



UNIVERSITAS INDONESIA  
 FACULTY OF ECONOMICS AND BUSINESS  
 DEPARTMENT OF ACCOUNTING  
 UNDERGRADUATE PROGRAM

SYLLABUS  
 Big Data and Cognitive Computing  
 (*Big Data dan Komputasi Kognitif*)  
 ECAU608303  
 EVEN SEMESTER 2018/2019

No.	Lecturer	E-mail
1	- Annisa M.Sc. - Tubagus Muhamad Yusuf Khudri S.E., M.T.I., CA.	annisa.feb.ui@gmail.com yusufkhudri@gmail.com

Subject Code	ECAU608303
Subject Title	Big Data and Cognitive Computing ( <i>Big Data dan Komputasi Kognitif</i> )
Credit Value	3 sks
Pre-requisite/ Co-requisite/ Exclusion	Statistics for Economics and Business
Role and Purposes	The course contributes to the achievement of students in the Faculty of Economics and Business learning goals by enabling students to apply technical competence in business field (LG7). It also contributes in enabling students to have good oral communication skill (LG5) and to possess some traits of professional skills (LG8)
Subject Learning Outcomes	Upon completion of the subject, student will be able to  Technical competence: in Information Technology <ol style="list-style-type: none"> <li>a) Explain the importance of analytics, how it is transforming the world today, and applying the concepts on the industries using real case studies</li> <li>b) Explain what is analytics, the various types of analytics, and how to apply it to improve efficiency by using sample records and working with sequence data</li> <li>c) Explain information cycle / flow from data source preparation to data visualization.</li> <li>d) Explain the concepts of data transformations and functions and data modeling.</li> <li>e) Explain the the principles and the methodology in the data science world.</li> <li>f) Experience with the analytical tools on the industries real case</li> </ol>

	<p>study.</p> <p>g) Read a statistics data file into modeler and define data characteristics and review and explore data to look at data distributions and to identify data problems, including missing values.</p> <p>h) Use the automated data prep node to further prepare data for modeling and a partition node to create training and testing data subset</p> <p>Communication skills</p> <p>i) Communicate clearly and concisely in presentation and discussion</p> <p>Students are expected to be able to display interpersonal skills</p> <p>j) display cooperation and teamwork when working towards team goals</p> <p>k) apply active listening</p> <p>l) present ideas and influence others to provide support and commitment</p> <p>Students are expected to be able to display personal skills</p> <p>m) demonstrate commitment to lifelong learning</p> <p>n) able to manage time to achieve personal and group commitments</p> <p>Students are expected to be able to display organizational skills</p> <p>o) Review own works and that of others to determine whether it complies with class' quality standards</p> <p>p) Apply leadership skills to influence others to work towards team's goal</p>
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Subject Synopsis/ Indicative Syllabus	Week #	Topic	LO	Metode	Resources required	References
	1	<b>Module 1 : Business and technology</b> Overview on Big data and Cognitive Computing	a, j, l	Lecture for Overview on the class mechanism for the whole semester  Make groups of 4-5 students each. Group for big and	Mahasiswa perlu membawa laptop.  Perlu buku nilai untuk kelas	<a href="http://www.cognitivedevclass.ai">www.cognitivedevclass.ai</a>  <a href="https://onthehub.com/ibm">https://onthehub.com/ibm</a>  <a href="https://cloud.ibm.com">https://cloud.ibm.com</a>  <a href="https://www.kaggle.com">https://www.kaggle.com</a>

				<p>small project</p> <p>Registration to IBM Cloud for each of student</p> <p>Introduction to Big Data and Cognitive Computing</p>		<u>m/datasets</u>
2	<p><b>Module 1 :</b></p> <p><b>Business and technology</b></p> <p>Overview on Data Sources</p>	a, j, l	<p>Lecture give overview</p> <p>10 students for 2'-3' sharing about they learnt today</p>	<p>Perlu absen untuk mencatat check-mark siapa yang sdh tampil</p>		
3	<p><b>Module 2 :</b></p> <p><b>Analytics in real World</b></p> <ul style="list-style-type: none"> <li>Real World events and Characteristic --- include big Data</li> </ul>	a, b, j, l	<p>Lecture for Analytics in real world by showing the cases, why it happened and prediction of the future</p> <p>Group discussion to define the big project cases</p> <p>10' each for group presentation about the case</p>	<p>Layout Kelas Kelompok. Perlu membawa laptop. Memakai internet. Satu tim fasilitator guidance pertanyaan (if needed). Flipchart Layout</p>	<p>Student should prepare the data will be used for the big project for next week</p>	

				- Biz problem		
	4	<b>Module 2 : Analytics in real World (cont.)</b> <ul style="list-style-type: none"> <li>Data and Information - -- include data mining, data processing for report and analytics</li> </ul>	c,d, j,l	Lecture for Data and Information  Demo or White boarding  Start to access bluemix with applying prepared data  10 students for 2'-3' sharing about they learnt today	Layout Kelas Kelompok. Perlu membawa laptop. Memakai internet. Satu tim fasilitator guidance pertanyaan (if needed).  Student should continue prepare the data will be used for the big	

					project	
	5	<b>Module 2 : Analytics in real World (cont.)</b>  Data Science Methodology Overview	c, j, l	Lecture on the overview of DS Methodology  Group discussion  Finalizing the big project with the current data available and the agreed approach on the case - Biz problem - Analytics Approach - Data Collections	Kelompok. Perlu membawa laptop. Memakai internet. Satu tim fasilitator. Guidance pertanyaan.  Flipchart Layout	
	6	<b>Module 2 : Analytics in real World (cont.)</b> <ul style="list-style-type: none"> <li>• Conceptual Business Model --- include Industry Data Warehouse schema and how it is connected from sources up to report/ analytics view for the biz users</li> <li>• Real World Organization - - include data</li> </ul>	a, c, j, l	Lecture for Conceptual Business Model and Data governance  Demo  10 students for 2'-3' sharing about they learnt today	Student should prepare the data will be used for the big project  Flipchart Layout	Student prepare for group presentation

		governance				
7	<b>Module 2 : Analytics in real World (cont.)</b> <ul style="list-style-type: none"> <li>Real case for Campaign (example) – how the data will be used and give the benefit for the company</li> </ul>	a, c, h, i, j, k, l, m, n, o	Lecture for one of the case the data usage for business  Group presentation 15' each on the case - Biz problem - Analytics Approach - Data Collections - Data Understanding	Kelompok. Perlu membawa laptop. Memakai internet.	<a href="http://www.kaggle.com/datasets">Www.kaggle.com/datasets</a> Data Susenas  Student should prepare the data will be used for the big project	
	<ul style="list-style-type: none"> <li><b>MID EXAM</b></li> </ul>		Essay Tertulis	Individu		
8	<b>Module 3 : Analytics Tools</b> <ul style="list-style-type: none"> <li>Business Intelligence -- play around with BI tools</li> </ul>	e, j, l, m	Lecture on BI Tools and Planning and Budgeting  Lecture Demo or Hands on Demo  10 students for 2'-3' sharing about they learnt today	BI tools dari IBM Cognos dan TM1 Laptop		
9	<b>Module 3 : Analytics Tools (cont.)</b>	e, f, j, l, m	Lecture on Predictive and	Laptop mahasiswa	<a href="https://www.youtube.com/">https://www.youtube.c</a>	

		<ul style="list-style-type: none"> <li>Predictive Analytics</li> <li>Prescriptive Analytics -- play around with SPSS modeler or DSX</li> </ul>	<p>Prescriptive Analytics.</p> <p>Lecture on Analytical tools (SPPS or DSX)</p> <p>Group or small group activity: Student experience and familiarized with the tools using project data</p> <p>10 students for 2'-3' sharing about they learnt today</p>		<a href="https://www.youtube.com/watch?v=e4CwGbuO624">om/watch?v=e4CwGbuO624</a>
	10	<p><b>Module 3 : Analytics Tools (cont.)</b></p> <ul style="list-style-type: none"> <li>Case</li> </ul>	<p>Finalizing the big project with the current data available and the agreed approach on the case</p> <ul style="list-style-type: none"> <li>- Biz problem</li> <li>- Analytics Approach</li> <li>- Data Collections</li> <li>- data Preparation</li> </ul>	Tim fasilitator	

				<ul style="list-style-type: none"> <li>- Data modelling</li> <li>- Evaluation/ Summary</li> </ul> <p>Group presentation 15' each on</p> <ul style="list-style-type: none"> <li>- What have been done</li> <li>- Issues founds and how or planned to solved the issues</li> <li>- Lesson learnt</li> </ul>		
	11	<b>Module 3 : Analytics Tools (cont.)</b> Machine Learning -- only machine learning presentation sessions,	g, j, l, m	Lecture about Machine Learning  Demo on IBM Watson Machine Learning.  Group or small group activity: Students experience and familiarize with Machine Learning engine  10 students	Tools dapat diakses internet dari rumah.  IBM Watson Machine Learning.	



				for 2'-3' sharing about they learnt		
12	<b>Module 3 : Analytics Tools (cont.)</b> <ul style="list-style-type: none"> <li>Cognitive -- play around with Watson Assistant</li> </ul>	g, j, l, m	Lecture about Cognitive Computing  Demo on IBM cognitive asset  Overview on the services available on IBM Cloud  Group or small group activity: Students experience and familiarize with Machine Learning engine 10 students f  or 2'-3' sharing about they learnt	Tools dapat diakses internet dari rumah.		
13	<b>Module 3 : Analytics Tools (cont.)</b> Cognitive -- play around with Watson Assistant		Build a simple Chat Bot  Lecture give the case (SelfService FE UI Student -Robo)	Flip Chart  Group laptop		

				<p>Lecture leads discussion on possible sub – cases (use persona)</p> <p>Lecture splits sub cases handler to groups</p> <p>60' (parallel) Group small Project Chat Bot building.</p> <p>5' Group chat-bot demo</p>		
14	<ul style="list-style-type: none"> <li>• Presentation – Project Batch 1</li> </ul>	h, i, j, k, l, m, n, o	<p>20' Group presentation on the case</p> <ul style="list-style-type: none"> <li>- Biz problem</li> <li>- Analytics Approach</li> <li>- Data Collections</li> <li>- data Preparation</li> <li>- Data modelling</li> <li>- Evaluation/ Summary</li> </ul>			
15	Presentation – Project Batch 2	h, i, j, k, l, m, n, o	<p>20' Group presentation on the case</p> <ul style="list-style-type: none"> <li>- Biz problem</li> <li>- Analytics Approach</li> </ul>			

					- Data Collections																		
					- data Preparation																		
					- Data modelling																		
					- Evaluation/ Summary																		
Teaching/Learning Methodology	This course will use lecturing for sessions 1-5 and 7, problem based learning for session 6 and experiential learning for sessions 8-14.																						
Assessment Method in Alignment with Intended Learning Outcomes	Assessment		% weight	Intended Learning Outcomes to be assessed																			
				A	b	c	d	e	f	g	h	i	j										
	<b>Group</b>		40%	T L A																			
	Group Case Presentation		40%																				
	<b>Individual</b>		<b>60%</b>																				
	Mid Exam (closed book)		35%																				
	Personal Contribution		10%																				
	Presence		5%																				
Individual Contribution (peer assessment)		10%																					
Student Study Effort Expected	<table border="1"> <tr> <td><b>Class Contacts</b></td> <td></td> </tr> <tr> <td>Lectures</td> <td>27,5 Hours</td> </tr> <tr> <td>Group Discussion</td> <td>4 Hours</td> </tr> <tr> <td>Presentation &amp; Class Discussion</td> <td>7,5 Hours</td> </tr> <tr> <td><b>Sub Total</b></td> <td><b>35 Hours</b></td> </tr> <tr> <td><b>Other student study effort</b></td> <td></td> </tr> <tr> <td>Preparation for discussion</td> <td>14 Hours</td> </tr> <tr> <td>Independent Study</td> <td>28 Hours</td> </tr> </table>													<b>Class Contacts</b>		Lectures	27,5 Hours	Group Discussion	4 Hours	Presentation & Class Discussion	7,5 Hours	<b>Sub Total</b>	<b>35 Hours</b>
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	<b>Total</b>	<b>78 Hours</b>
Reading List and References	<p>Any books related to Big Data, Big Data Analytics, Machine Learning, Cognitive, Data Science for Business</p> <p><a href="https://www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-big-data-at-work.html">https://www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-big-data-at-work.html</a></p> <p><a href="https://www-935.ibm.com/services/us/gbs/thoughtleadership/2016analytics/">https://www-935.ibm.com/services/us/gbs/thoughtleadership/2016analytics/</a></p> <p><a href="https://www-935.ibm.com/services/us/gbs/thoughtleadership/2015analytics/">https://www-935.ibm.com/services/us/gbs/thoughtleadership/2015analytics/</a></p> <p><a href="https://www-935.ibm.com/services/us/gbs/thoughtleadership/2014analytics/">https://www-935.ibm.com/services/us/gbs/thoughtleadership/2014analytics/</a></p> <p><a href="https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=WH&amp;infotype=SA&amp;htmlfid=YTL03380USEN&amp;attachment=YTL03380USEN.PDF">https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=WH&amp;infotype=SA&amp;htmlfid=YTL03380USEN&amp;attachment=YTL03380USEN.PDF</a></p> <p><a href="https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=IML14569USEN&amp;">https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=IML14569USEN&amp;</a></p> <p><a href="https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=IML14575USEN&amp;">https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=IML14575USEN&amp;</a></p> <p><a href="https://www-935.ibm.com/services/us/gbs/thoughtleadership/ninelevers/">https://www-935.ibm.com/services/us/gbs/thoughtleadership/ninelevers/</a></p> <p><a href="https://www-935.ibm.com/services/us/gbs/thoughtleadership/yieldofdreams/">https://www-935.ibm.com/services/us/gbs/thoughtleadership/yieldofdreams/</a></p>	

## Panduan Group Project (40%)

1. Tugas ini dilaksanakan secara berkelompok.
2. Setiap kelompok menyiapkan dalam bentuk presentasi dan paper dengan komponen di bawah ini:
  - a. Business problem dan konsep yang melatarbelakangi penyelesaian business problem tersebut.
  - b. Pendekatan analytics yang digunakan untuk menyelesaikan business problem tersebut.
  - c. Penjelasan jenis dan dimensi dari data yang akan digunakan dan strategi pengumpulan data tersebut.
  - d. Penjelasan mengenai persiapan data sebelum digunakan dalam data modelling.
  - e. Proses pemodelan data. Mahasiswa tidak dibatasi dalam menggunakan aplikasi/software tertentu untuk dapat melakukan pemodelan data ini.
  - f. Mahasiswa dapat menggunakan chatbot namun hanya sebagai tambahan.
  - g. Mahasiswa menyiapkan kesimpulan atas penyelesaian business problem dan dari keseluruhan proses yang telah dilakukan pada project ini.
3. Presentasi kelompok dapat menggunakan .ppt sebagai media pembantu dan presentasi dilaksanakan maksimal 15 menit per kelompok. Slide presentasi wajib disubmit ke SCELE sebelum H-1 jadwal presentasi kelompok dalam bentuk .pdf.
4. Jumlah halaman pada paper tidak dibatasi namun mahasiswa harus mengaplikasikan kaidah penulisan ilmiah yang sudah dipelajari pada mata kuliah penulisan ilmiah sebelumnya. Paper dikumpulkan pada saat jadwal ujian akhir melalui SCELE dengan format .pdf.