

COURSE INFORMATION

1.	Name of Course													Data I							
2 .	Course Code													TDS3							
3 .	Type of Course (e.g. : Core, major, elective etc.)										Specialisation Core for BCS [DS] and elective for all other specializations										
4 .	Synopsis											This course aims to develop individuals with skills in exploring huge amount of data to discover out of box patterns and hidden knowledge. The topics cover various state-of-art algorithms for data mining and also evaluation methods to assess the quality of the results yieled using the algorithms.									
5 .													Curre Previo								
6.														Ting (Choo `	∕ee, ⊦	lo Chi	n Kuan, Foo Lee I	Kien, Chua Sook L	ing @ Linda Chua, Khor	
7.	Semester and Year Offered													Trime	ster 1	(Delta	a)				
<u>8.</u> 9.														4 TCP1101 Programming Fundamentals							
														data p	repar				s, classification me	ethods and cluster	
11 .	Justification for including to prepare students with the	the co	ourse	in the	progr	amme	· e:									ıta mir	ning so	olution.			
40	Course Learning Outcome	- (CL (0/													-	omai	_	I	Level	
12 .	CLO1: Describe the data			cess a	and ap	plication	ons of	data n	nining								ognitiv			2	
	,							improve the quality of data						Cognitive						3	
	CLO3: Apply appropriate CLO4: Evaluate data mi			y meth	ious to	uisco	ver us	seiui patterns						Cognitive					3		
13 .	Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Te.										, Teac	hing	Cognitive 4 Methods and Assessment:								
	Course Learning			Pro	ogram	me L	<u>earni</u> n	g Out	come	s (PL	0)				Т	eachi	ng Me	ethods	Asses	sment Method	
	Outcomes (CLO) (Must tally with CLOs in item 12)	P	P	Р	P	Р	Р.	P	Р.	Р.	PL	P L	PL								
		0 1	L 0 2	L 0 3	L O 4	L O 5	L O 6	L O 7	L 0 8	L O 9	0 1 0	0 1 1	0 1 2								
	CLO1							✓		✓					re, Pra				Test	T	
	CLO2 CLO3			-		-				·		-		Lectu					Assignment, Lab Assignment, Test	Test, Final Exam	
	CLO4									✓				Lecture, Practical Lecture, Practical					Assignment		
	Total							1		3				Indicate the relevancy between the CLO and P (This description must be read together with st pages 16 & 18 of COPPA 2.0)							
14 .	Transferable Skills: Critical Thinking - developed	via ex	kplorin	g data	in ass	ignme	ent and	d repor	rt writii	ng - as	ssess	ed via	pres	entatio	n and	repor	t writir	ng. Research - dev	veloped via empiri	cal studies in assignment.	
15 .	Distribution of Student Lea	rning	Time	(SLT)																
	Course Content Outline							**CLO				Teaching and Learning Activities Guided Guided Learning (F2F)* (NF2F)*				Learning	Independent Learning (NF2F)*	Total SLT			
														*L	*T	*P	*0				
	Introduction Data mining concepts - 1 motivated data mining, Types of data repositor performed; Data mining	why is ries or	s data n which	mining n data	g impo mining	rtant; g can b				1				2		2			4	8	
	Data Preprocessing Data cleaning – handling missing values and noisy data; Data integration – correlation analysis; Data transformation - normalization; Data reduction – attribute subset selection, dimensionality reduction, numerosity reduction												8		2		12	10	32		
	Association Rule Mining Market basket analysis; Mining frequent itemsets; Method for mining frequent patterns – the Apriori algorithm; Generating association rules; Evaluation of association rules								3,4					4		4			8	16	
	Classification Classification in data mining and example; Classification methods - decision tree learning, naïve Bayes classifier and artificial neural networks; Metrics for evaluating classifier performance; Evaluating the accuracy of a classifier								3,4				8		8			16	32		

Clustering Clustering in data mining: Types of data in cluster analysis; 5 Measures of proximity, Clustering methods - k-means and hierarchical methods: Clustering example; Cluster evaluation and validation; outlier analysis Applications and Trends in Data Mining Data mining applications - financial, retail, 6 telecommunication, biological data analysis, intrusion detection; Data mining tools, Phravay and social impacts of data mining; Trends in data mining SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test Down Total SLT Test Down Total SLT Test Down Total SLT Test Down Total SLT Total SLT Test Down Total SLT Total SLT Total SLT Firal Assessment Percentage % Total SLT Total SLT Firal Exam Total SLT for Continuous Assessment Percentage % Total SLT Total SLT Firal Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total "Indicate the CLO based on the CLO's numbering in Item 12. "Le Lecture, "Te Tutorial, "Pe Practical, "Oe Others, F2F" = Race to Face, NF2F" = Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Jadiditional References: Jadi	Clustering in data mining: Types of data in cluster analysis; Measures of proximity. Clustering methods - k-means and hierarchical methods; Clustering exhample; Cluster evaluation and validation; outlier analysis Applications and Trends in Data Mining Data mining applications – financial, retail. 6 telecommunication, biological data analysis, intrusion detection; Data mining objects; Privacy and social impacts of data mining; Trends in data mining Total SLT 112 SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage Total SLT 20% 5 Lab Test 20% 5 Lab Test 20% 5 Lab Test 20% 5 Assignments 30% 16 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage Total SLT Total SLT Total SLT Total SLT Total SLT Total SLT Final Exam 40% 2 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total Total CLO based on the CLO's numbering in Item 12. "Le Lecture, "T = Tutorial, "P = Practical, "O = Others, F2F" = Face to Face, NF2F" = Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Elbe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	Clustering in data mining: Types of data in cluster analysis: 5 Measures of proximity: Clustering methods - k-means and hierarchical methods: Clustering example; Cluster evaluation and validation; outlier analysis Applications and Trends in Data Mining Data mining applications – financial, retail, 6 telecommunication, biological data analysis, intrusion detection; Data mining pools; Privacy and social impacts of data mining; Trends in data mining Total SLT 112 SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test 20% 5 Lab Test 20% 5 Assignments 10% 5 Assignments 20% 5 2. Final Assessment Percentage % Total SLT Final Exam 40% 5 Total SLT for Continuous Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 1600													
Data mining applications – financial, retail, 6 telecommunication, biological data analysis, intrusion detection; Data mining tools; Privacy and social impacts of data mining; Trends in data mining SUMMATIVE ASSESSMENT 1. Continuous Assessment SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test 20% 5 Lab Test 10% 5 Assignments Total SLT for Continuous Assessment Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Total SLT for Continuous Assessment Total SLT for Final Assessment 26 Total SLT for Final Assessment Fercentage % Total SLT Total SLT Final Exam Total SLT for Final Assessment Fercentage % Total SLT Total SLT Final Exam Total SLT for Final Assessment Fercentage % Total SLT Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total "Indicate the CLO based on the CLO's numbering in Item 12. "L= Lecture, "T= Tutorial, "P= Practical, "O= Others, F2F"= Face to Face, NF2F"= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Elbe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References: Ian Witten, Elbe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	Data mining applications – financial, retail, 6 telecommunication, biological data analysis, intrusion detection; Data mining tools; Privacy and social impacts of data mining; Trends in data mining Total SLT 112	Data mining applications – financial, retail, 6 telecommunication, biological data analysis, intrusion detection; Data mining tools; Privacy and social impacts of data mining: Trends in data mining Total SLT 1112 SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test 20% 5 Lab Test 20% 5 Assignments 10% 5 Assignments 26 2. Final Assessment Percentage % Total SLT Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Total SLT for Final Assessment 26 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 5 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 Which is the CLO based on the CLO's numbering in Item 12. "Le Lecture, "T= Tutorial, "P= Practical, "O= Others, F2F"= Face to Face, NF2F"= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	Clustering in data mining; Types of data in cluster analysis; Measures of proximity; Clustering methods - k-means and hierarchical methods; Clustering example; Cluster	3,4	4		4			8	16				
SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test 20% 5 Lab Test 10% 5 Assignments 16 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test 20% 5 Lab Test 10% 5 Assignments 7 Total SLT for Continuous Assessment Percentage % Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	SUMMATIVE ASSESSMENT 1. Continuous Assessment 2. Example 10% 2. Final Assessment 3. Continuous Assessment 4. Continuous Assessment 5. Continuous Assessment 6. Continuous Assessment 7. Continuous Assessment 8. Continuous Assessment 9. Continu	Data mining applications – financial, retail, 6 telecommunication, biological data analysis, intrusion detection; Data mining tools; Privacy and social impacts of	1	2		2			4	8				
SUMMATIVE ASSESSMENT 1. Continuous Assessment Test 20% 5 Lab Test 10% 5 Assignments 10% 5 Assignments 10% 16 Total SLT for Continuous Assessment 26 2. Final Assessment Final Exam Percentage % Total SLT Final Exam 10% 100% 100 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, "T= Tutorial, "P= Practical, "O= Others, F2F"= Face to Face, NF2F"= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	SUMMATIVE ASSESSMENT 1. Continuous Assessment Percentage % Total SLT Test 20% 5 Lab Test 10% 5 Assignments Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	SUMMATIVE ASSESSMENT 1. Continuous Assessment 1. Continuous Assessment 1. Continuous Assessment 2. Continuous Assessment 2. Example 10% 2. Final Assessment 2. Final Assessment 2. Final Exam 2. Final Exam 3. Continuous Assessment 4. Continuou								Total SLT	112				
Continuous Assessment	1. Continuous Assessment	Total SLT													
Continuous Assessment	1. Continuous Assessment	Total SLT		SUMMATIVE ASSE	SSMEN	IT									
Test 20% 5 Lab Test 10% 5 Assignments 30% 16 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Test 20% 5 Lab Test 10% 5 Assignments 30% 16 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Test 20% 5 Lab Test 10% 5 Assignments 30% 16 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Grand Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F* = Face to Face, NF2F* = Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	1. Continuous Assessment				Perc	centac	ae %	Т	otal SLT				
Lab Test 10% 5 Assignments 26 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. **Le Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Lab Test 10% 5 Assignments 26 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. **L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Lab Test 10% 5 Assignments 26 Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. **L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F* = Face to Face, NF2F* = Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.													
Assignments Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam Total SLT for Final Assessment Percentage % Total SLT Final Exam Total SLT for Final Assessment F2F ILT Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total *Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: In Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Assignments Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam Percentage % Total SLT F2F ILT F1 F2F ILT F1 F1 F2F F1 F2F F1 F2F F1 F2 F2 F1 F2 F2 F1 F2 F2 F1 F2 F2 F1	Assignments Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam	I sh Test			10%									
Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam Percentage % Total SLT Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total *Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Total SLT for Continuous Assessment 26 2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:													
2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face I Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. **L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	Assignments 30% 16												
2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face I Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	2. Final Assessment Percentage % Total SLT Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. **L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers.	Tatal CIT for Continuous Accessment												
2. Final Assessment Final Exam 40% 2 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. **Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: In Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, "T= Tutorial, "P= Practical, "O= Others, F2F"= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:			I Utai	JLI I	01 00	Humu	ous Assessment		20				
2. Final Assessment Final Exam 40% 2 22 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. **Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibee Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, "T= Tutorial, "P= Practical, "O= Others, F2F"= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:		Total SLT											
Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F'= Face to Face, NF2F'= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Final Exam 40% 2 20 Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Final Exam Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	2. Final Assessment				Perd	centag	ge %						
Total SLT for Final Assessment (F2F + NF2F) Grand Total *Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Total SLT for Final Assessment (F2F + NF2F) Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. **L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Total SLT for Final Assessment (F2F + NF2F) 22 Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. **L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Final Exam				40%								
Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. *Le Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: In Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Grand Total **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Grand Total 100% 160 **Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	I III LAUII	Total	SI T fo	r Eins	J Acc		ont (ESE + NESE)						
**Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	**Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	**Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:		Total	JET 10	/1 1 IIIC	11 A33	500 111	CIIC (I ZI T NEZE)		- -				
**Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	**Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	**Indicate the CLO based on the CLO's numbering in Item 12. *L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Grand Total					100%			160				
*L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	*L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	*L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:													
Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room): Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:			Food										
Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	L= Lecture, T= Tutoriai, F= Fracticai, O= Others, F2F = Fa	ce to race, NFZF = Non race to	гасе										
Computer lab Main References: Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Computer lab Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:													
. Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	Main References: lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:		re, nursery, computer lab, simula	tion ro	om):									
lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:	lan Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practical Machine Learning Tools and Techniques (4th Edition), Morgan Kaufmann Publishers. Additional References:													
Additional References:	Additional References:	Additional References:													
			Ian Witten, Eibe Frank and Mark Hall (2016). Data Mining: Practic	al Machine Learning Tools and T	echniqu	ıes (4t	h Editi	ion), N	Norgan Kaufmann I	oublishers.					
Jiawei Han, Micheline Kamber and Jian Pei (2012). Data Mining: Concepts and Techniques (3rd Edition), Morgan Kaufmann Publishers	Jiawei Han, Micheline Kamber and Jian Pei (2012). Data Mining: Concepts and Techniques (3rd Edition), Morgan Kaufmann Publishers	Jiawei Han, Micheline Kamber and Jian Pei (2012). Data Mining: Concepts and Techniques (3rd Edition), Morgan Kaufmann Publishers													
			Jiawei Han, Micheline Kamber and Jian Pei (2012). Data Mining:	Concepts and Techniques (3rd E	dition), N	Morga	n Kau	fmann	Publishers						

Cells shaded light grey contain formulas / fixed values. Edit these formulas only if needed.