		Specification table						
		code: 328059-M3 (fall, block 3) and 328062-M3 (spring, block 1) name: Data Preparation & Workflow Management Test Type: Take-home computer exam (50%), open and closed questions						
		Cognitive skills						
		Tested with MC & open questions (randomized, personalized, and cannot go back and forth between subsequent questions)			**Tested with open questions (personalized, can freely go back between questions)**			
	Tested subjects (corresponding learning goal*). student are able to	Knowledge	Comprehension	Analysis	Application	Evaluation	Synthesis	Number of questions/ percentage score points per learning goal
1	Use GitHub for managing empirical research projects (e.g., GitHub Issues and Project Boards)	x	x	x		x		15%
2	Use Git/GitHub for versioning files and collaborating on privately-shared and publicly-available (open science) GitHub repositories	x	x	x	x	x		15%
3	Use R to clean and transform data for analysis (e.g., aggregation, merging, de-duplication, reshaping, data conversions, regular expressions)	x	x	x	x	x	x	20%
4	Use R for generating automatic reports (e.g., to assess data quality, to report research findings in a paper) and deploying research findings in novel ways (e.g., apps)	x	x	x	x	x		25%
5	Use Workflow Management Tools to create and run portable, automated, and reproducible data pipelines	x	x	x	x		x	25%
6	Track, evaluate and share your progress on the course's learning goals							0%
	Number of questions/ percentage score points per thinking skill	7,5%	7,5%	10%	40%	10%	25%	100%

		Specification table						
		code:	328059-M3 (fall, block 3) and 328062-M3 (spring, block 1)					
		name:	Data Preparation & Workflow Management					
		Test Type:	Team assignment (45%; 10% individual component assessed via self- and peer asse					
		Cognitive skills						
	Tested subjects (corresponding learning goal*)	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis	Number of questions/ percentage score points per learning goal
1	Use GitHub for managing empirical research projects (e.g., GitHub Issues and Project Boards)			10%				10%
2	Use Git/GitHub for versioning files and collaborating on privately-available (open science) GitHub repositories			10%		10%		20%
3	Use R to clean and transform data for analysis (e.g., aggregation, merging, de-duplication, reshaping, data conversions, regular expressions)		10%		20%			30%
4	Use R for generating automatic reports (e.g., to assess data quality, to report research findings in a paper) and deploying research findings in novel ways (e.g., apps)				15%		15%	30%
5	Use Workflow Management Tools to create and run portable, automated, and reproducible data pipelines						10%	10%
6	Track, evaluate and share your progress on the course's learning goals							0%
	Number of questions/ percentage score points per thinking skill	0%	10%	20%	35%	10%	25%	100%

		Specification table						
		code:	328059-M3 (fall, block 3) and 328062-M3 (spring, block 1)					
		name:	Data Preparation & Workflow Management					
		Test Type:	Pulse (5%; based on weekly activity)					
		Cognitive skills						
	Tested subjects (corresponding learning goal*). student are able to	Knowledge	Comprehension	Analysis	Application	Evaluation	Synthesis	Number of questions/ percentage score points per learning goal
1	Use GitHub for managing empirical research projects (e.g., GitHub Issues and Project Boards)							0%
2	Use Git/GitHub for versioning files and collaborating on privately-shared and publicly-available (open science) GitHub repositories							0%
3	Use R to clean and transform data for analysis (e.g., aggregation, merging, de-duplication, reshaping, data conversions, regular expressions)							0%
4	Use R for generating automatic reports (e.g., to assess data quality, to report research findings in a paper) and deploying research findings in novel ways (e.g., apps)							0%
5	Use Workflow Management Tools to create and run portable, automated, and reproducible data pipelines							0%
6	Track, evaluate and share your progress on the course's learning goals					100%		100%
	Number of questions/ percentage score points per thinking skill	0,0%	0,0%	0,0%	0,0%	100,0%	0,0%	100%

Cognitive skill	*Explanation*	*Verbs*
Knowledge	Students should be able to remember information and reproduce it.	Name, mention, summarize, recall, reproduce, define, describe
Comprehension	Students have to interpret the study material and give account of it in their own words.	Prove, demonstrate, identify, interpet, explain, clarify, justify
Application	Students use the taught material "plug and play" in a new situation. (In case application in a practical situation goes beyond "plug and play" it is a combination of analysis and evaluation.)	Illustrate, use, assess, construct, apply, calculate, determine
Analysis	Students analyze and break up the study material and then relate the various pieces to each other.	Compare, analyze, relate, prove, split, discriminate, distinguish
Evaluation	Students give reasoned judgments of information on the basis of internal and external criteria, principles and ideas.	Comment on, evaluate, review, interpret, give opinion, argue, reason
Synthesis/ Creation	Students bring components together to create something new/unique. (For example different theories, concepts, disciplines, models, or studies.)	Deduce from, conclude, design, draw, devise, put together, unravel