Universitat Autònoma de Barcelona

2019/2020

Estándares en E-health e Interoperabilidad

Código: 44020
Créditos ECTS: 6

Titulación	Tipo	Curso	Semestre
4316624 Internet de las Cosas para Salud Digital / Internet of Things for e-Health	OB	0	1

Contacto

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Uso de idiomas

Lengua vehicular mayoritaria: inglés (eng)

Otras observaciones sobre los idiomas

English-only course

Equipo docente

Carlos Borrego Iglesias

Prerequisitos

There are no formal prerequisites.

Objetivos y contextualización

The goal of this subject is to provide an introduction to standards, communication protocols and security protocols concerning Internet-of-Things for E-Health (IoT-eH). Successful students will aquire skills required to make informed decisions regarding the infrastructure of IoT-eH systems. Part of those skills involve researching the state of the art and comparing available options. Others will focus on properly conveying all relevant information regarding decisions made under serveral communicative circumstances.

Competencias

- Aplicar el funcionamiento y organización de Internet, las tecnologías y protocolos de comunicaciones y de redes de nueva generación en el ámbito de la salud y la sanidad.
- Aplicar la normativa y regulación local, autonómica, nacional e internacional en el ámbito del Internet de los Objetos en Salud.
- Aplicar las herramientas básicas de investigación en el ámbito del Internet de los Objetos en Salud.
- Aplicar las reglas éticas aplicables al sector de la salud.
- Identificar los procedimientos asistenciales del sistema sanitario y los factores para su transformación digital hacia un modelo más eficiente para profesionales y pacientes.
- 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.
- 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.

Resultados de aprendizaje

1. Analizar y evaluar los requisitos de las tecnologías y protocolos de comunicaciones.
2. Aplicar la normativa y regulación local, autonómica, nacional e internacional en el ámbito del Internet de los Objetos en Salud.
3. Aplicar las herramientas básicas de investigación en el ámbito del Internet de los Objetos en Salud.
4. Comprender los procedimientos asistenciales protocolarizados mediante procedimientos estándar del sistema sanitario y de salud.
5. Comprender los procesos de estandarización y de la certificación de productos.
6. Identificar los estándares que permiten acelerar la transformación digital hacia un modelo de relación más eficiente para profesionales y pacientes.
7. 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.
8. 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.
9. Utilizar los comités de ética correspondientes del sector sanitario para la aprobación de estudios, procedimientos y desarrollos.

Contenido

1. Emerging Trends in Electronic Health Care
2. E-health Standards Institutions
3. HL7: Electronic Health Information Systems
4. DICOM: Digital Imaging and Communications in Medicine
5. Communication standards: JPEG
6. Communication standards: JPEG-LS
7. Communication standards: JPEG2000
8. Digital Video Compression Standards
9. Communications standards: H.264
10. Standards for Privacy, Security and Safety
11. Building blocks for Information Security
12. Communication systems for IoT
13. Wireless networks
14. Opportunistic Networking

Metodología

The methodology of this course is designed to expose the students to some of the most important concepts in the area of IoT-eH.

Different learning formats will be used in the presential lectures, including:

- Analysis of the literature

- Discussion of practical cases
- Presentation and defense of decissions related to standards in IoT

Autonomous student work will be required before each session, including independent literature research and preparation of written submissions and oral presentations. Active participation in class will be required for all formats to enhance learning outcomes for all course participants. Positive interactions and contributions in class will be rewarded in the final course grades.

Actividades

Título	Horas	ECTS	Resultados de aprendizaje
Tipo: Dirigidas			
Presential sessions	30	1,2	1, 2, 3, 4, 5, 6, 7, 8, 9
Tipo: Supervisadas			
Presential supervised sessions	15	0,6	1, 2, 3, 4, 5, 6, 7, 8, 9
Tipo: Autónomas			
Homework: resolution of exercises, reading of journal papers or technical reports, preparation of sessions	35	1,4	1, 2, 3, 4, 5, 6, 7, 8, 9
Preparation of oral assignments	25	1	1, 2, 3, 4, 5, 6, 7, 8, 9
Preparation of written assignments	25	1	1, 2, 3, 4, 5, 6, 7, 8, 9
Study for synthesis test	15	0,6	1, 2, 3, 4, 5, 6, 7, 8, 9

Evaluación

Final course marks will be based on each student portfolio, and computed as follows:

- Active preparation and participation in sessions: 2 points.

  Students must be able to provide evidence of participation in presential lectures, e.g., by sharing aquired knowledge and participating in group discussions. Failure to provide such evidence (e.g., by not engaging in lecture activities) will result in a 0% score in this part and automatic failure of the course. A minimum of 50% in this part will be required to pass the course.

- Assignments: 6 points.

  Students will be given written and oral assignments that must be submitted/delivered before specific deadlines that will be made public in class. Scoring of this partwill be as follows:

  - Written documents: 3 points
  - Oral presentations: 3 points.

Failure to submit/deliver them will result in a 0% score in this part and automatic failure of the course. A minimum of 2 points is required for the written and for the oral parts separately. Correct usage of the English language is mandatory for both parts.

- Synthesis written test: 2 points.

  A final synthesis test will be given based on the contents discussed during the course sessions. A minimum score of 50% in this part is required to pass the course.

The minimum score for each part must be met in order to pass the course. Otherwise, a final score of 3 out of 10 will be assigned.

Notwithstanding other disciplinary measures deemed appropriate, and in accordance with the academic regulations in force, assessment activities will receive a zero whenever a student commits academic irregularities that may alter such assessment.Assessment activities graded in this way and by this procedure will not be re-assessable. If passing the assessment activity or activities in question is required to pass the subject, the awarding of a zero for disciplinary measures will also entail a direct fail for the subject, with no opportunity to re-assess this in the same academic year. Irregularities contemplated in this procedure include, among others:

- the total or partial copying of a practical exercise, report, or any other evaluation activity;
- allowing others to copy;
- presenting group work that has not been done entirely by the members of the group, if applicable
- presenting any materials prepared by a third party as one's own work, even if these materials are translations or adaptations, including work that is not original or exclusively that of the student;
- having communication devices (such as mobile phones, smart watches, etc.) accessible during theoretical-practical assessment tests (individual exams), when prohibited

An overall grade of 5 or higher is required to pass the subject. A "non-assessable" grade cannot be assigned to students who have participated in any of the individual partial tests or the final exam. No special treatment will be given to students who have completed the course in previous academic years. The grade in the Transcript of Records (ToR) will be the lowest value between 3.0 and the weighted average grade, in the event of irregularities having been committed for any assessment activity (and therefore re-assessment will not be possible).

It is important to bear in mind that no assessment activities will be permitted for any student at a different date or time to that established, unless for justified causes duly advised before the activity and with the lecturer's previous consent. In all other cases, if an activity has not been carried out, this cannot be re-assessed.

To consult the academic regulations approved by the Governing Council of the UAB, please follow this link: http://webs2002.uab.es/afers_academics/info_ac/0041.htm

Actividades de evaluación

Título	Peso	Horas	ECTS	Resultados de aprendizaje
Oral presentations	30%	1	0,04	1, 2, 3, 4, 5, 6, 7, 8, 9
Participation in class: preparation, contributions and discussion	20%	2	0,08	1, 2, 3, 4, 5, 6, 7, 8

Synthesis test	20%	1	0,04	1, 2, 3, 4, 5, 6, 7, 8, 9
Writen deliverables	30%	1	0,04	1, 2, 3, 4, 5, 6, 7, 8, 9

Bibliografía

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8. Höller, Jan, David Boyle, Stamatis Karnouskos, Stefan Avesand, Catherine Mulligan, and Vlasios Tsiatsis. *From machine-to-machine to the internet of things*. Cambridge: Academic Press, 2014.
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