Research Dissertation.

1a. Overall contribution to teaching portfolio
Provides the means to implement a structured approach to the MSc by Research in Informatics. This proposal is generic but it is inspired by the needs of the MSc by Research in Digital Health and Care Innovation in the Digital Health Institute.

1b. Target audience and expected demand
We anticipate between 10 and 20 students per year on this course. The students will be preparing to write an MSc by Research dissertation.

1c. Relation to existing curriculum
At the moment our MSc by Research assumes students will write a 180-point dissertation over a one-year period. This course is part of a programme that aims to structure the MSc by Research to have a more explicitly planned programme of study in preparation for a smaller dissertation.

1d. Resources
We envisage that students will need around 2-3 hours of tutorial support per week to assist with learning material derived from Informatics taught courses and in applying that work as students undertake structured project work. In addition, students should be meeting with their supervisor regularly to discuss the direction of their work. For example, in the MSc by Research in Digital Health and Care Innovation students will be working on projects in the Digital Health Institute Experience Laboratories and will have input from supervisors, tutors, experience lab staff and companies.

2. Course descriptor

Course Title: MSc by Research: Structured Project Work

SCQF Credit Points: 90

SCQF Credit Level: 11

Normal Year Taken: MSc by Research

Also available in years: N/A
Subject Area and Specialism Classification: Computer Science, Artificial Intelligence, Software Engineering and/or Cognitive Science are all appropriate depending on the area of study of the student.

Appropriate/Important for the Following Degree Programmes: MSc by Research in Digital Health and Care Innovation.

Timetabling Information: The course will run over 24 weeks roughly from week 4 of S1 to the end of S2. Since students do not take examinations we anticipate we will use some of the examination block.

School Acronym: INF-??-???

Short Course Description:
This course is essentially a practical course structured around participation in structured project work. In the Orientation and Planning course students will have developed a learning contract that sets target learning outcomes that are necessary in order to participate in the project work together with a description of how evidence of achievement will be derived from the project work. The course is assessed on a pass/fail basis. This assessment will be based on a portfolio of work together with an account of how the work satisfies the proposed learning outcomes.

Pre-Requisite Courses: MSc by Research: Orientation and Planning – this course develops the learning contract this course is intended to implement.

Co-Requisite Courses: None

Prohibited Combinations: None

Other Requirements: Students should be registered on an MSc by Research course.

Available to Visiting Students: No, because MSc by Research courses are not open to visiting students.

Summary of Intended Learning Outcomes:
The detailed learning outcomes for the course will be specified by the learning contract developed in the Orientation and Planning course.

Assessment Information
Assessment will be on the basis of performance in three pieces of coursework intended to illustrate how each of the stages of the structured project work learning contract has been achieved.

Assessment Weightings:

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<th>Component</th>
<th>Weightage</th>
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<tbody>
<tr>
<td>Written Examination</td>
<td>0%</td>
</tr>
<tr>
<td>Assessed Assignments</td>
<td>100%</td>
</tr>
<tr>
<td>Oral Presentations</td>
<td>0%</td>
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</tbody>
</table>
**Academic description:**
This is a structured project course whose learning outcomes are defined in the learning contract developed in the Orientation and Planning course undertaken at the start of the MSc by Research – the contract should be devised to prepare the student to undertake the MSc by Research Dissertation (min 80 points). Normally this will be split into three stages with intermediate portfolio deliverables illustrating the learning outcomes prescribed in the learning contract have been achieved – the stages are usually contextualising, focussing and proposing which allows the student to become familiar with the research area, to focus on a topic and to develop a proposal for the MSc by Research Dissertation.

**Syllabus:** The syllabus is determined by the learning contract developed in the pre-requisite Orientation and Planning course.

**Relevant QAA Computing Curriculum Sections:** Depends on the Learning Contract.

**Transferrable skills:** Research skills including (not all of these will necessarily be included but many will be explicitly required in the learning contract) bibliographic search and review, experimental design, evaluation strategies, research ethics, the mechanics of an ethics application, structuring and developing a long research dissertation, ...

**Reading List:** Determined in the associated Learning Contract.

**Study Abroad:** N/A

**Study Pattern:**
0.5 lecture hours and 2 tutorial hours each week, with 3 coursework assignments.

- Lectures: 12 hours
- Tutorials: 48 hours
- Supervisory hours: 20
- Timetabled Laboratories: 0
- Coursework Assessed for Credit: 420
- Other Coursework / Private Study: 400
- Total: 900

**Keywords:**
[A list of searchable keywords.]

3. Course materials
3a. Sample exam question(s)
There is no examination for this course.

3b. Sample coursework specification
The coursework will be determined by the Learning Contract agreed in the Orientation and Planning course.
3c. Sample tutorial/lab sheet questions
Students will be organised into small tutorial groups and the discussion will be directed by the needs of the project work being undertaken by the students.

3d. Any other relevant materials
N/A

4. Course management
4a. Course information and publicity
The course will be advertised as part of the MSc by Research in Digital Health and Care Innovation.

4b. Feedback
Students will be provided with formative feedback on each assignment as they progress towards the delivery date for the deadline. Each assignment will have roughly 8 weeks of work involved in its preparation. Summative feedback will be on a pass/fail basis. Students must pass the “proposing” assignment and at least one other to pass the course. After submission of each assignment the student will be provided with detailed feedback in order to help shape the next stage of their study.

4c. Management of teaching delivery
Students will have individual allocated supervisors who will meet regularly with the students. Students will also be allocated to a tutorial group and PG tutors will assist them in preparing their coursework. PG tutors will be trained in providing support in the development of research skills and students will be able to access more technical support via specialist tutors in individual Informatics courses.

5. Comments
An early version of this course was considered by the Informatics BoS and met with approval from the meeting.

5a. Year Organiser Comments

5b. Degree Programme Co-Ordinators

5c. BoS Academic Secretary