



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros de
Telecomunicacion

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

93000850 - Ict market policy and regulation

DEGREE PROGRAMME

09AQ - Master Universitario En Ingenieria De Telecomunicacion

ACADEMIC YEAR & SEMESTER

2018/19 - Semester 2

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Learning guide

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1. Description

1.1. Subject details

| | |
|---------------------------------------|---|
| Name of the subject | 93000850 - Ict market policy and regulation |
| No of credits | 3 ECTS |
| Type | Optional |
| Academic year of the programme | Second year |
| Semester of tuition | Semester 4 |
| Tuition period | February-June |
| Tuition languages | English |
| Degree programme | 09AQ - Master universitario en ingenieria de telecomunicacion |
| Centre | 09 - Escuela Tecnica Superior de Ingenieros de Telecomunicacion |
| Academic year | 2018-19 |

2. Faculty

2.1. Faculty members with subject teaching role

| Name and surname | Office/Room | Email | Tutoring hours * |
|---|--------------------|-------------------------|---|
| Fernando Herrera Gonzalez | C-426 | fernando.herrera@upm.es | Sin horario. Appointment arranged by email. |
| Luis Castejon Martin (Subject coordinator) | C-426 | luis.castejon@upm.es | Sin horario. Appointment arranged by email. |

| | | | |
|-----------------------|-------|----------------------|---|
| Zoraida Frias Barroso | C-431 | zoraida.frias@upm.es | Sin horario. Appointment arranged by email. |
|-----------------------|-------|----------------------|---|

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Skills and learning outcomes *

3.1. Skills to be learned

CE7 - Capacidad para realizar la planificación, toma de decisiones y empaquetamiento de redes, servicios y aplicaciones considerando la calidad de servicio, los costes directos y de operación, el plan de implantación, supervisión, los procedimientos de seguridad, el escalado y el mantenimiento, así como gestionar y asegurar la calidad en el proceso de desarrollo.

CG1 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación.

CG2 - Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio.

CG3 - Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios.

CG4 - Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades.

CG5 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CT1 - Capacidad para comprender los contenidos de clases magistrales, conferencias y seminarios en lengua inglesa.

CT2 - Capacidad para dinamizar y liderar equipos de trabajo multidisciplinares.

CT3 - Capacidad para adoptar soluciones creativas que satisfagan adecuadamente las diferentes necesidades planteadas.

CT4 - Capacidad para trabajar de forma efectiva como individuo, organizando y planificando su propio trabajo, de forma independiente o como miembro de un equipo.

CT5 - Capacidad para gestionar la información, identificando las fuentes necesarias, los principales tipos de documentos técnicos y científicos, de una manera adecuada y eficiente.

CT6 - Capacidad para emitir juicios sobre implicaciones económicas, administrativas, sociales, éticas y medioambientales ligadas a la aplicación de sus conocimientos.

3.2. Learning outcomes

RA139 - Ser capaz de definir un plan estratégico de empresa basado en información interna y externa

RA133 - Capacidad de entender y seleccionar las diferentes alternativas de comunicaciones

RA145 - Capacidad de desarrollar estrategias funcionales y globales en una empresa

RA174 - Comprender los fundamentos económicos de la regulación (competencia perfecta, fallos de mercado, efectos del monopolio, oligopolios, competencia oligopolística)

RA175 - Construir modelos de costes de un operador para determinar los precios (comerciales y regulados) según estándares históricos, corrientes y LRIC

RA177 - Comprender la situación de la competencia en los mercados de telecom (fijo, móvil, banda ancha, televisión, Internet), problemas de competencia

RA180 - Comprender la regulación de las ofertas de contenidos en redes multiservicio

RA189 - Enfoques de la regulación alternativos al enfoque mainstream neoclásico: la Escuela Austriaca de Economía (Hayek y Mises)

RA10 - Saber realizar una presentación de carácter técnico, ante una audiencia de pares, que describa el trabajo

realizado y sus resultados, de forma clara y bien estructurada, en el tiempo establecido, y usando un lenguaje preciso

RA188 - Regulación europea del Roaming

RA76 - Habilidad de comunicación oral y escrita

RA171 - Saber determinar los costes de una red a efectos de fijar precios, según metodologías de contabilidad de costes (históricos, corrientes y LRIC)

RA187 - Regulación de la Interconexión de redes

RA182 - Comparativa internacional de los mercados de telecom, consolidación de operadores europeos

RA184 - Competition policy: análisis de mercados, determinación de operadores con poder significativo de mercado, fallos de mercado y remedios

RA173 - Comprender las causas por las que regular los mercados

RA186 - Regulación antitrust en Europa: caso más conocidos (Wanadoo, Google y otros)

RA176 - Analizar la regulación del acceso al par de cobre

RA117 - Conocer los aspectos básicos de los sistemas y servicios de radiocomunicaciones, su marco regulatorio y estándares técnicos de referencia.

RA120 - Conocer los aspectos básicos de las tecnologías utilizadas en los sistemas de comunicaciones móviles

RA147 - Capacidad de analizar y desarrollar estrategias empresariales en el contexto de la economía digital

RA148 - El alumno tendrá una visión general sobre los elementos claves que determinan el pasado, presente y una visión estratégica sobre el futuro del sector de las de las tecnologías de la información y las comunicaciones. Será capaz de realizar análisis de entorno e identificar el comportamiento de los agentes que participan en el ecosistema digital

RA33 - Capacidad para abordar y desarrollar en grupo casos prácticos de análisis, diseño, dimensionamiento, simulación, pruebas y su gestión técnico-económica de sistemas de comunicaciones que usen redes satelitales, redes fijas troncales y de acceso óptico y/o eléctricas y redes móviles incluyendo el concepto de "Internet de las Cosas"

RA41 - Capacidad de presentar los resultados de lo anterior en grupo de forma oral y escrita

RA170 - Conocer los fundamentos económicos de la regulación de las telecomunicaciones

RA138 - Conocer los procesos de toma de decisiones implicados en la dirección de empresas

RA172 - Analizar las finanzas de un operador de telecom, comparativamente con las de una OTT, para conocer EBITDA, rotación activos, ROE, caja, Capex

RA178 - Comprender la regulación del acceso de fibra óptica

RA179 - Comprender la regulación de las redes móviles y los operadores móviles virtuales

RA181 - Comprender el impacto de la regulación en la estrategia de las compañías regadas

RA183 - Subastas de espectro

RA8 - Adquirir experiencia en el planteamiento de un problema de negocio y en su resolución mediante aplicaciones y servicios, con una adecuada toma de decisiones de diseño, realizada en equipo, teniendo en cuenta todos los contenidos de la asignatura

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

4. Brief description of the subject and syllabus

4.1. Brief description of the subject

An introduction based on some recent press headlines that the student will be able to answer with the knowledge and case studies developed in the RTIC course

- Public consultation on the regulatory environment for platforms, online intermediaries, data and cloud computing and the collaborative economy.
- Telcos 1H-2016 results. Telefónica earns 22% less and cuts the dividend of 2016 and 2017 by debt. Orange grows at a rate of 5% in Spain with revenues of 3,706 million. Vodafone is slowing down in Spain; revenues amounted to 2,496 million euros, 0.3% more than in the same period of the previous year.
- Six Big Technology Questions for President Trump. Will you overturn the net neutrality rules? What exactly is your stance on encryption and digital privacy?
- Brussels vetoes Telefónica for the sale of O2 due to competition issues. The European Commission believes that the purchase by Hutchison would reduce the rivalry in the mobile in the United Kingdom.
- The "all in one" number of bundles of Telcos grow, but with a more significant expense. Ten million households have contracted telephony, Internet and television bundles, according to the CNMC. The cause of this boom in the packages is the need for operators to monetise the critical investments in the

- deployment of new networks (fibre and 4G) and the purchase of audiovisual rights, in particular in football.
- Brussels accuses Google of paying manufacturers to install their search engine "The dominant companies have the responsibility of not abusing restricting competition, Google has abused its dominant position". The Commission accuses him of forcing the manufacturers and operators of mobile phones and tablets that operate with Android to install their services by default.
 - The CNMC makes access to Telefónica's fibre network more flexible. The regulator softens the requirements to access poles and conduits for operators. The agency has approved the revision of the MarCo offer (passed in 2009), which regulates access to Telefónica's civil works infrastructures.
 - Europe wins, the Internet is still free. The new EU regulation on net neutrality benefits users and helps innovation and democracy
 - Alierta and Colao ask the EU to put an end to Internet monopolies. The president of Telefónica says that the European regulations are obsolete and asymmetric, which only regulates the telcos while leaving the OTTs free to run, they do not respect privacy or security, and they know the lives of all of us.
 - MásMóvil will use the mobile and fibre optic network of Orange after not renewing the agreement with Movistar. The operator reached an agreement with Orange when it bought Jazztel, and the European Commission forced it to divest itself of some assets and rent others to authorise the operation.
 - Orange studies segregate its fixed wholesale business and its fibre network.
 - The CNMC proposes to deregulate the market of the Mobile Virtual Operators (MVNO)
 - The net cost of the universal telecommunications service in 2013 amounted to 19.5 million euros
 - The 5G will displace the television channels of its frequencies in 2022. The households will have to retune their televisions after the decision of the EU to assign the band of the digital TV to the new mobile Internet

Course description

This course provides in-depth knowledge and practices about the economics of telecom, Internet and ICT sectors as well as about the digital, network and collaborative economy and the online platforms. It provides to the student the necessary and sufficient sectoral and specific regulation of telecommunications and Internet markets that every Master in Telecommunications Engineering should require when analysing a business case, together with the competition rules applicable to dominant firms to prevent monopolistic power.

This course is a 'must' whether working in a Telco, an Internet or Over-The-Top (OTT) firm, a startup, a consultancy, an investment bank, a technology provider, or regulatory authority.

The regulation is a substantive part of the business of any operator, OTT, supplier, or startup. Its impact is far-reaching: how the retail services are produced through wholesale services; the online platforms; prices and costs; the commercial offer of bundled products. It also affects the business strategy of an operator, OTT or MVNO that enters the market;, as well as the potential consolidation of firms and role of competition authorities in such deals. Other critical hot topics are the demand for spectrum that makes possible the growth of mobile services to 4G and

5G networks; the need to improve Internet access services by prioritising traffic; the zero-rated services that begin to emerge, etc.

The so-called 'collaborative economy' poses significant challenges to how the economic life of companies has been organised and regulated. The also so-called 'online platforms' led by the OTTs, such as e-commerce marketplaces, search engines, online payment systems, online advertising, big data systems, social networks and video streaming and video sharing services, represent significant opportunities and challenges for the economy. Online platforms play an increasingly central role in social and economic life and are an essential part of a thriving Internet-driven economy. Therefore, it is necessary to make a thorough evaluation of the function of online platforms, their economics and how, if appropriate, to regulate them. One approach could be self-regulation co-regulation to ensure flexibility and updating. Cybersecurity demands strict measures.

The last part of the course provides students with an overview of the different challenges of the Internet, digital services, and the Information Society: intellectual property, network neutrality, data privacy, electronic commerce, electronic payments (mobile payment), and so forth.

External lectures from directors of regulation and policy coming from Telco operators and OTTs

It is expected to hold sessions with managers in charge of regulatory and policy affairs inside Telco operators and OTTs, to know the point of view of each one of them. Also, a lecture about alternative approaches to neoclassical mainstream regulation based on the Austrian School of Economics (Mises and Hayek). Another session consisting of a roundtable that will bring together directors of regulation of operators that will discuss the questions that students will previously submit. Moreover, a final session with a conference on Internet regulation by the director of regulatory affairs of an OTT company.

4.2. Syllabus

1. General framework for the regulation of telecommunications and the digital economy
 - 1.1. Formation of commercial offers based on regulated wholesale offers: services xDSL, fibre, OMV, contents
 - 1.2. The ecosystem and the value chain of the Telco and the Internet
2. Finances of Telco operators and OTT from a regulatory perspective
 - 2.1. Economic and financial analysis of companies
 - 2.2. Investments in assets, cash flows and margins
 - 2.3. Impact of regulation on investors
 - 2.4. The case of Telefonica
3. Economic fundamentals of Telco regulation
 - 3.1. Economics of Telcos
 - 3.2. Perfect competition model
 - 3.3. Monopoly, oligopoly, monopolistic competition
 - 3.4. Effects of monopoly and regulatory intervention
4. An analysis of the impact of regulation
 - 4.1. Theoretical foundation
 - 4.2. Static effects
 - 4.3. Dynamic effects
 - 4.4. Application case
5. Regulation of the telecommunications market
 - 5.1. Methodology of market analysis and imposition of PSM obligations
 - 5.2. Regulation of network interconnection in Spain: OIR and AMLT offers
 - 5.3. Regulation of fixed broadband access in Spain: access to copper pair and fibre optic networks. Regulated Telefonica's offers OBA, ORLA, Marco, NEBA (VULA)
 - 5.4. Regulation of virtual mobile operators (MVNO) in Spain: commercial agreements supervised by the NRA
 - 5.5. Regulation of commercial offers and bundles in Spain
 - 5.6. Regulated costs of operators for pricing in Spain: cost theory, standards and cost models
6. Economy of the Internet and networks (network economy): regulation of the digital ecosystem

- 6.1. Online platforms
 - 6.1.1. Multisided and two-sided markets
 - 6.1.2. Network effects
- 6.2. The collaborative economy: private transport, accommodation and banking sector
- 6.3. Single Digital Market and electronic commerce
- 7. General competition rules
 - 7.1. Anti-competitive behaviour and mitigation
 - 7.2. Abuse of market power
 - 7.2.1. Excessive and predatory prices. Denial of supply. Margin narrowing (margin squeeze)
 - 7.3. Collusion (cartels)
- 8. Competition cases: anti-monopoly (antitrust) and mergers and acquisitions of companies
 - 8.1. EC Europe case: Wanadoo / Telefonica case in ADSL services in Spain
 - 8.2. EC Europe case: Google Android and Google search engines and AdWords
 - 8.3. Spanish CNMC case of mergers between companies: absorption of Digital + by Telefónica
 - 8.4. Mergers and acquisitions of operators in European countries. Cases Telefonica O2 UK and Telefónica Deutschland E-Plus
- 9. Alternative economic approaches to current regulation: the Austrian School of Economics
- 10. Working sessions with consultants, directors of regulation and policy of operators and OTT
 - 10.1. Roundtable with directors of regulation of operators on current issues
 - 10.2. Invited conference on Internet regulation: director of regulatory affairs and policy of an OTT firm

5. Schedule

5.1. Subject schedule*

| Week | Face-to-face classroom activities | Face-to-face laboratory activities | Other face-to-face activities | Assessment activities |
|------|---|------------------------------------|-------------------------------|--|
| 1 | <p>Presentation of the Course Duration: 01:00 Lecture</p> <p>General framework for the regulation of telecommunications and the digital economy Duration: 01:00 Lecture</p> | | | <p>Case 1 "Book reading summary (part I) of the course textbook about fundamentals of regulation" (see bibliography) Individual work Continuous assessment Duration: 08:00</p> |
| 2 | <p>General framework for the regulation of telecommunications and the digital economy Duration: 02:00 Lecture</p> | | | <p>Case 2 "Market intervention, regulation and policy" Group work Continuous assessment Duration: 02:00</p> |
| 3 | <p>Finances of Telco operators and OTT from a regulatory perspective Duration: 02:00 Lecture</p> | | | <p>Case 3 "Financial implications of regulation in Telco and OTT firms" Group work Continuous assessment Duration: 02:00</p> |
| 4 | <p>Economic fundamentals of Telco regulation Duration: 02:00 Lecture</p> | | | |
| 5 | <p>Economic fundamentals of Telco regulation Duration: 02:00 Lecture</p> | | | <p>Case 4 "Economics of regulation: perfect competition and monopoly" Group work Continuous assessment Duration: 02:00</p> |
| 6 | <p>An analysis of the impact of regulation Duration: 02:00 Lecture</p> | | | <p>Case 5 "Book reading summary (part II) of the course textbook about fundamentals of regulation" (see bibliography) Individual work Continuous assessment Duration: 08:00</p> |
| 7 | <p>An analysis of the impact of regulation Duration: 02:00 Lecture</p> | | | <p>Case 6 "Economic analysis of impacts of regulation" Group work Continuous assessment Duration: 02:00</p> |
| 8 | <p>Regulation of the telecommunications market Duration: 02:00 Lecture</p> | | | |

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|----|--|--|--|---|
| 9 | Regulation of the telecommunications market Duration: 02:00 Lecture | | | Case 7 "Cost of wholesale regulated access with copper local loop (OBA ULL): replicability of PSM commercial offers" Group work Continuous assessment Duration: 02:00 |
| 10 | Regulation of the telecommunications market Duration: 02:00 Lecture | | | Case 8 "Cost of wholesale regulated access with fiber local loop (NEBA Local): replicability of PSM commercial offers" Group work Continuous assessment Duration: 02:00 |
| 11 | General competition rules Duration: 02:00 Lecture | | | Case 9 "Real competition case: explanation of the market problem and case methodology" Group work Continuous assessment Duration: 02:00 |
| 12 | Economy of Internet and networks (network economy): regulation of the digital ecosystem Duration: 02:00 Lecture | | | Case 10 "Online platforms (network effects) and collaborative economy" Group work Continuous assessment Duration: 02:00 |
| 13 | Alternative economic approaches to current regulation: the Austrian School of Economics Duration: 02:00 Lecture | | | Case 11 "Application of Austrian School to regulation" Group work Continuous assessment Duration: 02:00 |
| 14 | Working sessions with consultants, directors of regulation and policy of operators and OTT Duration: 02:00 Additional activities | | | Case 12 "Summary of the keypoints of guest lectures" Individual work Continuous assessment Duration: 02:00 |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | Final exam for non-continuous assessment students Written test Final examination Duration: 01:30 All the same cases of the course required for continuous assessment, including a final dissertation in the exam day. Problem-solving test Final examination Duration: 30:00 |

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The subject schedule is based on a previous theoretical planning of the subject plan and might go to through

experience some unexpected changes along throughout the academic year.

6. Activities and assessment criteria

6.1. Assessment activities

6.1.1. Continuous assessment

| Week | Description | Modality | Type | Duration | Weight | Minimum grade | Evaluated skills |
|------|---|-----------------|---------------|----------|--------|---------------|--|
| 1 | Case 1 "Book reading summary (part I) of the course textbook about fundamentals of regulation" (see bibliography) | Individual work | No Presential | 08:00 | 15% | 5 / 10 | CG3 CG4 CG5 CT2 CT6 CG2 CG1 CT4 CT5 |
| 2 | Case 2 "Market intervention, regulation and policy" | Group work | No Presential | 02:00 | 5% | 5 / 10 | CG5 CT1 CG1 CT4 |
| 3 | Case 3 "Financial implications of regulation in Telco and OTT firms" | Group work | No Presential | 02:00 | 10% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CT4 |
| 5 | Case 4 "Economics of regulation: perfect competition and monopoly" | Group work | No Presential | 02:00 | 10% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |

| | | | | | | | |
|----|--|-----------------|---------------|-------|-----|--------|--|
| 6 | Case 5 "Book reading summary (part II) of the course textbook about fundamentals of regulation" (see bibliography) | Individual work | No Presential | 08:00 | 15% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
| 7 | Case 6 "Economic analysis of impacts of regulation" | Group work | No Presential | 02:00 | 10% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
| 9 | Case 7 "Cost of wholesale regulated access with copper local loop (OBA ULL): replicability of PSM commercial offers" | Group work | No Presential | 02:00 | 10% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
| 10 | Case 8 "Cost of wholesale regulated access with fiber local loop (NEBA Local): replicability of PSM commercial offers" | Group work | No Presential | 02:00 | 5% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |

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|----|--|-----------------|---------------|-------|----|--------|--|
| 11 | Case 9 "Real competition case: explanation of the market problem and case methodology" | Group work | No Presential | 02:00 | 5% | 5 / 10 | CG4 CG5 CG3 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
| 12 | Case 10 "Online platforms (network effects) and collaborative economy" | Group work | No Presential | 02:00 | 5% | 5 / 10 | CG5 CT1 CT2 CG3 CG4 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
| 13 | Case 11 "Application of Austrian School to regulation" | Group work | No Presential | 02:00 | 5% | 5 / 10 | CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
| 14 | Case 12 "Summary of the keypoints of guest lectures" | Individual work | No Presential | 02:00 | 5% | 5 / 10 | CG3 CG4 CG5 CG1 |

6.1.2. Final examination

| Week | Description | Modality | Type | Duration | Weight | Minimum grade | Evaluated skills |
|------|---|--------------|--------------|----------|--------|---------------|--|
| 17 | Final exam for non-continuous assessment students | Written test | Face-to-face | 01:30 | 50% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT4 |

| | | | | | | | |
|----|--|----------------------|--------------|-------|-----|--------|--|
| 17 | All the same cases of the course required for continuous assessment, including a final dissertation in the exam day. | Problem-solving test | Face-to-face | 30:00 | 50% | 5 / 10 | CG3 CG4 CG5 CT1 CT2 CT6 CG2 CE7 CG1 CT3 CT4 CT5 |
|----|--|----------------------|--------------|-------|-----|--------|--|

6.1.3. Referred (re-sit) examination

| Description | Modality | Type | Duration | Weight | Minimum grade | Evaluated skills |
|--|--------------|--------------|----------|--------|---------------|---|
| Final exam for all the students in the extraordinary exam (re-sit) | Written test | Face-to-face | 02:00 | 100% | 5 / 10 | CG3 CG4 CT1 CT6 CG2 CE7 CG1 CT4 CT5 |

6.2. Assessment criteria

Students will be qualified through continuous evaluation by default. According to the "Normativa de Evaluación del Aprendizaje de la Universidad Politécnica de Madrid" rules, students willing to resign to continuous evaluation must notify so to the coordinator by a specific Moodle activity **before the end of week 3 after course beginning**.

The evaluation will assess if students have acquired all the competences of the subject. Thus, evaluation through final assessment will be carried out considering all the evaluation techniques used in continuous evaluation (EX, ET, TG, etc.), and will be celebrated in the exam period approved by the "Junta de Escuela" for the current academic semester and year. Evaluation activities that assess learning outcomes that cannot be evaluated through a single exam can be carried out during the semester.

The extraordinary examination will be carried out following the extraordinary procedure.

Continuous assessment

Attendance is mandatory to be assessed in the continuous assessment mode (90% of the lectures). The case studies will be developed either individually or in two members groups seized upon the number of students enrolled, all depending on the different cases' scope.

1. The case studies must be solved and handed-in by the students before we discuss them in the lectures.
2. The case studies will be discussed in the lectures among all the students enrolled and the faculty. The presentations of the different case studies will be weighted a total of 10% of the total grade. Each student or group will be given the chance to present at least one of the case studies (depending on the number of groups).
3. Students are expected to engage in the course attending the lectures, expressing their points of view, etc.
4. Students should submit their deliverables in due dates. In case that some students are not able to deliver all their works by the due dates, they will be given the opportunity to deliver them before the final exam date but those will be graded as 5.0.

Final assessment

- Final written exam (50%).
- Delivery of all the case studies specified in the continuous assessment option the day before the final exam (50%). They will be presented and discussed with the faculty after the final exam.

Extraordinary assessment (re-sit)

It is based on a final exam (100%).

7. Teaching resources

7.1. Teaching resources for the subject

| Name | Type | Notes |
|--|--------------|--|
| Herrera González, F. Mitos sobre la regulación para la competencia. Aplicación de la teoría económica austriaca al mercado de las telecomunicaciones en España. INSTITUTO DE ESTUDIOS ECONOMICOS, 2012 | Bibliography | Basic course textbook. It should be read by every student as part of the final assessment. Available in PDF format as well as in paper edition in the ETSIT Library. |
| Colin Blackman and Lara Srivastava. Telecommunications Regulation Handbook Tenth Anniversary Edition. ITU Infodev, 2011 | Bibliography | http://www.infodev.org/infodev-files/resource/InfodevDocuments_1057.pdf |
| Infodev ICT Regulation Kit (World Bank) | Bibliography | http://www.ictregulationtoolkit.org/en/home |
| Massimo Motta. Competition Policy. Theory and Practice Cambridge University Press (2004). | Bibliography | |
| William J. Baumol , J. Gregory Sidak. Toward Competition in Local Telephony (AEI Studies in Telecommunications Deregulation). MIT Press, November 10, 1993. | Bibliography | |

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|---|---------------------|--|
| <p>Martin E. Cave, Sumit K. Majumdar, Ingo Vogelsang. Handbook of Telecommunications Economics, Vol. 1: Structure, Regulation and Competition. North Holland; 1st edition, 2002</p> | <p>Bibliography</p> | |
| <p>Sumit Kumar Majumdar, Ingo Vogelsang, Martin E. Cave. Handbook of Telecommunications Economics, Volume 2: Technology Evolution and the Internet. Emerald Group Publishing Limited (January 10, 2006)</p> | <p>Bibliography</p> | |
| <p>Alfred E. Kahn. The Economics of Regulation: Principles and Institutions. The MIT Press; 0002-Revised edition (June 22, 1988).</p> | <p>Bibliography</p> | |
| <p>Jean Tirole, Jean-Jacques Laffont. Competition in Telecommunications. Munich Lectures in Economics The MIT Press, March 1, 2001</p> | <p>Bibliography</p> | |
| <p>Bridger M. Mitchell, Ingo Vogelsang. Telecommunications Pricing: Theory and Practice. Cambridge University Press (November 29, 1991)</p> | <p>Bibliography</p> | |
| <p>Farid Gasmi, D. Mark Kennet, William W. Sharkey, Jean-Jacques Laffont. Cost Proxy Models and Telecommunications Policy: A New Empirical Approach to Regulation. The MIT Press; Har/Cdr edition (September 9, 2002)</p> | <p>Bibliography</p> | |

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|--|---------------------|--|
| <p>Martin Cave, William Webb. Spectrum Management: Using the Airwaves for Maximum Social and Economic Benefit Hardcover. Cambridge University Press, November 30, 2015</p> | <p>Bibliography</p> | |
| <p>W. Kip Viscusi, John M. Vernon, Joseph E. Harrington Jr. Economics of Regulation and Antitrust, 4th Edition. The MIT Press (August 19, 2005)</p> | <p>Bibliography</p> | |
| <p>Pérez J. (coordinado). Neutralidad de red: aportaciones al debate. Fundación Telefónica, 2011.</p> | <p>Bibliography</p> | <p>http://www.fundaciontelefonica.com/arte_cultura/publicaciones-listado/pagina-item-publicaciones/itempubli/84/</p> |
| <p>Journal Telecommunications Policy. Elsevier</p> | <p>Bibliography</p> | <p>http://www.journals.elsevier.com/telecommunications-policy/</p> |
| <p>Notas y apuntes de clase. Se irán suministrando durante el curso a través del servidor Moodle.</p> | <p>Bibliography</p> | |
| <p>Moodle de la asignatura</p> | <p>Web resource</p> | <p>It contains all the course material. It supports all the course interactions (forum, case publication and deliverable upload, etc).</p> |

8. Other information

8.1. Other information about the subject

Use of English and Spanish

This course is increasingly being updated to the English language, but it should be considered that an important part of the material and the bibliographic sources are in the Spanish language due to the fact that many aspects are related to the Spanish market and its regulation. Of course, this Spanish regulation is based on the European one, therefore the outcomes can be immediately applicable to any market.

Service Level for answering emails

Student's emails sent to the professors will be answered not later than 4 working days.