



SND+FI

Module Details

Short Title:	SND+FI DRAFT		
Full Title:	Software Defined Networking and Future Internet Technologies		
Module Code:	n/a	NFQ Level:	9
		ECTS Credits:	7.5
Valid From:	Academic Session - 2014/15 (October 2014)		
Administrator:	Xiaojun Wang		
Module Coordinator:	Xiaojun Wang		
Description:	<p>This is a TGI module for PhD students on structured PhD programs as a Graduate Training Element. This module will be delivered by two international experts: Prof Xiaoming Fu (University of Göttingen, Germany) and Prof. Ken Calvert (University of Kentucky, USA). This module introduces several exciting new ideas in latest networking research. After a quick recap of TCP/IP network principles, emerging topics including software defined networking, network function virtualization, and several proposals for future Internet architectures will be explored. The latter includes information-centric, mobility-centric, and expressive Internet architectures. Emphasis throughout will be on current research and proposed solutions. The course is facilitated with hands-on sessions with some of the technologies, oral presentations, quizzes, group problem-solving and discussions.</p>		
Learning Outcomes:			
<i>On successful completion of this module the learner will be able to</i>			
<ol style="list-style-type: none"> 1. Explain the difference between SDN and traditional Internet routing and forwarding architectures. 2. Explore several contemporary use cases for Software-Defined Networking. 3. Describe the advantages and disadvantages of the main features of the current Internet protocol architecture. 4. Explain the design goals of at least two different Future Internet Architecture projects and their motivation. 5. Compare the advantages and disadvantages of the current Internet and proposed future Internet architectures, with respect to a given use case. 			
Pre-requisite learning			
Module Recommendations			
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>			
No recommendations listed			
Requirements			
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>			
Students should have basic programming skills, and should be numerate to an undergraduate level in computing, electronic engineering or a related area, including at least attended an undergraduate computer networking course.			

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Module Content & Assessment

Indicative Content**Introduction to SDN**

Assignment: discussion, read research papers

OpenFlow and SDN controller

Assignment: read research papers

SDN and network virtualization

Assignment: hands-on lab exercise

SDNs in data centers

Assignment: reading research papers, discussion

Middleboxes and network function virtualization with SDN

Assignment: hands-on lab exercise

Future Internet Architecture: Overview of the problem

Assignment: reading research papers, group problem-solving

Information-centric networking paradigm

Assignment: written report on a research paper

Dealing with mobile endpoints: problems and solutions

Assignment: reading papers, discussion

Designing for evolution: eXpressive Internet Architecture

Assignment: hands-on lab exercise

The Challenge of Transport Evolution

Assignment: written report on a research paper

Assessment Breakdown**%**

Course Work

100%

End of Semester Formal Examination

0%

Coursework Breakdown

<i>Type</i>	<i>Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Assignment	Students will be asked to complete homework assignments	None	20	n/a
Group presentation	Students will be asked to do presentations after reading research papers	None	30	n/a
Report (s) (written / oral)	Each student will be asked to write a report on the latest technologies assigned to him/her	None	50	n/a

DCU reserves the right to alter the nature and timings of assessment

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Module Workload & Resources

Workload	Full-time hours per semester

<i>Type</i>	<i>Description</i>	<i>Hours</i>
Lecture	3 hours/day * 10 days	30
Lab	Lab/exercises 3 hour/day * 3 days	9
Seminars	Literature review and understanding	30
Seminars	Oral presentations	20
Assignment	Reports	40
Independent learning	Independent learning time	50
Total Workload		179.00

Resources

Module Managers & Teachers

Module Coordinators

<i>Semester</i>	<i>Staff Member</i>	<i>Staff Number</i>
Semester 1	Xiaojun Wang	75020688
Semester 2	Xiaojun Wang	75020688
Autumn	Xiaojun Wang	75020688

Module Teachers

<i>Staff Member</i>	<i>Staff Number</i>
No Teacher Staff Assigned	