

EXTERNAL EXAMINER ANNUAL REPORT FORM

Guidance notes are available to support the completion of this Report via the Cardiff University Intranet [here](#) and from ExternalExaminers@cardiff.ac.uk .

	For completion by External Examiner:		
Name of External Examiner:	Dr C H Oxley		
Home Institution / Employer of External Examiner:	Independent Academic, was with De Montfort University until Nov 2016.		
Programme and / or Modules Covered by this Report	MSc Wireless Microwave Communication Engineering & MSc Communication Technology & Entrepreneurship		
Academic Year / Period Covered by this Report:	2016 to 2017	Date of Report:	20/06/2017

Please complete all information in the spaces provided and submit within **six weeks** of the Examining Board (the **taught stage** Examining Board in the case of **postgraduate Master's programmes**).

Please note this form will be published online and should not make any reference to any individual students or members of staff in accordance with the Data Protection Act (1998).

Please extend spaces where necessary.

1. Programme Structure (curriculum design, programme structure and level, methods of teaching and learning)

The MSc courses are well balanced the lectures covering the breadth in microwave, wireless and communication. Some of the modules include both theory/design and the more practical aspects in the form of assignments. I believe the courses are unique within the UK as several of the modules for example RF amplifiers, non-linear characterisation, are based on international research expertise at Cardiff. During the four years I was external examiner some students from the MSc Wireless Microwave Communication Engineering course have continued their studies as PhD students in RF power amplifier design.

It was good to see take up of the MSc Communication Technology and Entrepreneurship course by 4 students this year. The MSc course utilises most of the modules from the Wireless Microwave and Communications Engineering MSc; the main difference is the Business School leads the project work, which is group and industrially based. The students I interviewed on the Entrepreneurship MSc course were enjoying the experience, however I felt that project work details had only recently been communicated to them.

2. Academic Standards (comparability with other UK HEIs, achievement of students, any PSRB requirements)

The academic standards are high and comparable with similar courses offered by comparable universities. The examination paper material and assignments were to a high standard with analytical and discussion elements. On the MSc Wireless & Microwave Communication Engineering course 4 of the 8 enrolled students are heading for a distinction depending on their dissertation work.

3. The Assessment Process (enabling achievement of aims and learning outcomes; stretch of assessment; comparability of standards between modules of the same level)

The assessment process was transparent and fair to the student. The scripts were second marked in green pen. The 9 MSc students I interviewed were all complementary on feedback, which was informative and within the required two-week period.

The rubrics were changed this year from answering three questions out of four to answering all four questions. It was apparent on 2 modules ENT713 & ENT818 the students struggled to complete the 4 questions. For these two modules the results were moderated by selecting three questions with the highest marks. In my opinion, the moderation was fair and favourable to the students. I did note that at least one other module ENT706 students appeared to struggle with question 2, which may have been for similar reasons. The balance of the content of the question is difficult and particularly for the more descriptive questions but hopefully will be improved on for next academic year.

One small observation from the scripts I looked through was majority of students answered the questions in chronological order, rather than adopting an exam technique (answering the questions you able to do well in first). This may be as the cohort of students were all international (high percentage of Chinese).

I certainly in particular liked the format of the assignment mark sheet for ENT799 which was very clear and useful for student feedback, which could be the basis for a general mark/feedback proforma for all assignments.

The 4 students reading MSc Communication Technology and Entrepreneurship were concerned about group project marking, as a weak student would lower the marks of the rest of the group.

4. Year-on-Year Comments

[Previous External Examiner Reports are available from the Cardiff University Website [here](#).

- 1) I would like to congratulate the course team as the small number of students seen in the previous two years has been substantially increased to 8 students enrolled on MSc Wireless & Communication Engineering and 4 students on MSc Communication Technology and Entrepreneurship.
- 2) My last year's observation on feedback to external examiner regarding his/her comments on exam papers has been addressed.
- 3) I interviewed 9 students from the two MSc courses this year. They were very complementary about the course particularly citing modules relating to RF design and non-linear analysis. They asked if consideration could be given to introducing some assignments, to help to improve understanding, in the following modules Advanced Communication (ENT706), Opto-Electronics (ENT795) and Fundamentals of micro & nano electronics (ENT713), which

are all presently 100% exam modules. A number of students asked if more practical work could be introduced particularly RF design and build.

5. Preparation for the role of External Examiner (for new External Examiners only) (appropriateness of briefing provided, visits to School, programme handbooks and supporting information)

N/A

6. Noteworthy Practice and Enhancement (good and innovative practice in learning, teaching and assessment; opportunities for enhancement of learning opportunities)

- 1) The paperwork pack for the exam board meeting was useful and I certainly would like to encourage its implementation. Not sure it is useful to have copies of programme regulations included in each pack.
- 2) I understand other forms of MSc courses in this subject area are being considered. I would strongly like to encourage these particularly if they help to enhance student participation and learning in this very important area of Microwave/RF and Wireless Communication to the UK.
- 3) It was good see more assignment assessment forms, and a standard assignment assessment proforma will help to move to a more paperless system.

7. Appointment Overview (for retiring External Examiners only) (significant changes in standards, programme/discipline developments, implementation of recommendations, further areas of work)

Thank you for inviting me as your external examiner for your MSc courses Wireless Microwave Communication Engineering and Communication Technology and Entrepreneurship. It has been a pleasure working with the course team and seeing the student numbers improve this year, over the low numbers in the previous two years. I have been impressed by the dedication of the course team enthusiastically delivering a world leading MSc even when student numbers were low. The exam paper questions have remained a high standard throughout my time as external examiner and issues raised for example the content of the research study module have been addressed. Second marking is now consistently carried out to appropriate regulations. Sufficient time is made available for both student interviews, which provide a good insight into the course, and for looking through the exam scripts. Throughout my time as external examiner I have been impressed with your students who are enthusiastic and constructive with their feedback. May I take this opportunity to wish you success in the coming years with further increases in student numbers.

8. Annual Report Checklist

Please include appropriate comments within Sections 1-7 above for any answer of 'No'.

		Yes (Y)	No (N)	N/A (N/A)
Programme/Course Information				
8.1	Did you receive sufficient information about the Programme and its contents, learning outcomes and assessments?	Y		
8.2	Were you asked to comment on any changes to the assessment of the Programme?	N/A		
Draft Examination Question Papers				
8.3	Were you asked to approve all examination papers contributing to the final award?	Y		
8.4	Were the nature, spread and level of the questions appropriate?	Y		
8.5	Were suitable arrangements made to consider your comments?	Y		
Marking Examination Scripts				
8.6	Did you receive a sufficient number of scripts to be able to assess whether the internal marking and classifications were appropriate and consistent?	Y		
8.7	Was the general standard and consistency of marking appropriate?	Y		
8.8	Were the scripts marked in such a way as to enable you to see the reasons for the award of given marks?	Y		
8.9	Were you satisfied with the standard and consistency of marking applied by the internal examiners?	Y		
8.10	In your judgement, did you have the opportunity to examine a sufficient cross-section of candidates' work contributing to the final assessment?	Y		
Coursework and Practical Assessments				
8.11	Was the choice of subjects for coursework and / or practical assessments appropriate?	Y		
8.12	Were you afforded access to an appropriate sample of coursework and / or practical assessments?	Y		
8.13	Was the method and general standard of assessment appropriate?	Y		
8.14	Is sufficient feedback provided to students on their assessed work?	Y		
Clinical Examinations (if applicable)				
8.15	Were satisfactory arrangements made for the conduct of clinical assessments?			
Sampling of Work				
8.16	Were you afforded sufficient time to consider samples of assessed work?			N/A
Examining Board Meeting				
8.17	Were you able to attend the Examining Board meeting?			
8.18	Was the Examining Board conducted properly, in accordance with established procedures and to your satisfaction?	Y		
8.19	Cardiff University recognises the productive contribution of External Examiners to the assessment process and, in particular, to the work of the Examining Board. Have you had adequate	Y		

	opportunities to discuss the Programme and any outstanding concerns with the Examining Board or its officers?			
Joint Examining Board Meeting (if applicable)				
8.20	Did you attend a Composite Examining Board, i.e. one convened to consider the award of Joint Honours degrees?			N/A
8.21	If so, were you made aware of the procedures and conventions for the award of Joint Honours degrees?			N/A
8.22	Was the Composite Examining Board conducted according to its rules?			N/A
Examination of Master's Dissertations (if applicable)				
8.23	Did you receive a sufficient number of Dissertations to be able to assess whether the internal marking and classifications were appropriate and consistent?		N*	
8.24	Was the sample in accordance with the University's sampling guidelines (guidelines provided below)?	Y		
8.25	Were you satisfied with the standard and consistency of marking applied by the Internal Examiners?	Y		
8.26	Were you able to attend the Master's Degree (Dissertation) Stage Examining Board?		N	
8.27	If so, was the Examining Board conducted properly and in accordance with established procedures?			N/A
8.28	Were the schemes for marking and classification correctly applied?			
8.29	Were the standards of the awards recommended appropriate?	Y		
8.30	<p>Comments on the Examination of Master's Dissertations. <i>Please provide any comments you may wish to make on the issues raised above.</i></p> <ul style="list-style-type: none"> Last year only one student on the course, received one dissertation which was of a high standard. 			

Please return this Report, **in a Microsoft Word format**, by email to:

externalexaminers@cardiff.ac.uk

Your fee and expenses claim form and receipts, should be sent electronically to the above email address or in hard copy to:

External Examiners, Registry, Cardiff University, McKenzie House, 30-36 Newport Road, Cardiff, CF24 0DE

**EXTERNAL EXAMINER REPORT FORM
MASTER'S DEGREE (DISSERTATION) STAGE**



This Report Form supplements the External Examiner Report form submitted by the External Examiner in respect of Postgraduate Certificates and Postgraduate Diplomas (i.e. the Taught Stage of the Master's programme). This form and other External Examiner documentation is available electronically at: <http://www.cardiff.ac.uk/regis/ifs/exex/index.html>

SECTION A *To be completed by the School*

School: ENGINEERING
Name of External Examiner: Dr C Oxley
Programme of Study examined: MSc Wireless Microwave Communication Engineering
Academic Year/Session to which the Report applies: 2017-18
Number of Students in the current cohort: 7
Number of Dissertations seen by the External Examiner: 7
Number of Dissertations seen by any Co-External Examiner(s): N/ A

SECTION B *To be completed by the External Examiner*

Please respond to the following questions by ticking the appropriate box. Please make appropriate comments particularly if your answer is 'No' to any question. Wherever possible please submit the form in word-processed format. An electronic version of this form is available at www.cardiff.ac.uk/regis/ifs/exex/index.html

Dissertations for Master's Programmes		Yes	No
1	Did you receive a sufficient number of Dissertations to be able to assess whether the internal marking and classifications were appropriate and consistent?	y	
2	Was the sample in accordance with the University's sampling guidelines (guidelines provided overleaf, summary details on sample in Section A above)?	y	
3	Were you satisfied with the standard and consistency of marking applied by the Internal Examiners?	y	

Freedom of Information Act The University is a public authority and therefore subject to the Freedom of Information Act 2000. The University may therefore be required to publish the whole or parts of any reports and correspondence submitted by its External Examiners. The University also reserves the right to choose to publish the whole or parts of any reports submitted by its External Examiners.

This form and other External Examiner documentation is available electronically at: <http://www.cardiff.ac.uk/regis/ifs/exex/index.html>

4 Comments Please use an additional sheet if required.

I reviewed all seven MSc dissertations, the work gave a good flavour of a high technical standard, which I felt was comparable to other institutes with similar academic standing. I was pleased to note that two of the projects were supported by industry – Plextek and Kongsberg Norspace AS. The topics covered a broad part of the communication spectrum with three out of the seven touching on power amplifier design – a major International/National research area in the School of Engineering at Cardiff University. All the presented theses indicated good student engagement, and the majority were to a high presentation standard, however I felt a couple of the overseas students may have struggled in expressing themselves using the written English language. The awarded marks covered a range from 55 to 80% as I would expect from a cohort of MSc students. I particularly liked the marking scheme matrix but felt it may advantage students who didn't pay attention to the 'detail' of their presentation for example high numbers of typing errors, poor citation, poor abstract, poor figure labelling, poor definition of acronyms etc. I feel it would be helpful if all the students could use the same citation method ie IEEE. I broadly agreed with the marks given by the internal examiners, and have included a few comments on the individual dissertations.

- 1) 'Ultra-linear power amplifiers for wireless over fibre applications', an interesting and extensive piece of work which on the whole was well organised. Good understanding with some novelty. I agree with the final mark.
- 2) 'High efficiency GaN amplifier', an interesting and technically sound piece of work – a pity the amplifier was not built. I felt the thesis may have been hurriedly written as attention was not given to the presentation 'detail' – large number of typo errors including figure label formats, no table giving acronyms, surprisingly no journal citations, SiC on GaN (page 19) and poor abstract. Reference was made to experimental results but with no detail. I feel the marking matrix overlooks these points and therefore it is possible to award a student a similar mark to a student who completes a similar good technical piece of work and taken care over the 'detail' in the presentation.
- 3) 'A 10Watt L-band GaN power amplifier for satellite search and rescue transponders', a very well written dissertation with critical analyses. Design, simulation, build and experimental results. I agree with the final mark.
- 4) 'High efficiency power rectifier the back-to-front power amplifier', Very interesting dissertation an excellent piece of work. I agree with the mark.
- 5) 'Communication system for implantation – worn devices', good lay-out and detail analysis and simulation of Colpitt oscillator. Pity no experimental work. I agree with the final mark.
- 6) 'Control of temperature and power in microwave applications', a lot of description which added little to the work, I found parts of the dissertation difficult to understand and felt that the student hadn't fully grasp the project resulting in the work drifting away from the objectives. Part of the problem may be the overseas student not having sufficient command of technical written English. I was not convinced by the citation method used. I felt the mark may have been a little high when compared to other dissertations from the batch.
- 7) 'Microwave-catalytic wastewater treatment' The student appears to have put a lot of work (for example the literature review) into his dissertation with COMSOL modelling and some experimental results of a microwave resonate cavity. However, I found many areas of the dissertation difficult to understand (may be partly due to poor command of written English) and there appeared to be no clearly stated objectives. I agree with final mark.

