Industry 4.0 Course Syllabus

General information:

The world is at the onset of the Fourth Industrial Revolution and this revolution is very much driven by the smarts in automating decision making and processes. Advancements in IT has resulted in immense improvements in computational power across nearly all electronic devices and enhanced capabilities in connecting the dots in an increasingly networked society. Digital platforms in the Cloud provides a perfect canvas for inventing new business models and for intelligent algorithms to analyse data and derive knowledge for operationalize use by cyber physical systems. This course provides a comprehensive coverage on, among others, the role of data, manufacturing systems, various Industry 4.0 technologies, applications and case studies. In particular, we also draw input from researchers and practitioners on what are the opportunities and challenges brought about by Industry 4.0, and how organisations and knowledge workers can be better prepared to reap the benefits of this latest revolution.

Pre-requisite

Nil. No prior technical background is required

Expected efforts

6-8 hours per week

Learning objectives

This course is designed to offer learners an introduction to Industry 4.0 (or the Industrial Internet), its applications in the business world. Learners will gain deep insights into how smartness is being harnessed from data and appreciate what needs to be done in order to overcome some of the challenges.

Learning outcomes

1. Understand the drivers and enablers of Industry 4.0
2. Appreciate the smartness in Smart Factories, Smart cities, smart products and smart services
3. Able to outline the various systems used in a manufacturing plant and their role in an Industry 4.0 world
4. Appreciate the power of Cloud Computing in a networked economy
5. Understand the opportunities, challenges brought about by Industry 4.0 and how organisations and individuals should prepare to reap the benefits
Learning content and pedagogy

There are altogether 6 modules in this course. Each module has multiple sections. Typically, for each module, there is an introductory video and then for each section, there is a series of videos, supplemented by suggested readings and quizzes.

Grading Policy

Quizzes are used throughout the course for assessment. All questions carry equal marks. The passing mark is 70% (out of max 100). There is no weekly deadline for the assessment components. If you want your effort to be graded, you just need to complete them by 11:30 p.m. Tuesday, 24th April 2018 (GMT/UTC).

Discussion

Students are expected to visit the discussion forum at least twice a week. Pre-populated discussion thread(s) on specific topics will appear in the discussion forum each week. Please observe Discussion Forum Etiquette Guidelines in all your discussions.

Course Schedule

The following table is the course schedule. Any new information will be posted in the Course Updates & News in the Home section.
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<thead>
<tr>
<th>Event</th>
<th>Content</th>
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| **Week 1**  
(Feb 27, 2018 at 00:00 UTC) | **Module 1: Introduction to Industry 4.0**  
1.1 The Various Industrial Revolutions  
1.2 Digitalisation and the Networked Economy  
1.3 Drivers, Enablers, Compelling Forces and Challenges for Industry 4.0  
1.4 The Journey so far: Developments in USA, Europe, China and other countries  
1.5 Comparison of Industry 4.0 Factory and Today's Factory  
1.6 Trends of Industrial Big Data and Predictive Analytics for Smart Business Transformation  
1.7 Summary |
| **Week 2**  
(Mar 06, 2018 at 00:00 UTC) | **Module 2: Road to Industry 4.0**  
2.1 Internet of Things (IoT) & Industrial Internet of Things (IIoT) & Internet of Services  
2.2 Smart Manufacturing  
2.3 Smart Devices and Products  
2.4 Smart Logistics  
2.5 Smart Cities  
2.6 Predictive Analytics  
2.7 Summary |
| **Week 3**  
(Mar 13, 2018 at 00:00 UTC) | **Module 3: Related Disciplines, System, Technologies for enabling Industry 4.0**  
3.1 Cyberphysical Systems  
3.2 Robotic Automation and Collaborative Robots  
3.3 Support System for Industry 4.0  
3.4 Mobile Computing  
3.5 Related Disciplines  
3.6 Cyber Security  
3.7 Summary |
| **Week 4**  
(Mar 20, 2018 at 00:00 UTC) | **Module 4: Role of data, information, knowledge and collaboration in future organizations**  
4.1 Resource-based view of a firm  
4.2 Data as a new resource for organizations  
4.3 Harnessing and sharing knowledge in organizations  
4.4 Cloud Computing Basics  
4.5 Cloud Computing and Industry 4.0  
4.7 Summary |
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<td>Module 5: Other Applications and Case Studies</td>
<td>5.1 Industry 4.0 laboratories</td>
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<td>5.2 IIoT case studies</td>
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<td>5.3 Case studies from HKPolyU students</td>
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<td>5.4 Summary</td>
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<td>Week 6</td>
<td>Module 6: Business issues in Industry 4.0</td>
<td>6.1 Opportunities and Challenges</td>
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<td>6.2 Future of Works and Skills for Workers in the Industry 4.0 Era</td>
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<td>6.3 Strategies for competing in an Industry 4.0 world</td>
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