

# The University of Leeds

## EXTERNAL EXAMINER'S REPORT

ACADEMIC YEAR: 2017-18

### Part A: General Information

#### Subject area and awards being examined

*Title and Name of Examiner:*

*Faculty / School of:*

*Subject(s):*

*Programme(s) / Module(s):*

*Awards (e.g. BA/BSc/MSc etc):*

School of Electronic and Electrical Engineering

*Electronic and Electrical Engineering*

Undergraduate and selected MSc level modules in Electronic and Electrical Engineering and related subjects

BEng/MEng

### Part B: Comments for the Institution on the Examination Process and Standards

#### Points of innovation and/or good practice

*Please highlight areas of innovation or good practice within the programmes or processes you have been involved with in this box.*

Good practice:

1. Prompt and clear communication with external examiners at all times
2. Effective embedding in its administrative systems of its parallel undergraduate degree programmes being operated in conjunction with Southwest Jiaotong University in Chengdu

#### Enhancements made from the previous year

*Please highlight any enhancements made to the programme(s) or processes over the past year in this box.*

1. Improvement in the presentation of examination papers and their model solutions
2. Some evidence of reduced failure rates of Level 1 undergraduate modules

#### Matters for Urgent Attention

*If there are any areas which you think require urgent attention before the programme is offered again please note them in this box*

Please see the "Other comments" box at the end of this report.

#### For Examiners in the first year of appointment

1.	Were you provided with an External Examiner Handbook?	Y / N
2.	Were you provided with copies of previous External Examiners' reports and the School's responses to these?	Y / N
3.	Were you provided with a External Examiner Mentor?	Y / N

#### For Examiners completing their term of appointment

4.	Have you observed improvements in the programme(s) over the period of your appointment?	Y / N
5.	Has the school responded to comments and recommendations you have made?	Y / N
6.	Where recommendations have not been implemented, did the school provide clear reasons for this?	Y / N
7.	Have you acted as an External Examiner Mentor?	Y / N

*Please comment on your experience of the programme(s) over the period of your appointment, remarking in particular on changes from year to year and the progressive development and enhancement of the learning and teaching provision, on standards achieved, on marking and assessment and the procedures of the School*

## Standards

8.	Is the overall programme structure coherent and appropriate for the level of study?	Y
9.	Does the programme structure allow the programme aims and intended learning outcomes to be met?	Y
10.	Are the programme aims and intended learning outcomes commensurate with the level of award?	Y
11.	Did the Aims and ILOs meet the expectations of the national subject benchmark (where relevant)?	Y
12.	Is the programme(s) comparable with similar programmes at other institutions?	Y

*Please use this box to explain your overall impression of the programme structure, design, aims and intended learning outcomes.*

The curricula the 1<sup>st</sup> and 2<sup>nd</sup> Years of SEEE's undergraduate degree programmes quite closely match those of equivalent departments in the UK's leading universities. The differences where they exist are in timing, but these are unlikely to result in material differences in the distributions of the academic outcomes of students on graduation. At the 3<sup>rd</sup> and 4<sup>th</sup> Year level, the expertise and research interests inform the structure of the degree programmes, but without unbalancing it. The degree programmes retain sufficient generic content and those modules that reflect the research interests and expertise of SEEE academic staff enhance the learning experience in topics that will contribute to or influence professional practice.

In short, the aims, design and structure of SEEE's degree programmes, and their intended learning outcomes are entirely appropriate to modern Electronic and Electrical Engineering and related subjects and are likely to remain so for years to come.

13.	Is the influence of research on the curriculum and learning and teaching clear?	Y
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*Please explain how this is/could be achieved (examples might include: curriculum design informed by current research in the subject; practice informed by research; students undertaking research)*

Some of the 4<sup>th</sup> Year modules clearly relate to the research interests of the SEEE and are likely to contribute to the foundation knowledge required for studying for a postgraduate research degree in these areas.

14.	Does the programme form part of an Integrated PhD?	N
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*Please comment on the appropriateness of the programme as training for a PhD:*

N/A

15.	Does the programme include clinical practice components?	N
<p><i>Please comment on the learning and assessment of practice components of the curriculum here:</i></p> <p>N/A</p>		
16.	Is the programme accredited by a Professional or Statutory Regulatory Body (PSRB)?	Y
<p><i>Please comment on the value of, and the programme's ability to meet, PSRB requirements here:</i></p> <p>There is a broad based understanding that accreditation of an undergraduate degree programme by a relevant PSRB is essential to recruiting high calibre students and maintaining a reputation for excellence among the employers of graduates. However, a minority of informed observers feel that the requirements of accreditation are largely determined by established professional and interest groups and that meeting these can restrict the scope for innovation in developing curricula that meet the dynamics of fast-evolving disciplines like electronic and electrical engineering and related subjects. The effect is that UK universities tend to respond too slowly changes in the educational and training requirements of emerging trends in these disciplines and thereby creating economic and social disadvantage. Given the stranglehold of PSRBs on the curricula of electronic and electrical engineering degree programmes, the only way ensuring their relevance to contemporary and emerging trends is to hold frequent reviews of the structure of the 4<sup>th</sup> Year of MEng degree programmes and syllabuses of 4<sup>th</sup> year modules.</p>		

### Assessment and Feedback

17.	Does the programme design clearly align intended learning outcomes with assessment?	Y
<p><i>Please comment on the assessment methods and the appropriateness of these to the ILOs, in particular: the design and structure of the assessment methods, and the arrangements for the marking of modules and the classification of awards; the quality of teaching, learning and assessment methods that may be indicated by student performance.</i></p> <p>There is reliable evidence that the assessment methods used for 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> Year modules are appropriate to the learning outcomes of the degree programmes. A spot-check of the results of 3<sup>rd</sup> Year module ELEC3285 and of the examination results for this year of the modules that form the foundation of ELEC3285 (mainly but not exclusively topics related to circuit theory and design) indicate that their learning outcomes may not be met, or essential knowledge not being adequately assimilated. This is discussed more fully under sub-heading "Other comments".</p> <p>It is recommended that SEEE carries out a more thorough investigation of student performance on ELEC3285 and thematically linked 1<sup>st</sup> and 2<sup>nd</sup> Year modules, to reach a more solidly based conclusion if correlations between student performance in their assessments exist and, if so, extend this investigation of the efficacy of the teaching and assessment methods used for these foundation 1<sup>st</sup> and 2<sup>nd</sup> Year modules. At the moment, there is <i>prima facie</i> but not sufficiently secure evidence of a possible problem.</p>		
18.	Is the design and structure of the assessment methods appropriate to the level of award?	Y
19.	Were students given adequate opportunity to demonstrate their achievement of the programme aims and intended learning outcomes?	Y
<p><i>Please comment on the academic standards demonstrated by the students and, where possible, their performance in relation to students on comparable courses; the strengths and weaknesses of the students as a cohort:</i></p> <p>The academic standards demonstrated by the students at the 2<sup>nd</sup>/3<sup>rd</sup> and 4<sup>th</sup> year levels are similar to those achieved by other leading departments of Electronic and Electrical Engineering in the United Kingdom and, by extension, Europe. In particular, students achieving 1<sup>st</sup> Class Honours can claim equivalence to their peers from internationally leading universities.</p> <p>However, from a cohort perspective there are grounds for investigating whether or not these strengths are masking weaknesses in so far that students graduating at lower attainment levels (2ii and below) may not have demonstrated adequate understanding of foundation level knowledge in circuit theory and related topics that are regarded as central to modern professional electronic and electrical engineering.</p> <p>This matter will be dealt with under sub-heading "Other comments" below.</p>		

Please use this box to provide any additional comments you would like to make in relation to assessment and feedback:

See "Other comments", below.

### The Progression and Awards Process

20.	Were you provided with guidance relating to the External Examiner's role, powers and responsibilities in the examination process?	Y
21.	Was the progression and award guidance provided sufficient for you to act effectively as an External Examiner?	Y
22.	Did you receive appropriate programme documentation for your area(s) of responsibility?	Y
23.	Did you receive appropriate module documentation for your area(s) of responsibility?	Y
24.	Did you receive full details of marking criteria applicable to your area(s) of responsibility?	Y
25.	Were you provided with all draft examination papers/assessments?	Y
26.	Was the nature and level of the assessment questions appropriate?	N
27.	Were suitable arrangements made to consider your comments on assessment questions?	Y
28.	Was sufficient assessed work made available to enable you to have confidence in your evaluation of the standard of student work?	Y
29.	Were the examination scripts clearly marked/annotated?	Y
30.	Was the choice of subjects for final year projects and/or dissertations appropriate?	Y
31.	Was the method and standard of assessment appropriate for the final year projects and/or dissertations?	Y
32.	Were the administrative arrangements satisfactory for the whole process, including the operation of the Progression and Awards Board?	Y
33.	Were you able to attend the Progression and Awards Board meeting?	Y
34.	Were you satisfied with the recommendations of the Progression and Awards Board?	Y
35.	Were you satisfied with the way decisions from the School Special Circumstances meeting were communicated to the Progression and Awards Board?	Y

Please use this box to provide any additional comments you would like to make on the questions above:

Referring to question 26, above, i.e. "Was the nature and level of the assessment questions appropriate?" whilst the level of the assessments is entirely appropriate, there are potential issues with the nature of examination questions, particularly at the 1st Year level. I have raised this issue in my two previous reports.

Specifically, whilst the format of the questions on the unseen examination papers is proving to be sound for 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year units, indeed may even play a role in ensuring that graduating with 1<sup>st</sup> Class Honours degrees are the equal of those of world leading universities, this examiner remains unconvinced that the type of examination question used in unseen examination papers is appropriate at the 1<sup>st</sup> Year level as the dominant means of assessing whether or not students are meeting the learning outcomes of essential foundation knowledge.

This matter will be dealt with under sub-heading "Other comments" below.

#### Other comments

Please use this box if you wish to make any further comments not covered elsewhere on the form

The Head of School and the Director of Student Education of the SEEE asked the external examiners to investigate and comment on the difference in the performance levels achieved by the First Year students registered on the University of Leeds's new joint programme with Southwest Jiaotong University in Chengdu (SJUC). The attainment levels of these students were exceptionally high virtually across the board, markedly so compared with their counterparts registered in Leeds. Further, this almost uniformly high level of performance meant the usual performance discriminators of 1st, 2(i), 2(ii) etc performances had become less meaningful. Whilst this is not an issue for Level 1 students, it could become one in later years as these students progress towards their finals.

The Director of Student Education reported he had carried out an investigation of possible causes for the large difference in the outcomes of the SJUC and Leeds cohorts and his findings were that students registered at SJUC certainly showed higher attainment levels at mathematics, tended to have a more mature outlook towards university life and, more arguably, were recruited from a higher echelon of academic ability. Whilst the first two of these reasons are plausible, having observed first-hand the attainment levels of the SEEE's graduands and graduates for the past two years, the last is more questionable.

Therefore, I would invite the SEEE to investigate a fourth possible cause for this year's large difference in attainment levels of the SJUC and Leeds cohorts, namely the emphasis in Level 1 examination papers on "closed" examination questions based very largely on solving mathematical problems. Such examination questions are likely to play to obvious strengths of the SJUC students acquired before entering their university careers, and may not adequately test skills like verbal reasoning and synthesis

of different concepts. Such skills are important in engineering at the professional level and become increasingly important as undergraduate engineering students progress towards their finals.

There are several possible approaches that could alleviate this problem. Examples include wording examination questions in such a way that the model answer requires some explanation of the scientific, technological and engineering factors that underpin the derivation of a formula, and not just asking students to reproduce the mathematics used in such a derivation or solving problems. Another potential approach could be to ask students to discuss briefly or to state some of the engineering implications of a mathematically derived result. The effectiveness of any method or combination of them in closing the performance gap between the SJUC and Leeds based cohorts is likely to require monitoring results over several cycles of examinations. This is because devising and maintaining an assessment system that simultaneously combines rigour with achieving a wider distribution of marks that enables differences in attainment levels to be clearly identified is a complex problem.

Potentially relevant to this point, in this report I have once again raised the ongoing problem of the still high failure rates of Leeds based 1<sup>st</sup> Year students, and the possible role the format of the unseen examination questions could be playing in this unacceptable outcome. Unseen examination papers play a major, usually dominant role in assessing learning outcomes in engineering disciplines, and rightly so in the opinion of this examiner. However, success in examinations, especially unseen examination papers, also plays another important role, namely encouraging and empowering students to succeed in their chosen field of study. I respectfully suggest that while a high failure rate might be regarded as a clear and simple way of determining whether or not learning outcomes have been attained, it does little to encourage or empower to succeed in an era where students pay large sums of money to do so.

In my pointing this out, please do not mistake this as a call to lower standards. This is the opposite of the case. This is a plea that examiners adopt a more flexible approach to framing their examination question, for example by including one or more questions, or part questions on every 1<sup>st</sup> Year examination paper that requires verbal reasoning and/or asking questions about the engineering implications of mathematically derived results, or demonstrations by verbal or mathematical reasoning of a synthesis of concepts.

The Director of Student Education also drew the attention of the external examiners to an action the SEEE taken to mitigate the possible effect of the UCU's industrial action in February and March on the performance of students in a Level 3 module, namely ELEC3285. The action taken was to zero-weight the mark of one of two coursework elements that normally comprise the overall assessment of this module together with an unseen examination paper. The questions the external examiners were asked to address were: (1) did the mitigation adopted by the SEEE disadvantage or unduly advantage any students and (2) did this mitigation adequately compensate the cohort as a whole for any possible adverse effect of the UCU's industrial action. Since the topic of this module lies within my area of academic expertise and I had also reviewed the examination paper during the moderation phase, <<>> the other external examiner, agreed that I should report on our detailed investigation. My findings were as follows.

The mean marks of the coursework element that was included in the assessment and that of the examination paper were quite well aligned. Also it is reasonable to expect the student performance on the zero-weighted element would normally be broader similar to that of the other coursework element. As such, the evidence supports the SEEE's belief that it had adequately mitigated any disadvantage students taking this unit could have suffered due to the UCU's action earlier this year. Further, the assessment of the learning outcomes of this unit was unlikely to have been compromised by the SEEE's expedient. Evidence of this came from the high percentage (circa 30%) of students who gained an overall mark of 70% or more for this module.

However, my investigation of the results of module ELEC3285 revealed a different problem in that 22 out of the 53 students who took this module had failed the unseen examination, with 9 students failing the overall assessment. These numbers convert into failure rates of 41% for the unseen examination and 17% for the module as a whole, both very high values for a level 3 module. The results were examined for evidence that these high failure rates may have been due to the UCU's industrial action, but this was lacking, in keeping with the overall conclusion that the industrial dispute over academic staff pensions had not compromised the learning outcomes of this module.

To be clear, the unseen examination paper was judged to have been of a standard appropriate to a Level 3 module and in keeping with recent past papers, the high percentage of Firsts gained by students taking this module can be regarded as clear evidence of not only effective teaching, but also that learning was not compromised by the UCU's industrial action. The cause of this uneven performance is more likely to lie elsewhere.

In this respect, my reports for the past two years have raised the issue of the high failure rate of the SEEE's 1st Year modules, the waste this involves. I raise above the possible adverse effect this could have on student motivation. Whilst the SEEE are taking steps to ameliorate this situation, the failure rates on modules in ELEC 1130 (Circuit Theory) and ELEC1140 (Circuit Analysis and Design) remain disappointingly high. Both these modules not only contribute foundation knowledge to ELEC4285, they can also be considered as forming one of the principle pillars of professional Electronic and Electrical Engineering. Module ELEC3285 also builds on 1st Year courses on Physical Electronics and Device Theory, which is often a "minority interest" among students, and on 2nd Year module ELEC2130 (Electronic Circuit Design).

The latter module is assessed only by coursework and this year had a mean mark of 61% with zero fails, a level of performance out of keeping with the indifferent assessment results of thematically linked 1st and 3rd modules. If this pattern of variability in performance is apparent in the results of cohorts of students, this raises questions about student awareness of the thematic links between these modules and the suitability of the assessment models for these modules. This raises questions about the appropriateness of the method of assessment used for ELEC2130 and/or the questions I have raised about the appropriateness of the format of the questions on Level 1 examination papers.

It is respectfully suggested that the SEEE conducts an investigation that covers, initially, a review of the syllabuses of the units mentioned in the preceding paragraphs and of ELEC3285 and of the pattern of the assessments results for the past 2-4 years of these modules, to assess if and where correlations exist between student performance on these 1st and 2nd Year modules and their subsequent performance on ELEC3285. This knowledge could provide useful insight into reviewing the teaching and assessment of what is a core theme on modern electronic and electrical engineering and, possibly, in closing the performance gap between the SEEE's students registered in China and the UK.

Finally, at the suggestion of <<>> and with the SEEE's agreement, we sampled a small number of final year project reports that had been scored at different performance levels: from the highest mark awarded down to borderline 2(ii) in order to understand how the ranking was achieved and how it compared with the equivalent rankings in our own departments. <<>> compared our findings, which were very similar, and showed there was broad consistency from institution to institution. <<>> commented favourably on this in the formal meeting of the examiners.

To summarise, despite residual issues with quite high failure rates of some (rather than most) of 1st Year modules, the SEEE continues to set high standards in its teaching and assessing of Level 2, 3 and 4 undergraduate modules and has taken effective steps for improving its internal processes for preparing unseen examinations. Further, its initiative in setting up and operating parallel undergraduate degree programmes with Southwest Jiaotong University in Chengdu appears to be on a path to success.

### **Summary of Recommendations**

1. SEEE conducts a review of the syllabuses of units ELEC 1130, ELEC1140, ELEC2130 and ELEC3285 to establish
  - a) Whether or not thematic links are adequately developed to ensure students gain a clear insight into the links between module topics;
  - b) Whether or not there is a pattern in the assessment results for the past 2-4 years of these modules, and thereby establish if and where correlations exist between student performance on these 1st and 2nd Year modules and their subsequent performance on ELEC3285 and other relevant 3<sup>rd</sup> and 4<sup>th</sup> Year modules.
2. As a follow up to Recommendation 1, SEEE assesses whether or not it has the most appropriate staff teaching 1<sup>st</sup> Year Semester 1 modules.
3. Independently of the outcome of recommendation 1, SEEE conducts an investigation of the assessment model of ELEC2130 as a means of providing a reliable assessment of the learning outcomes of this module.
4. SEEE tests the effect of broadening the format of the questions of 1<sup>st</sup> Year examination papers on
  - a) The failure rate of Leeds based students with the goal of reducing the failure rate; and
  - b) The distribution of marks and their average for students registered at Southwest Jiaotong University in Chengdu with the goals of generating a wider distribution of marks and reducing the gap between the average marks of the Leeds and SJUC registered student cohorts.

## Part C: School Response to External Examiner Report

### Name of School and Head of School (or nominee)

*Title and Name of Examiner:*

*Subject(s):*

Electronic and Electrical Engineering

*Programme(s) / Module(s):*

Electronic Engineering  
Electronic and Electrical Engineering  
Electronic and Communications Engineering  
Electronics and Renewable Energy Systems  
Electronics and Computer Engineering  
Electronics and Nanotechnology  
Mechatronics and Robotics  
Music, Multimedia and Electronics

*Awards (e.g. BA/BSc/MSc etc):*

BEng/MEng/BSc

*Title and Name of Responder:*

*Position\*:*

Director of Student Education

*Faculty / School of:*

Faculty of Engineering / School of Electronic and Electrical Engineering

*Address for communication:*

*Email:*

*Telephone:*

*\*If the individual responding to the report is not the Head of School please state their position within the School.*

### Completing the School response

The completed School response (including the full original report) should be attached to an e-mail and sent to the Pro-Dean for Student Education in the relevant Faculty. Following approval by the Pro-Dean for Student Education, the School must send the response (including the full original report) directly to the External Examiner. A copy must also be emailed to the Quality Assurance Team at [qat@leeds.ac.uk](mailto:qat@leeds.ac.uk). External Examiners should receive a formal response no later than six weeks after receipt of the original report.

#### **Response to Points of innovation and/or good practice**

The embedding of the Joint-School programme with Southwest Jiaotong University, China, has been challenging but we have been determined to ensure that we mirror, as closely as possible, the standards and processes applied to the Leeds cohort.

#### **Response to Enhancements made from the previous year**

We are pleased that the presentation of examination papers and solutions continues to improve. This is largely due to the additional internal moderation we now apply via the Scrutiny Panel for Examination Papers.

#### **Response to Matters for Urgent Attention**

*If any areas have been identified for urgent attention before the programme is offered again please provide a specific response to them here:*

These are covered in the 'Other Comments' section below.

#### **Response to questions 1-7 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

N/A



## Standards

### **Response to questions 8 to 16 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We are pleased that the External Examiner has endorsed the coherence, appropriate level and learning outcomes of our programmes of study. We note the general observations concerning the influence of PSRBs, although any changes in this respect would need to come from a cross-institutional conversation with the relevant PSRB. The School does review the content of Level 'M' modules regularly and we agree that these modules need to be agile in responding to emerging trends.

## Assessment and Feedback

### **Response to questions 17 to 19 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We note the External Examiner's confirmation that the overall assessment and feedback processes are satisfactory and appropriate. (See below, 'Other Comments', for our response to the points raised concerning ELEC3285.)

## The Progression and Awards Process

### **Response to questions 20-35 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We note the External Examiner's confirmation that the procedures in place for viewing examination papers, students' scripts and project reports, and for the conduct of the Progression and Awards Board, are all satisfactory.

## Other comments

### **Response to items included in the 'Other Comments' section of the report**

The School thanks the External Examiner for the detailed comments provided in this section the report. On the relative attainment levels of the Leeds and SWJT cohort, we concur that, in addition to the other reasons mentioned, the use of closed examinations with mathematical content is also likely to be a factor (the SWJT students being more accustomed to this format of assessment). We agree that the focus of the assessment for ELEC1130 and ELEC1140 (circuit theory modules) needs to be more directed to understanding and application, rather than testing mathematical skills per se, which has sometimes been the case. The School has commenced a review of the assessment of ELEC1130 with this in mind. We are not convinced that a wholly different assessment format for Year 1 is wise, i.e. abandoning the closed (unseen) examination format, because this would leave students unprepared for this format in subsequent years. However, we are contemplating the use of a series of shorter (closed) tests in this module in order to provide better feedback, in place of the single closed examination at the conclusion of the academic year. We also concur that test/examination questions need to be framed with qualitative understanding as the primary focus.

We are pleased that External Examiner has agreed that the measures taken to alleviate the effects of the UCU action in the earlier part of the year for ELEC3285 were proportionate and appropriate. Although the failure rates in the final examination in this module may indicate problems beyond the UCU action, we don't think it is entirely appropriate to draw too many conclusions from this year's results. The content of this module is quite different to the circuit theory modules, and it is unlikely that the difficulties are related to students' lack of prior understanding. The module leader has undertaken to review the approach to teaching with a view to improving engagement in the topic.

We have, once again, untaken a thorough analysis of the Level 1 non-progression (which we agree is unsatisfactory and remains too high). However, the results indicate that there are multiple factors involved, and no obvious single cause. The School is redoubling its efforts to provide early identification for students 'at risk' of non-progression, and to provide support or intervention for those students.

We have reflected on the comments concerning the apparent disparity with the failure rates of ELE2130. Although the title of this module may imply that advanced circuit theory is the main topic, this module is actually much more about system design and focuses more on understanding system concepts. We believe that this is the reason for the much improved success rates. However, the module leader will review the assessment methods to ensure that there is sufficient rigour in the coursework items. (There is also an unseen MCQ test in this module which provides a different assessment format.)

**The University of Leeds**  
**EXTERNAL EXAMINER'S REPORT**

ACADEMIC YEAR: 2017-18

QAT Received 27/07/2018

**Part A: General Information**

**Subject area and awards being examined**

*Title and Name of Examiner:*

*Faculty /  
School of:*

*Electrical and Electronic Engineering*

*Subject(s):*

*Electrical and Electronic Engineering*

*Programme(s) /  
Module(s):*

BEng/MEng  
Electronic Engineering  
Electronic and Electrical Engineering  
Electronic and Communications Engineering  
Electronics and Renewable Energy Systems  
Electronics and Computer Engineering  
Electronics and Nanotechnology  
Mechatronics and Robotics

BSc  
Music, Multimedia and Electronics

BEng  
ELEC1701 Introduction to Engineering Mathematics  
ELEC2530 Power Electronics  
ELEC3560 Electric Drive Systems

Complimentary for MEng  
ELEC5564M Electric Power Generation by Renewable Sources  
ELEC5562M Power Electronics and Drives

*Awards (e.g.  
BA/BSc/MSc  
etc):*

BEng/MEng  
And  
BSc

**Part B: Comments for the Institution on the Examination Process and Standards**

**Points of innovation and/or good practice**

*Please highlight areas of innovation or good practice within the programmes or processes you have been involved with in this box.*  
This is my first year as an external examiner for Leeds. I was very impressed with the organisation of the School. All the communication I received from the School was clear and concise. The day of the examination board was also very well organised. I was particularly impressed with the presentation of the examination scripts and project reports. It was very easy to check the examinations papers I had been asked to review as part of my external examination duties. I was impressed with the marking processes – all the scripts I inspected had appropriate marking on the work from both the main marker and checker.

**Enhancements made from the previous year**

Please highlight any enhancements made to the programme(s) or processes over the past year in this box.

Not relevant because this was my first year.

### Matters for Urgent Attention

If there are any areas which you think require urgent attention before the programme is offered again please note them in this box

There are no areas which need urgent attention.

### For Examiners in the first year of appointment

1.	Were you provided with an External Examiner Handbook?	Y
2.	Were you provided with copies of previous External Examiners' reports and the School's responses to these?	N
3.	Were you provided with an External Examiner Mentor?	Y

### For Examiners completing their term of appointment

4.	Have you observed improvements in the programme(s) over the period of your appointment?	Y / N
5.	Has the school responded to comments and recommendations you have made?	Y / N
6.	Where recommendations have not been implemented, did the school provide clear reasons for this?	Y / N
7.	Have you acted as an External Examiner Mentor?	Y / N

Please comment on your experience of the programme(s) over the period of your appointment, remarking in particular on changes from year to year and the progressive development and enhancement of the learning and teaching provision, on standards achieved, on marking and assessment and the procedures of the School

Not relevant because this was my first year.

## Standards

8.	Is the overall programme structure coherent and appropriate for the level of study?	Y
9.	Does the programme structure allow the programme aims and intended learning outcomes to be met?	Y
10.	Are the programme aims and intended learning outcomes commensurate with the level of award?	Y
11.	Did the Aims and ILOs meet the expectations of the national subject benchmark (where relevant)?	Y
12.	Is the programme(s) comparable with similar programmes at other institutions?	Y

Please use this box to explain your overall impression of the programme structure, design, aims and intended learning outcomes.

The School offer a traditional suite of programmes which are well matched to the needs of society and engineering employers. The programmes are comparable to other universities offering these subjects. The levels of the examinations are appropriate and learning outcomes are suitable for students to go onto professional registration with the IET. There are also modules which reflect the specialised research areas of the School. This entirely appropriate for a research focused University.

13.	Is the influence of research on the curriculum and learning and teaching clear?	Y
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<p><i>Please explain how this is/could be achieved (examples might include: curriculum design informed by current research in the subject; practice informed by research; students undertaking research)</i></p> <p>The research interests of the School are represented in the 3rd and 4th year module. Students also undertake a substantial project which has a research element. There is evidence that the best work produced by the top students is novel and makes a publishable contribution to the discipline.</p>		
14.	Does the programme form part of an Integrated PhD?	N
<p><i>Please comment on the appropriateness of the programme as training for a PhD:</i></p>		
15.	Does the programme include clinical practice components?	N
<p><i>Please comment on the learning and assessment of practice components of the curriculum here:</i></p>		
16.	Is the programme accredited by a Professional or Statutory Regulatory Body (PSRB)?	Y
<p><i>Please comment on the value of, and the programme's ability to meet, PSRB requirements here:</i></p> <p>The degree programmes are assessed by the relevant accreditation body. This requirement is an essential aspect required by employers because they will expect their graduates to work toward professional registration. Many of the learning outcomes required by the PSRB will be met across several of the modules. The School should be able to modify and adapt to the latest developments in research and incorporate new material in their modules while still meeting the requirements of the PSRB.</p>		

### Assessment and Feedback

17.	Does the programme design clearly align intended learning outcomes with assessment?	Y
<p><i>Please comment on the assessment methods and the appropriateness of these to the ILOs, in particular: the design and structure of the assessment methods, and the arrangements for the marking of modules and the classification of awards; the quality of teaching, learning and assessment methods that may be indicated by student performance.</i></p> <p>In general the assessment methods are appropriate, and there is a good balance of coursework, laboratory, and examination type assessment.</p> <p>The new cohort from SWJTU has intergraded well and they have performed exceptionally. In my limited experience, students from China have a very good examination technique and a high score does not always translate to an in-depth understand of the subject some months after the examination. I would encourage the school to explore methods to ensure that there is longevity of the learning outcomes.</p>		
18.	Is the design and structure of the assessment methods appropriate to the level of award?	Y
19.	Were students given adequate opportunity to demonstrate their achievement of the programme aims and intended learning outcomes?	Y
<p><i>Please comment on the academic standards demonstrated by the students and, where possible, their performance in relation to students on comparable courses; the strengths and weaknesses of the students as a cohort:</i></p> <p>In my view the academic standards are comparable to other courses offered by Universities of similar standing.</p>		
<p><i>Please use this box to provide any additional comments you would like to make in relation to assessment and feedback:</i></p>		

No additional comments

### The Progression and Awards Process

20.	Were you provided with guidance relating to the External Examiner's role, powers and responsibilities in the examination process?	Y
21.	Was the progression and award guidance provided sufficient for you to act effectively as an External Examiner?	Y
22.	Did you receive appropriate programme documentation for your area(s) of responsibility?	Y
23.	Did you receive appropriate module documentation for your area(s) of responsibility?	Y
24.	Did you receive full details of marking criteria applicable to your area(s) of responsibility?	Y
25.	Were you provided with all draft examination papers/assessments?	Y
26.	Was the nature and level of the assessment questions appropriate?	Y
27.	Were suitable arrangements made to consider your comments on assessment questions?	Y
28.	Was sufficient assessed work made available to enable you to have confidence in your evaluation of the standard of student work?	Y
29.	Were the examination scripts clearly marked/annotated?	Y
30.	Was the choice of subjects for final year projects and/or dissertations appropriate?	Y
31.	Was the method and standard of assessment appropriate for the final year projects and/or dissertations?	Y
32.	Were the administrative arrangements satisfactory for the whole process, including the operation of the Progression and Awards Board?	Y
33.	Were you able to attend the Progression and Awards Board meeting?	Y
34.	Were you satisfied with the recommendations of the Progression and Awards Board?	Y
35.	Were you satisfied with the way decisions from the School Special Circumstances meeting were communicated to the Progression and Awards Board?	Y

*Please use this box to provide any additional comments you would like to make on the questions above:*

Feedback from School to see that they had accounted for comments

### Other comments

**Please use this box if you wish to make any further comments not covered elsewhere on the form**

My overall impression of the School is a coherent, well managed and organised part of the University of Leeds. It was a pleasure to fulfil the role of an external examiner and I look forward to making a contribution for the remainder of my term.

Just prior to the examination board meeting the Director of Education explained that one module had been affected by industrial action. The mitigations that the School made were appropriate and in my view had no detrimental impact on any of the students concerned.

The School has recently undertaken a significant expansion of its teaching activities through the partnership with SWJTU. I have also visited this university in previous months as part of general research discussion in my research area (railway power

systems). SWJTU is an outstanding University in China and has high entry standards. It is therefore no surprise that the SWJTU performed extremely well in the examinations, with extremely high marks on all modules.

One of the advantages of the UK based education system is the focus of student led and problem based learning. Unseen examinations based on bookwork and mathematical derivations are not always the best way to develop the skills for tackling challenging design and open ended problems.

In the short term I would encourage the examiners in the School to write more open ended design type questions, which test the ability to synthesis and analyse material from a broad base of understanding.

When the SWJTU students are in their final year they will also undertake the individual project. This is likely to be the first time they have been asked to work in this manner and I recommend that the School give appropriate consideration in order to help the students work independently and develop individual inquiry.

It would also be beneficial for me to meet with graduating and current students at future examination board meetings.

A final recommendation is that the School consider using an IET or IEEE style template for students to prepare their final report for their individual project. The standard of work produced by the top performing students is publishable, and having their report in an article format could facilitate publication.

## Part C: School Response to External Examiner Report

### Name of School and Head of School (or nominee)

*Title and Name of Examiner:*

*Subject(s):*

Electronic and Electrical Engineering

*Programme(s) / Module(s):*

Electronic Engineering  
Electronic and Electrical Engineering  
Electronic and Communications Engineering  
Electronics and Renewable Energy Systems  
Electronics and Computer Engineering  
Electronics and Nanotechnology  
Mechatronics and Robotics  
Music, Multimedia and Electronics

*Awards (e.g. BA/BSc/MSc etc):*

BEng/MEng/BSc

*Title and Name of Responder:*

*Position\*:*

Director of Student Education

*Faculty / School of:*

Faculty of Engineering / School of Electronic and Electrical Engineering

*Address for communication:*

*Email:*

*Telephone:*

*\*If the individual responding to the report is not the Head of School please state their position within the School.*

### Completing the School response

The completed School response (including the full original report) should be attached to an e-mail and sent to the Pro-Dean for Student Education in the relevant Faculty. Following approval by the Pro-Dean for Student Education, the School must send the response (including the full original report) directly to the External Examiner. A copy must also be emailed to the Quality Assurance Team at [qat@leeds.ac.uk](mailto:qat@leeds.ac.uk). External Examiners should receive a formal response no later than six weeks after receipt of the original report.

#### **Response to Points of innovation and/or good practice**

We are obviously pleased that the External Examiner found the organisation on the day of the Exam Board was 'impressive' and that the information provide was clear and accessible.

#### **Response to Enhancements made from the previous year**

N/A

#### **Response to Matters for Urgent Attention**

*If any areas have been identified for urgent attention before the programme is offered again please provide a specific response to them here:*

No points for urgent attention were raised.

#### **Response to questions 1-7 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We apologise that previous Examiners' reports were not made available – these should have been sent.

## Standards

### **Response to questions 8 to 16 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We are pleased that the External Examiner has endorsed the learning outcomes of our programmes of study, and commented on the research-led nature of some modules, which we believe offer a good balance in terms of relevance to current industry needs and opportunity to explore specialist research topics within the discipline. All our programmes of study are accredited by the appropriate PSRB (IET) who independently verify that all essential learning outcomes are met through every possible module pathway in each programme.

## Assessment and Feedback

### **Response to questions 17 to 19 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We note the External Examiner's confirmation that the overall assessment and feedback processes are satisfactory and appropriate. We also note the helpful comment concerning the SWJT cohort in terms of exam technique and we appreciate that this insight comes from personal experience. We are currently reviewing the assessments for some modules with a view to framing exam questions to probe qualitative understanding rather than ability to tackle analytical problems (which can be just exercises in mathematics). This will hopefully improve the balance between the performance of the Leeds and SWJT cohorts.

## The Progression and Awards Process

### **Response to questions 20-35 (and related comments)**

*Schools may provide a general response; however, where Examiners raise specific points these must be addressed individually:*

We note the External Examiner's confirmation that the procedures in place for viewing examination papers, students' scripts and project reports, and for the conduct of the Progression and Awards Board, are all satisfactory.

## Other comments

### **Response to items included in the 'Other Comments' section of the report**

We are pleased that External Examiner has agreed that the measures taken to alleviate the effects of the UCU action in the earlier part of the year for ELEC3285 were proportionate and appropriate.

We agree that the focus of the assessment, especially for ELEC1130 and ELEC1140 (circuit theory modules) needs to be more directed to understanding and application, rather than testing mathematical skills per se, which has sometimes been the case. The School has commenced a review of the assessment of ELEC1130 with this in mind.

We have been working with colleagues in China to consider how final year projects will be conducted and assessed and we recognise that there may be challenges in terms of developing students' abilities in an autonomous piece of work. However, we are confident that we are working very closely with staff in SWJT to share best practice from the Leeds approach to project supervision.

We note the request to have an opportunity to meet with students (graduating and pre-graduation) and we will endeavour to arrange this if possible. It can be difficult to do given that the timing of the Exam Board is after the term has finished, but we have sometimes been able to do this in previous years.

The suggestion to use a research paper format in place of some project reports is an interesting one, and we will have further discussion around this over the coming academic year.