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Annex 1: Programme Specifications Template with Guidance Notes

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she passes the programme.

More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the programme handbook. The accuracy of the information contained in this specification is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Degree and Programme Title MSc Cancer Biology

1. **Awarding Institution/Body**	University of Kent
2. **Teaching Institution**	University of Kent
3. **Teaching Site**	Canterbury
4. **Programme accredited by**	N/A
5. **Final Award**	MSc/PGDip
6. **Programme**	Cancer Biology
7. **UCAS Code (or other code)**	JACS code C110
8. **Relevant QAA subject benchmarking group(s)**	None
9. **Date of production/revision**	1st December 2010
10. **Applicable cohort(s)**	September 2011

11. **Educational Aims of the Programme**

The programme aims to:

- Provide an excellent quality of postgraduate level education in the field of cancer, its biology and its treatment
- Provide a research-led, inspiring learning environment
- Provide a regional postgraduate progression route for the advanced study of a disease that affects a high proportion of the population
- Promote engagement with biological research into cancer and inspire students to pursue scientific careers inside or outside of the laboratory
- Develop subject specific and transferable skills to maximise employment prospects
- Promote an understanding of the impact of scientific research on society and the role for scientists in a range of professions

12. **Programme Outcomes**

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. There are no relevant benchmarking statements.

Knowledge and Understanding	**Teaching/learning and assessment methods and strategies used to enable outcomes to be achieved and demonstrated**
A. Knowledge and Understanding of:	
1. Principles and application of key techniques in modern molecular bioscience	*Teaching and learning* Lectures, seminars, tutor-led and self-directed learning, case study analysis, practical classes, research project *Assessment* Examinations, practical classes, laboratory reports, continuous assessment, oral and poster presentations, project report
2. Molecular, cellular and physiological basis of cancer	
3. Key contributors to the onset of carcinogenesis	
4. The interaction of genes and environment in the onset of cancer	
5. Current therapeutic strategies and their application in the treatment of different cancers	
6. The basis for targeted treatment of specific cancer types	
7. The processes and procedures by which scientific knowledge is translated to patient care	
8. The way in which scientific knowledge is disseminated to different stakeholders: e.g. media, policy makers, and public	
Skills and Other Attributes **B. Intellectual Skills:**	
1. Research skills: how to formulate research questions and hypotheses to address scientific issues	*Teaching and learning* Lectures, seminars, tutor-led and self-directed learning, case study analysis, experimental planning, practical classes, research project *Assessment*
2. Analytical skills: interpretation of data, marshalling information from published sources, critical evaluation of own research and that of others	
3. Information technology: use of appropriate technology to retrieve, analyse and present scientific	

information	Examinations, practical classes, laboratory reports, continuous assessment, oral and poster presentations, project report
4. Statistical evaluation: the use of appropriate statistical analysis methods in handling scientific data	
C. Subject-specific Skills: *These should include practice and professional skills*	
1. Experimental skills: how to design experiments to address specific research questions and hypotheses	*Teaching and learning* Lectures, seminars, tutor-led and self-directed learning, case study analysis, experimental planning, practical classes, research project *Assessment* Examinations, practical classes, laboratory reports, continuous assessment, oral and poster presentations, project report
2. Practical skills: key techniques in modern molecular biology and their application in molecular bioscience to solve research problems	
3. Data handling: how to record experimental procedures and data appropriately using good laboratory practice	
4. Presentation of scientific research: how to write research articles in an appropriate style in keeping with high impact factor scientific journals, and posters and oral presentation for conferences and symposia	
5. Science writing: how to present scientific information to scientific and non-scientific audiences	
6. Careers: a recognition of career opportunities for scientists outside of the laboratory	
D. Transferable Skills:	
1. Communication: ability to organise information clearly, present information in oral and written form, adapt presentation for different audiences	*Teaching and learning* Lectures, seminars, tutor-led and self-directed learning, case study analysis, experimental planning, practical classes, research project
2. Reflection: make use of constructive informal feedback from staff and peers and assess own progress to enhance performance and personal skills	

3. Self-motivation and independence: time and workload management in order to meet personal targets and imposed deadlines	*Assessment* Examinations, practical classes, laboratory reports, continuous assessment, oral and poster presentations, project report
4. Team work: the ability to work both independently and as part of a research group using peer support, diplomacy and collective responsibility	

13. Programme Structures and Requirements, Levels, Modules, Credits and Awards

The Cancer Biology MSc is a one year (full time), two year (part time) course, comprising 180 credits and 1,800 total study hours. It provides advanced research skills training within the context of a disease which affects 1 in 3 of the UK population and which remains a significant topic of interest for both undergraduates and postgraduates. With the UK being a world leader in cancer research and pharmaceutical development, there are significant opportunities for career progression for graduates of this programme in academia (PhD) and industry, while there are also opportunities for careers outside the laboratory in advocacy, media, public health and education.

The taught component of the programme **(Stage 1)** comprises two discrete term stages. The *Autumn term* will ultimately represent a core PGT training structure in Biosciences upon which we will be building additional PGT programmes in the future. It features a 30-credit module that provides intensive practical and research skills training both within and outside the laboratory, which will address the key modern technologies used in cancer research, their application to solving research problems, and the interpretation of scientific data. This core training term will also feature our existing 30-credit "Science at Work" module, which provides students with insight into the role of science in society, science policy formulation, principles of public engagement with science, and career progression routes outside the laboratory. This transferable scientific training is a distinctive element of our postgraduate provision which has been recognised as good practice within the Bioscience community and by Research Councils. These core principles will be developed in the *Spring term* with a series of M-level modules that will provide a cancer-specific context. These modules will provide students with an understanding of the disease, existing and emerging methods for its treatment, and the challenges of harnessing scientific knowledge in clinical situations. Assessment will be by a combination of coursework and examination. Currently, all modules below are required and there are no options, but as our PGT portfolio builds there will be other modules that could contribute as options (subject to the programme changes being approved through usual QA procedures). Successful completion of Stage 1, as determined by an Examination Board, would lead to a Postgraduate Diploma. The programme will be subject to the University regulations on compensation and condonement.

The research project **(Stage 2)** takes place over the Summer term and Summer vacation period and cannot be compensated or condoned. An Examination Board will determine progression on to Stage 2 early in the Summer term; students will require at least 90 credits in order to progress to the project stage, and will be permitted to resit up to 30 credits during August. The projects will largely be supervised in Biosciences, but there may be opportunities for collaborative provision in industry; these will be investigated on a case-by-case basis. The final Examination Board, at which recommendations will be made for the final award of a degree, will take place in October.

Code	Title	Level	Credits	Term(s)
Year 1				
Required Modules				
BI830	Science@work	M	30	Autumn
BI836	Practical and applied research skills for advanced biologists	M	30	Autumn
BI837	The molecular and cellular	M	15	Spring

	basis of cancer			
BI838	Genomic stability and cancer	M	15	Spring
BI839	Targeted cancer therapies	M	15	Spring
BI840	Translational medicine: from bench to bedside	M	15	Spring
BI845	Research project*	M	60	Summer and vacation

14. Work-Based Learning

Where relevant to the programme of study, provide details of any work-based learning element, inclusive of employer details, delivery, assessment and support for students.

There are no specific work-based learning elements to this programme; however, the research project may offer specific opportunities to work with industrial research collaborative partners (with co-supervision by Kent staff). These opportunities would be investigated and assessed on a case-by-case basis as they would be dependent upon the needs of the industrial partners, but they would not affect the assessment of the programme as they would fit within the existing module pattern.

15. Support for Students and their Learning

- Personal tutorial system
  Each student will have a tutor assigned from the key teaching team
- Woolf College Master
  Issues relating to non-academic student welfare, e.g. accommodation
- Graduate School transferable training programme
  Students will be encouraged to engage with relevant transferable training and social interaction within the Graduate School and its student community
- Biosciences postgraduate induction programme
  Students will participate in this programme (with both PGT and PGR students) in Welcome Week
- Student Handbook
  This will outline module information, programme structure, arrangements for assessment hand in and the pastoral support available
- Biosciences Student Resource Room and Postgraduate/Staff Tea Room
  Both provide computing facilities as well as WiFi access for informal work and social interaction (this is in addition to the space provided by the Graduate School)
- Twice-weekly seminar programme (during academic term time)
  A shared research forum for internal and external speakers providing a vibrant research environment
- Student Learning Advisory Service
  Providing student support on a self-referring or, in some instances, recommended basis
- Postgraduate Personal Development Folder
  Personal development planning resource for all postgraduate students emphasising self directed learning, development of employability skills and

- Research laboratory infrastructure and core facilities
  Students will make use of core research facilities and space during practical training and research projects

16. Entry Profile

Entry Route

This postgraduate qualification will require a minimum entry requirement of a Lower Second Class Honours degree or equivalent in a Biosciences-related programme. Others may be admitted if they have additional vocational experience that is relevant to the programme. Students from overseas for whom English is not the first language will, in addition, be subject to the standard postgraduate entry requirement for English. We are investigating a pre-Masters entry route that will permit students to enter with lower English language requirements but this will not be on stream until the September 2012 entry cycle.

What does this programme have to offer?

- The study of molecular bioscience at an advanced level in the context of a disease that affects 1 in three of the UK population
- A progression route for PhD level study
- Laboratory-based research experience attractive to employers and graduate schools
- Teaching by research active cancer-specialists, including a National Teaching Fellow
- Incorporation of content and discussions on the role of science and scientists in society which encourages students to engage with public affairs, understand the context within which science operates, and open up careers beyond the laboratory
- Excellent research facilities and a vibrant research environment with around 70 postgraduate students
- Insight from NHS practitioners and industrial partners who provide insight into application of cancer-specific knowledge in patient care

Personal Profile

- Students with a degree in Biosciences with a particular and unfulfilled interest in cancer
- Students who wish to undertake a PhD but who lack the research experience to be admitted straight from undergraduate degree level
- Students with Lower Second Class honours degrees who wish to study for a PhD
- Students from Kent who wish to study at M-level for another year to gain an M-level qualification.
- Students who have attended Kent for short-change programmes (e.g. Junior Year Abroad and Biotechnology Summer School) who wish to attend for a full year.

17. Methods for Evaluating and Enhancing the Quality and Standards of Teaching and Learning

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards

- Student evaluations forms
- Annual monitoring procedures, e.g. module and programme reviews
- External examiners' reports and response to those reports
- Periodic programme review
- Standing item for GPT programmes in Graduate Studies Committee
- Peer observation
- External practitioner teachers and advisors from NHS
- Regular teaching team meetings

Committees with responsibility for monitoring and evaluating quality and standards

- Staff/Student Liaison Committee
- School Graduate Studies Committee
- Faculty Graduate Studies Committee
- Indirect advice and monitoring by School learning and teaching committee
- Board of Examiners

Mechanisms for gaining student feedback on the quality of teaching and their learning experience

- Student evaluation forms
- Staff/Student Liaison Committee
- Personal tutorial system

Staff Development priorities include:

- Core teaching team are experts in cancer research
- Training for postgraduate student demonstrators in practical classes
- Staff development courses for use of innovative assessment
- Programme team meetings
- Conferences (these are already part of research roles)

18. Indicators of Quality and Standards

Programme Director is a National Teaching Fellow and Faculty Teaching Prize winner

Key teaching team member is former President of the Federation of European Cancer Societies and the President of the European Association for Cancer Research

Significant research funding awarded to key teaching team

Industrial collaborations emphasise impact of scientific research

Consistently high level of performance in the National Student Survey

External lecturers with translational and clinical expertise from NHS

Delivered in association with the Kent Cancer Trust

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Module mapping

BI830: Science at work (existing module)
BI836: Practical and applied research skills for advanced biologists
BI837: The molecular and cellular basis of cancer
BI838: Genomic stability and cancer
BI839: Targeted therapies for cancer
BI840: Translational medicine: from bench to bedside
BI845: Research project

NB. Module codes are to be confirmed and have been used to facilitate programme and module mapping.

		A								B				C						D			
		1	2	3	4	5	6	7	8	1	2	3	4	1	2	3	4	5	6	1	2	3	4
BI830	30							X	X		X	X						X	X	X	X	X	
BI836	30	X								X	X	X	X	X	X	X	X			X		X	X
BI837	15	X	X	X	X	X					X	X		X	X	X	X			X	X	X	
BI838	15	X	X	X	X		X				X	X	X	X	X	X	X			X	X	X	
BI839	15					X	X		X					X	X	X	X	X	X	X	X	X	
BI840	15							X	X		X	X	X			X	X	X	X	X	X	X	
BI845	60	X								X	X	X	X	X	X	X	X			X		X	X

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Comments on University of Kent MSc Cancer Biology Course

David Phillips, Professor of Environmental Carcinogenesis, Institute of Cancer Research

The curriculum content of this course looks to be well-designed and comprehensive. I can see no significant omissions. The course will appeal to graduates in biological sciences who want more advances training in the speciality of a prominent disease with complex cellular and molecular mechanisms. This is a fast moving area of science, which will necessitate constant updating and flexibility in the course content, but provided this is built in to the course implementation, there should be no problems. The course consists of both general modules and those more specifically related to cancer. While this is acceptable and logical and will introduce students to the subject within the appropriate context, I have raised some "points to consider" on this and other matters below. These are framed as questions, rather than criticisms or concerns. It may well be that the issues I raise have been addressed and satisfactory answers provided, but not included in the necessarily succinct summary of the course content.

The course is composed of 120 taught credits and 60 credits for a research project. This looks ot be a good balance and the students should obtain a thorough training in both theoretical and practical, hands-on, aspects of this important field of science.

Points to consider

1. The taught part of the course consists of 75 credits on general, non-cancer-specific subjects, and 45 credits on cancer. Is this the right balance? In other words, how much of the content of the non-cancer-specific modules actually deals with cancer? If this is substantial, then this will address this issue.

2. The two cancer-specific modules do not start until the second term of the course. Is there something to be said for running one of them from the start of the course? Again, if the other courses have substantial cancer content, this may answer this point.

3. The topics covered in the cancer modules appear to be very comprehensive. With regard to the first one (The molecular and cellular basis of cancer), subjects that I would like to be sure are covered include the clonal origin of tumours (coupled with the paradoxical heterogeneity of tumours), and understanding of mechanisms of metastasis. In the second one (genomic stability of cancer) is the subject of epigenetic changes in tumours covered? In the third (Targeted cancer therapies) will any coverage of radiotherapy be included?

4. The fact that this is a course called Cancer Biology could justify the exclusion of issues of cancer detection, imaging and radiotherapy (but see above: targeted radiotherapy combined with imaging is a novel and promising approach to treatment). It would be helpful to clarify whether this is indeed the intention. On the other hand, the coverage of chemical and biological therapies looks to be very good.

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Response to comments from external assessor, Professor David Phillips, Institute of Cancer Research, Royal Marsden Hospital

We thank Professor Phillips for his thoughtful and supportive comments. We agree with his suggestions for points to consider; some of which were inherent in the existing curriculum content but omitted for succinctness, others are helpful suggestions. We have addressed the specific comments as outlined below:

1. The cancer-specific modules actually represent 60 credits of cancer-specific content – the Translational Medicine module will be cancer-specific. We intend to use this in future PGT developments – using cancer and its treatment and an illustration of translational medicine. This will mean that the whole Spring term focuses on cancer. In addition, the "Practical and applied research skills for advanced biologists" will outline key skills but within a cancer context; for instance, skills in molecular biology will be developed in a mini-project in which students design and produce an anti-cancer antibody, and seminars will focus on research studies within the cancer field that illustrate the key concepts in cancer biology.

2. As described above, cancer-specific content will be introduced early in the Autumn term, providing context for key skills training.

3. Professor Phillips has made good suggestions for content that should be included. We had already incorporated clonal origin, tumour heterogeneity, metastasis and radiotherapy within the curriculum although it is not specifically mentioned in the documents. Epigenetic changes had not been incorporated – this is an excellent suggestion and will be included.

4. The intention has certainly been to align the content of the course with existing research which has tended to be on the "Cancer Biology" side rather than a general course in cancer or oncology, and Professor Phillips has correctly identified that this MSc is taking a more molecular approach. However, we do not intend to ignore issues such as detection; indeed there will be a significant section on imaging in the Translational Medicine module, and as mentioned previously we do intend to cover issues such as radiotherapy.

We are very grateful for Professor Phillips' input into the course content and for his support in the development of the programme.

Dan Lloyd, School of Biosciences