Internet Technologies and Regulation

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<th>Academic Year</th>
<th>2017-18, Michaelmas Term</th>
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<tr>
<td>Day and Time</td>
<td>Thursdays, Weeks 1-8, 14:00 – 17:00</td>
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<tr>
<td>Location</td>
<td>Lecture Theatre, Ship Street Centre, Ship Street, Oxford, OX1 3DA</td>
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<tr>
<td>Course Providers</td>
<td>Dr Joss Wright, Oxford Internet Institute, <a href="mailto:joss.wright@oii.ox.ac.uk">joss.wright@oii.ox.ac.uk</a></td>
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<tr>
<td>Teaching Assistant(s)*</td>
<td>Corinne Cath, <a href="mailto:corinne.cath@oii.ox.ac.uk">corinne.cath@oii.ox.ac.uk</a></td>
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<td></td>
<td>Samantha Bradshaw, <a href="mailto:samantha.bradshaw@oii.ox.ac.uk">samantha.bradshaw@oii.ox.ac.uk</a></td>
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<tr>
<td>Prerequisites</td>
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*Comments and enquiries in the first instance to the course Teaching Assistant(s).

**Background and aims**

The pace of technological change and innovation in the use of information and communication technologies (ICTs) poses significant challenges for policy-makers across a variety of issues, whilst regulation and policy will, in turn, shape the range of choices that can be made about the use, design and development of ICTs. Informed academic study of the network of networks that comprise the Internet must, therefore, be firmly grounded in a sophisticated understanding of the underlying technology and policy contexts in which these networks are embedded. In particular, valuable insights are to be gained by studying policy debates relating to the Internet in the broader context of ICT policy more generally, such that continuity and change can be observed.

**Key themes**

- How far should policy-makers and regulators intervene when new technologies radically transform existing business models and social structures?
- In which ways has the Internet transformed the nature of policy and regulation to govern ICT’s?
- How are debates about security, identity and intellectual property being reshaped by Internet technologies?
- To what extent do legal and regulatory issues need to be re-thought in view of the fact that Internet technologies often cross national boundaries?
- How far can regulation shape the “code” of the Internet?
- What can previous disruptive technologies such as the Gutenberg press and telegraph - and the policy debates that surrounded them - tell us about the impact of the Internet?

**Course Objectives**

This multi-disciplinary course will expose students to basic communications and computer science materials on the core technological principles of the Internet, as well as more traditional social science materials such as public policy documents and reports as well as academic texts. In order to reinforce
students’ appreciation of the importance of adopting a technologically-informed approach to studying the Internet, the course will cover several key policy debates such as content regulation, privacy and security and Internet governance, in each case identifying the extent to which the range of policy options is narrowed or expanded by fast-moving technological innovation, and shifts in public policy and regulation. This will, in addition, enable students to appreciate the broader implications and relevance of academic study in this field.

**Learning Outcomes**

By the end of this course, students will:

- Have a good understanding of the origins and history of the Internet, and will appreciate how these factors have shaped (and in turn been shaped by) Internet policy.
- Have a basic understanding of Internet architecture and its development and will appreciate how this has shaped (and in turn been shaped by) Internet policy.
- Have a sophisticated understanding of key Internet-related policy debates, within the wider context of ICT policy.
- Be able to appreciate the broader policy implications of the academic research undertaken in other components of this degree.

**Teaching Arrangements**

The course is taught in eight weekly classes, each consisting of a lecture and group discussion.

**Assessment**

The summative assessment will take the form of a three-hour examination that will take place in the 0th week of Hilary term where any three of eight questions related to the topics covered in the course must be answered.

Any student failing this assessment will need to follow the rules set out in the OII Examining Conventions regarding re-sitting failed examinations.

**Formative Assessment**

Students will be required to answer two practice exam questions, under exam conditions, on any of the 8 topics covered. These answers will provide a means for students to obtain feedback on the progress they have achieved as well as helping to prepare them for their summative assessment.

**Topics**

1. History and development of the Internet
2. Internet architecture
3. Internet governance and regulation
4. Privacy and security
5. Identity
6. Copyright
7. Content regulation and filtering
8. Emerging Technologies

**Key to Readings**

A reading list is given below for each class. We recommend that students read as widely as possible in preparation for each class, however those items marked with an asterisk (*) are essential reading and MUST be read by all students each week. Many of the course’s issues are covered in Ian Brown

**Week 1: History and development of the Internet**

While the Internet became a mass medium during the 1990s, its direct antecedents stretch back to the early 20th century, and historically through the telegraph to the Gutenberg press. This lecture will cover the network’s origins and history, and explore the ways in which it has shaped and been shaped by public policy.

Key questions:

- How far can the Internet be understood within traditional patterns of print, broadcast and telecommunications regulation, and how far has it generated a novel response from policymakers?
- Which aspects of the Internet are best understand as an evolution of the printing press, radio, television, newspaper and telegraph, and which as having entirely new patterns of social impact?

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Week 2: Internet architecture

Unlike the circuit-switched telephone network, the internet carries data in packets that are routed through a federation of networks that communicate using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite. This lecture will cover the basic concepts and policy implications of the Internet technical architecture, including the end-to-end principle, the IP “hourglass”, and how real-time and best-effort reliable communications are carried over lossy networks. It will also explain the significance of newer developments such as IPv6.

Key questions:
- Is the “future” Internet likely to be an evolutionary or revolutionary change from the current network?
- How much “smarter” should the Internet become?
- How do social, economic and technological factors interact in the development of the Internet?

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<tr>
<th>Author</th>
<th>Title</th>
<th>Edition</th>
<th>Publisher</th>
<th>Pages</th>
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<tbody>
<tr>
<td>Lessig, Lawrence</td>
<td>Code: And Other Laws of Cyberspace, Version 2.0</td>
<td>2006</td>
<td>New York: Basic Books</td>
<td>Parts I &amp; II</td>
</tr>
<tr>
<td>Zittrain, Jonathan</td>
<td>The Future of the Internet - And How to Stop It</td>
<td>2002</td>
<td>New Haven: Yale University Press</td>
<td>Part II</td>
</tr>
<tr>
<td>Clark, David</td>
<td>Why the Internet is the way it is (and why it will be very different in ten years).</td>
<td>2006</td>
<td>OII webcast at: <a href="http://webcast.oii.ox.ac.uk/index.cfm?view=Webcast&amp;id=20060428_143">http://webcast.oii.ox.ac.uk/index.cfm?view=Webcast&amp;id=20060428_143</a></td>
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Week 3: Internet governance and regulation

International telephony and telegraphy links were built slowly on a bilateral basis between governments and then under the auspices of the United Nations. The Internet has been a global federation of networks since its earliest days, with little concept of national borders, whose standards are set by a voluntary Internet Engineering Task Force. Its few centralised resources are managed by ICANN, a private Californian corporation, under an agreement with the US Department of Commerce.
The United Nations has responded with the Internet Governance Forum, an annual conference where countries and a range of other stakeholders discuss governance issues. This lecture will cover the range of bodies that have an Internet governance role, and the tensions between them.

Key questions:

- How far can governments control the decentralised and global Internet?
- Is ICANN or the ITU the best model for future Internet governance?
- Can supranational governance bodies build political legitimacy without explicit intergovernmental agreement?

* Mueller, Milton


- Part I

*Hoffman, P*


Weber, Rolf H. and Grosz, Mirina


Drake, William J.


Mueller, Milton

*Networks and States.* 2010. MA: MIT Press.

- Parts I and II

Mueller, Milton and Kuerbis, Brenden


Brown, Ian and Ziewitz, Malte


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**Week 4: Privacy and security**

The increased data gathering, sharing and storage capabilities of digital technology has led to an explosion in the amount of personal data processed by governments and companies - often without a commensurate investment in measures to protect that data. This lecture will cover key technological and legal trends in data protection and information security; and consider the two key drivers of security and efficiency in government use of personal data.

Key questions:

- How can privacy and security be built “by design” into information systems; and how can regulation influence the use of such techniques?
How have the “Snowden revelations” of large-scale communications surveillance by the US and its allies affected regulation of such programmes, and the behaviour of the technology companies targeted by them?

- Anderson, Ross J.  
  - Part III

- Mayer-Schönberger, Viktor  

- "Argomaniz, Javier"  
  * “European Union responses to terrorist use of the Internet” 2015 Cooperation and Conflict, 50(2): 250-268

- Court of Justice of the European Union  
  * Google Spain SL and Google Inc. v Agencia Española de Protección de Datos (AEPD) and Mario Costeja González, Case C-131/12, 13 May 2014, at http://curia.europa.eu/juris/document/document.jsf?text=&docid=152065&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=243691

- Sommer, Peter Brown, Ian  

- Anderson, David  

- Hildebrandt, Mireille Tielemans, Laura  

- Brown, Ian Marsden, Chris  

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Week 5: Identity

On the Internet, nobody knows you’re a dog... This lecture will look at the range of centralised, federated and user-centric identity management technologies being developed and how governments and business are implementing them.

Key questions:
- Who on the Internet needs to be able to verify your non-canine status?
- How do different models of identity management impact on citizens’ privacy rights?
- How are national identity schemes likely to evolve?
**Week 6: Copyright**

The ability of information technologies to distribute, at almost zero marginal cost, perfect digital copies of creative works has presented a significant challenge to global copyright law. This lecture will cover the policy responses of governments, intergovernmental organisations and large right holders, and the Digital Rights Management and file-sharing technologies that are key to the policy debate.

Key questions:

- Can the file-sharing genie be put back in its bottle?
- How well are Technological Protection Measures and anti-circumvention laws maintaining the efficacy of copyright law?
- How equitable are global intellectual property agreements such as TRIPS and the WIPO Copyright Treaty?

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*Benkler, Yochai*  
- Part I
Week 7: Content regulation and filtering

Governments have long regulated the broadcast media, and are increasingly turning their attention to content distributed via the Internet. Democracies and non-democracies alike are requiring that Internet Service Providers block access to child abuse images, hate speech, and in some cases political and minority groups. This lecture will cover the blocking technologies used and the policies being developed in a range of nations including the UK, the US, China and Australia.

Key questions:

- Can controls on the “chaos and cacophony” of the Internet be put in place consistent with constitutional protections for freedom of expression?
- How effective are current and future blocking technologies likely to be?

*Deibert, Ronald
Palfrey, John
Rohozinski Rafal
Zittrain, Jonathan L.

- Chapters 1-3

Wu, Tim

Goldsmith, Jack
McIntrye, T J
Scott, Colin


Brown, Ian


Dutton, William H.
Dopatka, Anna
Hills, Michael
Law, Ginette
Nash, Victoria


Brown, Ian
Marsden, Chris


Livingstone, Sonia
Smith, Peter


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**Week 8: Emerging Technologies**

The internet’s development has resulted in a variety of ongoing challenges for governance and regulation. As new technologies emerge that make connectivity, information gathering, information processing, and automated decision-making ubiquitous, the implications of emerging technologies and how these can be regulated effectively are of great importance.

This lecture will examine regulatory issues surrounding emerging technologies such as the Internet of Things, smart cities, autonomous vehicles, and increased use of machine learning.

Key questions:

- Do emerging technologies such as autonomous vehicles, smart cities, and the internet of things present fundamentally new governance challenges?
- How effective are current governance approaches likely to remain in light of these developments?

*Rolf H. Weber*  

*Scott R. Peppet*  
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<tr>
<td>Norbert Wiener</td>
<td><em>Cybernetics: Or Control and Communication in the Animal and the Machine</em> (1948)</td>
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**Notes**

Students should note that over the course of the year, small changes may be made to the content, dates or teaching arrangements set out in this reading list, at the course provider's discretion. These changes will be communicated to students directly and will be noted on the internal course information website.