



COMMONWEALTH *of* LEARNING

The background of the slide is a collage of blue-tinted images. At the top right, there's a close-up of hands holding a smartphone. Below that, a group of diverse students is looking at a screen together. In the middle, there's a view of a modern building's interior with a glass and metal ceiling. At the bottom right, a young woman wearing a hijab and a graduation cap looks upwards thoughtfully.

Status of Research and Engineering Programmes Offered Online

Romeela Mohee

The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to promote the development and sharing of open learning and distance education knowledge, resources and technologies.

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This report was prepared by Professor Romeela Mohee, Education Specialist: Higher Education, Commonwealth of Learning, Canada.

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COMMONWEALTH OF LEARNING

4710 Kingsway, Suite 2500

Burnaby, British Columbia

Canada V5H 4M2

Telephone: +1 604 775 8200

Fax: +1 604 775 8210

Web: www.col.org

Email: info@col.org

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Romeela Mohee

Education specialist, Higher Education



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TABLE OF CONTENTS

Introduction	1
Analysis	2
Engineering/Technical	2
Regulatory Framework	3
Curriculum and Qualification Range.....	3
Entry Requirements.....	3
Quality Assurance	3
Practical Aspects of Engineering and Sciences	4
Workplace Learning	5
Research/Doctoral	5
Curriculum.....	5
Admission Requirements	5
Coursework.....	6
Quality Assurance	6
Assessment	6
Policy Recommendations for Engineering/Doctoral Degrees Online	7
Regulatory Framework and Accreditation.....	7
Engineering Degrees.....	7
Doctoral Degrees.....	8
References	10
Annex 1: Open Universities Offering Online Engineering and Doctoral Programmes	11
Annex 2: List of Resources.....	14
Annex 3: University of Bristol Policy Framework for Distance Education.....	14
Annex 4: Master of Engineering UKOU – Learning Outcomes	16

STATUS OF RESEARCH AND ENGINEERING PROGRAMMES OFFERED ONLINE



Introduction

Online education refers to any educational programme delivered via the Internet to students using various technological, multimedia and social media objects and tools. Online learning has taken several names over the past two decades, the most common ones being eLearning, web-enhanced learning, technology-enabled learning, ICT learning, blended learning, hybrid learning and adaptive learning.

Picciano (2017) describes the evolution of online learning as occurring in five waves, starting in the early 1990s with the advent of the Internet and World Wide Web, and with universities developing digital technology using data communication systems and other tools. The first wave consisted of integrating interactive technology into existing distance education models and universities, such as occurred at the University of Maryland, USA, and Athabasca University, Canada. This movement grew rapidly to reach other continents, whereby faculty would share learning tools and engage in collaborative projects. Today, there are 27 fully operational online universities across the Commonwealth (Mishra, 2017), offering courses at bachelor's and master's levels in virtually all fields, ranging from social sciences, legal and business studies to engineering, technology and medical sciences.

The advantages of online learning are multiple, the most important ones being that self-paced, improved pedagogical materials are available to a greater number of learners, irrespective of their sociocultural backgrounds and their geographical location, and at a reasonable cost. Kanwar (2015), in a comparison of the costs of online education versus on-campus studies, stated: "The annual cost per student at the Korean National Open University is US\$186, compared with nearly \$3,000 for a campus student; Georgia Tech is offering its prestigious Masters in Computer Science course as a MOOC — because of which its existing cost of \$40,000 is being reduced to \$7,000."

There have been issues about the quality of online resources, especially related to integrating online resources such as massive open online courses (MOOCs) and open educational resources (OER) in formal education. Nonetheless, in one of the early studies on the effectiveness of online education, Piccoli et al. (2001) found no significant difference in student performance between face-to-face (F2F) and online delivery. Similarly, LaMeres and Plumb (2014) compared the performance of online and F2F students in a classroom and lab-based electronics course and found no significant difference in their achievements.

The provision of online and distance education for engineering and doctoral degrees is now established in many countries. Online doctoral degree programmes are increasingly offered in several subjects, from leadership and business to education. Regardless of discipline, online

doctoral programmes make it possible for students to remain in their work context while pursuing higher studies.

Technical doctoral and engineering degrees have complexities that are not seen in traditional business and arts degrees, the most important ones being the “recognition of professional degrees by professional bodies” and the need for access to laboratories, workplaces and design facilities.

This document highlights the status of research and engineering degrees currently offered online. There is big and increasing shift towards programmes being delivered online, although there are still challenges that will have to be overcome.



Analysis

This section highlights commonalities between 11 case studies of institutions offering doctorates and engineering degrees online. The case studies were developed by the Commonwealth of Learning (Bainbridge, 2017; Peters, 2017) and contain information on the degrees offered, the enrolment and graduation rates, and some aspects of the regulatory and quality assurance framework (Annex A). Nine of the case studies are of the following open universities: Athabasca University (AU, Canada), the University of the Philippines Open University (UPOU), The Open University of Tanzania (OUT), Wawasan Open University (WOU, Malaysia), The Open University (UKOU), the Open University of Sri Lanka (OUSL), the University of South Africa (Unisa), Universidad Nacional De Educación a Distancia (UNED, Spain) and FernUniversität (Germany). Two traditional universities were also included, Texas A&M and Lancaster University, as they have successful examples of offering doctoral degrees online.



Engineering/Technical

Engineering degrees have been offered by open universities and their equivalents almost since The Open University (UKOU) recruited its first students in 1971. The three largest open universities in Europe — UKOU and its Spanish and German equivalents, Universidad Nacional de Educación a Distancia (UNED) and FernUniversität — have engineering programmes accredited by their appropriate national bodies. In the USA, where there are no sizable single-mode distance universities, online and distance degrees in dual-mode universities often follow a remote classroom model (i.e., on-campus and off-campus students can see the same lectures online). The delivery of engineering degrees through an online mode in campus-based universities is common, especially at the master’s level, where higher-level study requires more theoretical and advanced academic work and the practical elements are assumed to have been gained earlier in the student’s studies. The University of Illinois’ master’s degrees and Stanford University’s master’s in Electrical Engineering are examples of such degrees where most modules are available online.

Regulatory Framework



The engineering degrees being offered by the open universities covered in this report are recognised locally and accredited by national accreditation agencies, whose basis of evaluation is learning outcomes. The online engineering degrees delivered by UKOU are accredited by the UK's Quality Assurance Agency for Higher Education (QAA) in accordance with its benchmark statement for engineering and professional engineering bodies, such as the Institution of Mechanical Engineers, the Institute of Engineering and Technology, the Institution of Engineering Designers and others. These degrees are also accredited by the Middle States Commission for Higher Education (MSCHE) in the USA. The learning outcomes of the BEng and MEng programmes are closely aligned with the UK Standards for Professional Engineering Competence (UK-SPEC), published by the Engineering Council. The civil, chemical, computer and electrical engineering programmes at OUSL are approved and recognised by the Institute of Engineers, Sri Lanka, while the technical and engineering degrees at Unisa are registered by the South African Qualifications Authority and accredited by the Engineering Council, South Africa (ECSA). The University of North Dakota's online mechanical engineering degree is fully accredited by the US Accreditation Board for Engineering and Technology (ABET).

Curriculum and Qualification Range



Open universities have been very selective in the engineering subjects they provide. This reflects local demand and the availability of alternative provision by other institutions, as well as the willingness of the relevant individual engineering accreditation bodies to support online/distance teaching of their subject. UKOU delivers a foundation degree, Bachelor in Engineering (BEng), Masters in Engineering (MEng) and MSc Engineering online. At OUSL, around 1,000 students are registered annually in civil, computer, electrical, electronic and mechanical engineering programmes. There are departments of civil, chemical, electrical, industrial, mechanical and mining engineering at Unisa. European universities such as UNED and FernUniversität offer degrees in mechanical, electrical, and computer engineering by distance. In China, the National Open University teaches a range of engineering subjects and its regional affiliates provide variations, depending on local demand. In general, the level of qualification may reflect the ease with which distance learning can be orchestrated to meet the needs of engineering students. In some jurisdictions, this can result in the offering of higher qualifications with a more research and theoretical focus (e.g., in the USA and by UKOU), whereas in other places, more technician-oriented qualifications are provided for those already in employment (e.g., in South Africa).

Entry Requirements



In most cases, the entry requirements are the same as for F2F programmes, with a couple of exceptions. For example, UKOU has no specific entrance requirements for their engineering degrees, and applicants require little previous formal education; however, the entry point

for engineering programmes is the Foundation degree, which is only available to students already working in engineering. OUSL has similar entry requirements for their online and F2F programmes: at least two GCE A levels are required in maths and physics, or an equivalent qualification in the OUSL foundation programmes. The entry routes at Unisa stipulate a minimum standard in maths and science-related subjects or a National Certificate award. These three examples demonstrate that open universities are quite specific in their entry requirements, which are similar to those for on-campus engineering courses, although in some cases, more flexibility is offered.

Quality Assurance



The same quality assurance (QA) mechanisms and regulations apply whatever the mode of study, and in many cases students, can select F2F or online versions of the same module. In single-mode open universities or their equivalent, the emphasis is on comparability and equivalence with what F2F institutions provide, and the involvement of external assessors and examiners is made explicit. Similar standards apply for on-campus and online engineering degrees. Open university students achieve their degrees by the accumulation of credits and meet particular degree regulations in the same way as F2F students. At UKOU, rules have been introduced to ensure that students have been successful before they can progress to higher-level study. For example, the BEng students start with the compulsory module *Personal and Career Development in Engineering*, which includes evaluation of their skills and knowledge and an analysis of gaps they need to fill. Progression rules require that students must have completed the equivalent of two years' full-time study before they take the honours module *Key Skills for Professional Engineers*. Similarly, students must complete feeder modules before they undertake the project module

One of the most significant QA challenges for online engineering degrees is providing and assessing practical aspects of the subject and any associated workplace learning.

Practical Aspects of Engineering and Sciences



All engineering programmes require that a considerable time be spent in field activities or laboratories and industrial placements. The model being practised in open universities includes practical work being carried out centrally at the university or at laboratories in other universities. OUSL has compulsory laboratory/workshop practice sessions and field work to be carried out on a F2F basis. Unisa has arrangements with industry whereby the laboratory component is carried out under the supervision of professional engineers. In the USA at the University of North Dakota (UND), the programme follows the same curriculum as UND's on-campus engineering programmes, but for distance students, "campus labs" taking 5–14 days are held on campus.

In the European open universities and in North America, very short periods (up to a few days) are used for intensive practical training and competence assessment. Increasingly, online simulations and models and the use of professional software are replacing laboratory-based

work in open and conventional universities. UKOU has compulsory residential schools to deal with practical work. These sessions can be held at other UK universities but with staff recruited by UKOU. It also has an interesting platform, the online *Open Engineering Laboratory* and *OpenScience Laboratory* sites, where resources are shared across a number of degrees and are also available on a subscription basis to other universities. The Open Engineering Lab allows students to complete hands-on activities and work collaboratively on design projects with peers.

Workplace Learning



The purposes of workplace learning extend beyond exposure to industrial processes and equipment to include the development of professionalism in would-be engineers. As per the Institute of Engineers Sri Lanka, exposure to professional engineering practice “complements the formal studies at the educational establishment” and provides the “opportunity to observe human and industrial relations, job organisation, maintenance, safety and environmental procedures from the point of view of the general workforce[, which] is an important component in the early preparation for a career as an engineering technologist.”

OUSL arranges industrial placements for engineering students. At Unisa, the student must secure an appropriate work situation and a workplace mentor approved by the university. In this case, the mentor must be a professional engineer who is registered with the ECSA.



Research/Doctoral

Most of the universities in this study (AU, UPOU, OUT, WOU and UKOU) began their doctoral programmes 10–17 years ago. The programmes are now well established and have proven to offer the same rigour and standards of F2F programmes.

Curriculum



The doctoral degrees currently offered online by the open universities in this study are in education, business administration, arts, economics and social sciences, on a full-time and part-time basis. The independent nature of studies for doctoral students/candidates means they work on their own throughout the programme, in regular communication with their supervisor. For those disciplines where laboratory or design work is required, provision must be made with research centres or partner universities. For example, UKOU operates through several affiliated research centres across the world to provide support to its doctoral students.

Admission Requirements



Most online or distance doctoral degree programmes require the applicant to have a master’s degree and in some cases a bachelor’s degree with a specific grade point average or level of qualification (usually a 2:1 honours degree) at the undergraduate level. Enrolment and

induction into programmes often require the student to be on site. For some disciplines, such as education, the major admission requirement for doctoral programmes and professional doctorates is practical experience in the field, along with a portfolio of previous study at an advanced level.

Coursework



In cases where there is coursework, students have to spend one week on campus to take specialised courses. In some programmes, students are requested to be on campus for 30 days a year and must meet their supervisors once per term. UK institutions typically offer doctoral programmes that incorporate online classes and seminars or brief on-campus residencies. Often, intensive summer courses are part of the curriculum. In the online courses, students have access to recorded lectures and can complete class assignments on their own schedules. The Web enables them to interact frequently with professors and peers. At AU, the first two years of doctoral programmes include coursework. Students then move on to the proposal stage, candidacy and dissertation by research. Many universities in the USA have requirements for taught elements or course work in various subjects such as research methodology. The coursework culminates in qualifying examinations before the student can undertake a dissertation.

Quality Assurance



Online doctoral degrees are subjected to the internal QA of the respective institutions, and in the cases of Lancaster University and Texas A&M, they follow the same QA procedures as F2F programmes. A university offering an online or distance doctoral programme is accredited/licensed by the appropriate national authorities under various acts/frameworks, such as the *Post-Secondary Learning Act* at AU, the Tanzania Commission for Universities, or the UK Quality Assurance Agency Framework for Higher Education. The online Doctor of Business Administration, offered by the University of Liverpool, UK, is accredited by the American Association of Collegiate Schools of Business. In general, supervisors are appointed by the relevant academic boards at the universities, and they have to subscribe to similar criteria of supervision as for other programmes.

Assessment



The overall assessment for a doctoral degree consists mainly of the thesis evaluation, either F2F or online. A viva voce for the thesis defence is usually organised at the end of the research period. External examiners are selected from different universities to ensure an independent evaluation. The traditional form for the doctoral oral examination (viva) works with no significant difference, regardless of whether it is conducted F2F or in an online virtual setting (e.g., via Skype). The virtual settings offer audio and visual tools, and the examination operates in the same fashion in either setting. At AU, proposal and dissertation oral defences are conducted through Adobe Connect using audio and video. The degree certificates do not mention the mode of study, i.e., whether the doctorate was obtained F2F or online.

POLICY RECOMMENDATIONS FOR ENGINEERING/DOCTORAL DEGREES ONLINE

This study points to a number of policy matters to be addressed by universities and regulatory bodies while considering the online delivery of engineering and research degrees.



Regulatory Framework and Accreditation

As online learning becomes more prevalent, policy considerations become important, especially pertaining to recognition, accreditation and jurisdiction. Usually, accreditation of higher education is conducted by a national body or a governmental agency, and in most countries, the same agency would be looking at on-campus and online higher education programmes. For example, in Canada, online programmes are recognised by virtue of being offered by a higher education institution that has been “licensed” by the provincial government government in whose jurisdiction the institution is located. The Career College Accreditation Program accredits online courses. The courses at Athabasca University have additional accreditation from the Middle States Commission on Higher Education. In terms of QA in the UK, Malaysia, South Africa and Australia, the guidelines and procedures are set by the local QA agency/authority — for example, the Malaysia Qualifications Authority, the QAA, the South African Qualifications Agency, and the Tertiary Education and Quality Standards Agency.

It is crucial that a proper regulatory framework be put in place to set regulations governing the provision of online and distance doctoral and research degrees and to provide for an independent QA body to oversee enforcement. A significant issue for policy makers is ensuring that online education providers observe the highest-quality academic requirements and do not become degree mills. To protect online learners, national authorities have to pay particular attention to accreditation agencies.



Engineering Degrees

Jurisdiction and Authorisation



Governments have the responsibility to develop and adapt authorisation policies and practices for online and distance post-secondary programmes at the national level, irrespective of jurisdiction or discipline. Online engineering programmes must be offered only in disciplines in which the institution has already been offering similar programmes via the regular mode. Criteria have to be established against which institutions will be given authorisation to develop and deliver engineering programmes, with details on the QA process to be put in place. These should include provisions for doing practical work, design work, industrial placements and work-based learning.

The programmes will need to be approved and accredited at the national level by the relevant qualification agencies and professional bodies. Compliance with the requirements of all the bodies has to be clearly demonstrated. Furthermore, careful attention must be applied when universities wish to operate in jurisdictions outside their own regions or countries.

Approach to Engineering Provision Through Online and Distance Education



Universities should be allowed to proceed with certain strands of engineering online and at a distance, with other strands approved only once credibility has been fully established. For example, subjects such as software engineering, where much of the practical teaching in any university will use online platforms, could be readily approved. Other engineering subjects, such as civil and aeronautical engineering, could require a detailed case that explains how aspects that are not readily taught online are to be handled.

Adequate provision of practical and workplace elements should minimise the risks in allowing online programmes to offer teaching in engineering. Both approaches that have worked in other countries (i.e., online resources and workshops/practical laboratories in other institutions) could be adopted. Individual universities could adopt different strategies for laboratory practice, such as provision of their own facilities or collaboration with other providers. Formal agreements have to be established with corresponding institutions for the provision of facilities. However, there is merit in considering a national or at least collaborative approach to online resources. Open universities could consider collaboration with the UKOU to enable student access by students and extend their current provisions.



Doctoral Degrees

Policy Framework



A policy framework has to be developed by institutions proposing to offer doctoral and research degrees through online and distance modes. Appropriate approval procedures must be followed for the selection and training of academic supervisors. The departments and institutions must also demonstrate how the proposed online doctoral programme fits with the strategic direction of the department or university. At the same time, adequate resources for supervising online candidates have to be provided.

Quality Assurance for Doctoral Degrees



Doctoral degrees delivered by a distance mode must offer a quality of provision comparable to F2F programmes. The rigour of the QA requirements must be emphasised. Models requiring only research for the programme of work leading to the award of doctoral degrees should have no difference between the QA requirements of online and on-campus modes. When coursework is involved, block teaching can be envisaged, and the courses will require a similar attention to

pedagogy, instructional design, learner-support systems and assessment as for any online course. Careful attention has to be brought to the student engagement and assessment procedures. Interactions with students (especially formative and assignment feedback and responses to queries) must be properly recorded in a timely manner.

Regarding doctoral degrees with laboratory work, arrangements should be provided to enable students to undergo the practical component at other universities or research centres. Formal agreements must be secured with research centres or partner universities to support the practical work and to define the supervisory aspects required. Academic faculty leading successful PhD programmes should have expertise in online teaching and learning in order to produce innovative and engaging online doctoral programmes. Doctoral students must be given reasonable opportunities for discussion with peers and for participation in debates, conferences and workshops in the same way and to the same extent as on-campus students.

The doctoral degree should provide a learning experience comparable to that enjoyed by on-campus students, especially with respect to intellectual challenge, fully in line with the standards expected of any doctoral programme.



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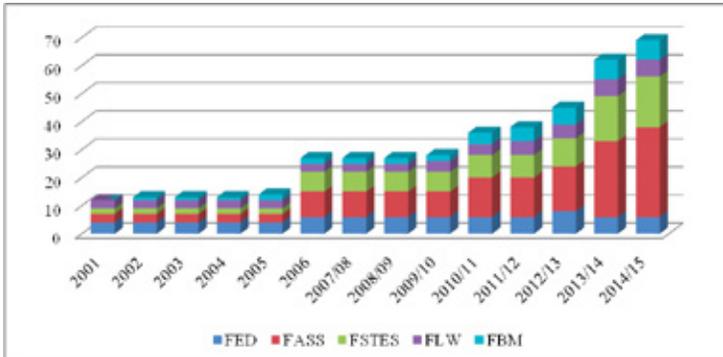
ANNEX 1. Open Universities offering Online Engineering and Doctoral Programmes

	The Open University (UKOU)
Degrees Offered	Foundation degree, BEng, MEng, PhD
Entry Requirements	Foundation degree in Engineering
Accreditation and QA	<p>The IMechE (Institution of Mechanical Engineers), IET (Institution of Engineering and Technology), IED (Institution of Engineering Designers, and CIBSE (Chartered Institution of Building Services Engineers). A number of other professional engineering institutions recognise open university degrees because they have already been accredited by one of these institutions (including EI – Engineers Ireland, ICE – Institution of Civil Engineers, IET – Institution of Engineering and Technology, IGEM – Institution of Gas Engineers and Managers, IHE – Institute of Highway Engineers, IMarEst – Institute of Marine Engineering, Science and Technology, RINA – Royal Institution of Naval Architects, and SOE – Society of Operations Engineers).</p> <p>Learning outcomes based, determined by accrediting process and engineering institutions.</p>
Learner Support	Online/correspondence teaching and a personal tutor

	Open University of Sri Lanka (OUSL)
Degrees Offered	Civil, Computer, Electrical, Electronics, Mechanical Engineering (BEng)
Entry Requirements	GCE A level in Physical Sciences (Maths and Physics) OUSL foundation programme
Accreditation and QA	<p>Learning outcomes based, determined by accrediting process and engineering institutions</p> <p>Course approved and recognised by the Institute of Engineers, Sri Lanka</p>
Learner Support	Laboratory/workshop practice sessions (F2F), field visits, industrial training with supervisors from OUSL

	University of South Africa (UNISA)
Degrees Offered	Civil, Chemical, Electrical, Industrial, Mechanical Engineering, Mining Engineering
Entry Requirements	Mathematics and sciences prerequisites, N3 national certification
Accreditation and QA	<p>Engineering Council of South Africa (ECSA)</p> <p>Learning outcomes based, determined by accrediting process and engineering institutions</p>
Learner Support	<p>Online/correspondence teaching and supervisory support from ECSA</p> <p>One-year integrated learning laboratory workshop under ECSA supervision</p>

Athabasca University (AU)	
Degrees Offered	Doctor of Distance Education Doctor of Business Administration
Enrolment	71 (EdD) and 43 (DBA) (2017)
Accreditation and QA	The <i>Post-Secondary Learning Act</i> authorises the university's governing council to grant degrees. AU is accredited by the Middle States Commission on Higher Education, an institutional accrediting agency recognised by the US Secretary of Education and the Council for Higher Education Accreditation (CHEA).
Learner Support	All programmes are offered exclusively online. A few courses require on-site lab work, which is conducted at AU or an affiliated lab facility closer to the student's home.
Graduation Rates	22 graduates (EdD) and 20 graduates DBA

The Open University of Tanzania (OUT)																																																																																																										
Degrees Offered	Faculty of Arts and Social Sciences: Doctor of Philosophy Faculty of Education: Doctor of Philosophy in Education Faculty of Science, Technology and Environmental Studies: Doctor of Philosophy Faculty of Law: Doctor of Philosophy in Law Faculty of Business Management: Doctor of Philosophy in Business Management																																																																																																									
Enrolment	 <table border="1"> <caption>Enrolment Data (Estimated from Chart)</caption> <thead> <tr> <th>Year</th> <th>FED</th> <th>FASS</th> <th>FSTES</th> <th>FLW</th> <th>FBM</th> <th>Total</th> </tr> </thead> <tbody> <tr><td>2001</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>25</td></tr> <tr><td>2002</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>25</td></tr> <tr><td>2003</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>25</td></tr> <tr><td>2004</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>25</td></tr> <tr><td>2005</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>25</td></tr> <tr><td>2006</td><td>5</td><td>10</td><td>5</td><td>5</td><td>5</td><td>35</td></tr> <tr><td>2007/08</td><td>5</td><td>10</td><td>5</td><td>5</td><td>5</td><td>35</td></tr> <tr><td>2008/09</td><td>5</td><td>10</td><td>5</td><td>5</td><td>5</td><td>35</td></tr> <tr><td>2009/10</td><td>5</td><td>10</td><td>5</td><td>5</td><td>5</td><td>35</td></tr> <tr><td>2010/11</td><td>5</td><td>15</td><td>5</td><td>5</td><td>5</td><td>40</td></tr> <tr><td>2011/12</td><td>5</td><td>15</td><td>5</td><td>5</td><td>5</td><td>40</td></tr> <tr><td>2012/13</td><td>5</td><td>20</td><td>5</td><td>5</td><td>5</td><td>45</td></tr> <tr><td>2013/14</td><td>5</td><td>25</td><td>5</td><td>5</td><td>5</td><td>50</td></tr> <tr><td>2014/15</td><td>5</td><td>35</td><td>5</td><td>5</td><td>5</td><td>60</td></tr> </tbody> </table>	Year	FED	FASS	FSTES	FLW	FBM	Total	2001	5	5	5	5	5	25	2002	5	5	5	5	5	25	2003	5	5	5	5	5	25	2004	5	5	5	5	5	25	2005	5	5	5	5	5	25	2006	5	10	5	5	5	35	2007/08	5	10	5	5	5	35	2008/09	5	10	5	5	5	35	2009/10	5	10	5	5	5	35	2010/11	5	15	5	5	5	40	2011/12	5	15	5	5	5	40	2012/13	5	20	5	5	5	45	2013/14	5	25	5	5	5	50	2014/15	5	35	5	5	5	60
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Accreditation and QA	Quality assured and regulated by the Tanzania Commission for Universities External evaluation of the university and accreditation of academic programmes by statutory and accreditation bodies																																																																																																									
Learner Support	All doctoral degrees are research based. Proposal defences and vivas (oral exams) are normally done F2F at OUT headquarters in Dar es Salaam.																																																																																																									
Graduation Rates	73 PhDs granted																																																																																																									

Wawasan Open University (WOU)																									
Degrees Offered	PhD in Arts and Humanities (including Education) PhD in Psychology, Sociology, Political Science PhD in Economics, Marketing, Business Studies, Finance and Banking PhD in Computing and Technology																								
Enrolment	104 (EdD) and 43 (DBA) (2017)																								
Accreditation and QA	WOU was given SETARA Tier-5 (Excellent) rating by the Education Ministry in 2012. WOU received a COL RIM certificate in 2013.																								
Graduation Rates	<p>Total Graduates</p> <table border="1"> <thead> <tr> <th></th> <th>Postgraduate</th> <th>Undergraduate</th> </tr> </thead> <tbody> <tr> <td>2010</td> <td>38</td> <td>-</td> </tr> <tr> <td>2011</td> <td>80</td> <td>70</td> </tr> <tr> <td>2012</td> <td>100</td> <td>265</td> </tr> <tr> <td>2013</td> <td>81</td> <td>260</td> </tr> <tr> <td>2014</td> <td>92</td> <td>308</td> </tr> <tr> <td>2015</td> <td>116</td> <td>377</td> </tr> <tr> <td>Total</td> <td>507</td> <td>1280</td> </tr> </tbody> </table> <p>Cumulative Enrolment by School (2007-2015)</p> <p>SBA - 10,340 Students (60.97%) SST - 4,567 Students (26.93%) SFLS - 1,286 Students (7.58%) SELC - 760 Students (4.48%) CGS - 5 Students (0.03%)</p> <p>SBA - School of Business & Administration SST - School of Science & Technology SFLS - School of Foundation & Liberal Studies SELC - School of Education, Languages & Communications CGS - Centre for Graduate Studies</p> <p>Based on the total cumulative enrolment of 16,958 students who have benefited from WOU's unique educational experience from January 2007 to December 2015.</p>		Postgraduate	Undergraduate	2010	38	-	2011	80	70	2012	100	265	2013	81	260	2014	92	308	2015	116	377	Total	507	1280
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University of the Philippines Open University (UPOU)	
Degrees Offered	Doctor of Philosophy in Education Doctor of Communication (DComm)
Enrolment	104 (EdD) and 43 (DBA) (2017)
Accreditation and QA	Compliance with CHED regulations. UPOU is a member of the International Council for Open and Distance Education, the Asian Association of Open Universities and the Philippine Society for Distance Learning.
Learner Support	Each programme is a combination of coursework and research. The courses are offered online. Students are encouraged to defend their proposal and dissertation F2F, but an online platform can be used.
Graduation Rates	47 EdD graduates and 10 DComm graduates

ANNEX 2. List of Resources

Accreditation of online colleges in Canada: www.schoolsincanada.com/Accreditation-of-Online-Colleges.cfm

ICDE, *Final Report on Study of Regulatory Frameworks for Distance Education* (2011): https://issuu.com/icde/docs/regulatory_frameworks_for_de_final_report

Online Doctoral Degree Requirements. https://study.com/online_degree.html

Online PhD Programs: <https://www.online-phd-programs.org/top-international-online-phd-programs/>

Quality Assurance Agency for Higher Education. *The UK Quality Code for Higher Education – Chapter B11: Research Degrees* (2015): <http://www.qaa.ac.uk/en/Publications/Pages/Quality-Code-Chapter-B11.aspx#.WahE1MaQzIU>

TEQSA Australia: <http://www.teqsa.gov.au/>

UKOU Engineering Programmes Sample Course Description for Students Intending to Study the Module: www.openuniversity.edu/courses/programmes/.../bachelor-of-engineering

ANNEX 3. University of Bristol Policy framework for distance education

Reference: www.bristol.ac.uk/academic-quality/facultyadvice/policy Policy for Research Degrees by Distance Learning

1. Introduction

- 1.1. This Policy defines the requirements for research degrees that are conducted through distance learning. It should be read in conjunction with the *Regulations and Code of Practice for Research Degree Programmes*, which sets out the University's requirements in relation to all research students. The additional considerations that must be taken into account for distance learning are presented below.

2. Definition of Research Degrees by Distance Learning

- 2.1. Students studying for Research Degrees by Distance Learning undertake the majority of their research away from the University either in the UK or overseas. This is combined with compulsory visits to the University and appropriate remote support.
- 2.2. Research Degrees by Distance Learning will be appropriate for students where relevant resources are largely available locally or online.

- 2.3. The significant factors in determining whether a Research Degree by Distance Learning is appropriate are a) where the primary means of supervision is remote and b) where the student's research project is not dependent on the University's on-site facilities.
- 2.4. Research students who are away from the University to undertake fieldwork, etc. are not classified as studying for a Research Degree by Distance Learning. There are however elements of this Policy that may act as good practice for those students, such as how to engage with the University when not on campus.
- 2.5. A Research Degree by Distance Learning is not a split-site PhD, where the student spends time at both the University and another institution within a fully collaborative structure. For split-site PhDs a written agreement is always required with the other organisation, while for distance learning the primary relationship is normally with the research student.
- 2.6. If however a student who wishes to study by distance learning has a research project that is dependent on using the facilities of an employer or another organisation, a written agreement must be put in place (see Section 3).
- 2.7. The expectations set out in this Policy may also be relevant to educational partnerships developed through other routes, where the location of study is deemed to be distance learning.

3. Distance learning and partnership agreements

- 3.1. A partnership agreement is required for a Research Degree by Distance Learning if the student's project is **dependent** on using the facilities of another organisation (see the *Regulations and Code of Practice for Educational Collaborative Arrangements*). The agreement may be limited to covering access to facilities and to any intellectual property issues, depending on the nature of the project and on the University's relationship with the other organisation.
- 3.2. The approval process, which includes a due diligence consideration and an enhanced approval route where a partnership is required (see Section 6), will be completed before any written agreement is set up.
- 3.3. If the student is based in, or has access to, an environment that is conducive to research (such as through a research or educational organisation) but is not dependent on its facilities, a letter must be obtained from the organisation to confirm its general support. A partnership agreement is not required in these cases.

ANNEX 4. Master of Engineering UKOU – Learning Outcomes

Reference : www.openuniversity.edu/.../masters-degrees/master-of-engineering. Submitted by Peters 2017.

Educational Aims

The MEng is a 480-credit qualification which aims to satisfy in full the Engineering Council's (EC's) educational requirements for Chartered Engineer (CEng) status. It requires 360 credits of study up to OU level 3 (FHEQ level 6) followed by 120 credits at postgraduate level (FHEQ Level 7).

Like the OU BEng (Hons), its learning outcomes are closely aligned with the EC's UK-SPEC generic output standards for degrees in engineering that are appropriate for CEng. These output standards fall into two groups. First, there are degree-level general outcomes covering acquisition of knowledge and understanding, intellectual abilities, practical skills and general transferable skills. Then there are more specific outcomes related to engineering under the headings: Underpinning science and mathematics; Engineering analysis; Design, Economic, social and environmental context; and Engineering practice.

In accordance with the UK Quality Assurance Agency for Higher Education benchmark statement on engineering, the MEng programme aims to differentiate itself from the BEng (Hons) programme by stimulating a deepening of technical understanding, some broadening to include management or other non-technical topics, an additional emphasis on team/group working, providing an increase in the use of industrially-relevant applications of engineering analysis, and expecting an enhanced capability for independent learning and work.

As a graduate of the MEng you will have demonstrated that you have satisfied these learning outcomes with your assessed work. Your enhanced engineering ability will have been acquired through involvement in individual and group design projects as well as continuous personal study and tuition.

Knowledge and Understanding

On completion of this qualification, you will be able to:

- use your knowledge and understanding, acquired and developed through study and through personal investigations as an individual and as part of a team, of relevant engineering principles, analytical methods, modelling techniques, quantitative methods and appropriate computer software to respond systematically to complex engineering challenges
- review or report on appropriate social, commercial, ethical/legal and management practices in contemporary engineering in your present or future professional work.

Practical and/or Professional Skills

On completion of this qualification, you will be able to:

- propose reasoned solutions to engineering challenges (even where uncertain conditions exist) using a range of engineering analysis and evaluation skills applied to a working knowledge of particular materials, equipment, processes and products, workshop and laboratory methods, technical literature and other information, taking into account appropriate quality standards, codes of practice, industry standards, and intellectual property and contractual issues
- undertake and manage engineering projects responsibly, professionally and ethically, with regard to environmental risk and sustainability, and the framework of relevant legal requirements (covering issues such as personnel, health, safety, etc.)
- evaluate the significance of findings through investigation of your chosen specialism using a comprehensive understanding of the engineering principles, new and emerging technologies and current professional practice, when applied to an unfamiliar situation.

Key Skills

On completion of this qualification, you will be able to:

- practise a range of transferable skills (including problem solving, communication, working with others – especially team-working – IT skills, information retrieval, planning self-learning and career development, and reflection), at a level appropriate to a senior professional engineer.

Teaching, Learning and Assessment Methods

Teaching and learning is through a combination of study materials (including study guides, textbooks, set books, audio and video material, home activity kits, and module-related software), optional face-to-face or online tutorials, plus individual tutor feedback.

Assessment is through a mix of written, tutor-marked assignments (TMAs), computer-marked assignments (CMAs), examinations and end-of-module assessments (EMAs).



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4710 Kingsway, Suite 2500
Burnaby, BC V5H 4M2 Canada
Phone + 604 775 8200 / Fax + 604 775 8210

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