INF

FAKULTÄT FÜR
INFORMATIK

PPSW – Soft Skills

Study Skills

Agenda

Basic Information you need to know

What is study success?

How to study successfully

Tipps and Tricks

Masters Degrees

What is a Masters Degree?

- Secondary or advanced degree (after Bachelor)
- International norm
- Since 2010 standard also in Europe
- Three or four Semesters (90 / 120 Credit Points)
- Higher degree of specialization
- Qualifies for starting a PhD

Masters Degrees at FIN

From the Masters study regulations:

§ 2 Programme objective

The objective of the programme is for students to acquire a broad but simultaneously detailed and critical understanding of the subject as well as the ability to work independently in accordance with scientific methods, to familiarize themselves independently with fields of activity relating to practice, research and teaching and to deal with the frequently changing array of tasks in the working life.

The Master's degree course supplements the content of the preceding Bachelor's degree course and, in terms of quality, considerably exceeds it.

Doctorate

What is that?

- Ones own research on an academic level
- Papers and a doctoral thesis
- Duration: 2.5 to 6 years

How to get a doctorate

- Through being a research and teaching assistant
- With a scholarship
- Part-time or spare-time

A Doctorate is one prerequisite for …

- A professorship at a technical college or university
- Leading positions in research institutions

Study facts

The studies are planned with 30 CP per semester

- This corresponds to 900 hours of work for students

900 hours correspond to 22.5 40h-weeks

- This would be 45 work weeks per year

This work occurs during lecture and exam time

- Which is only 18 / 36 weeks

Result: The weekly workload of a student is

- $900/18 = 50$ hours

That is what the university is expecting from you!

Study facts

A typical Master module at FIN has 6 CP

- Which corresponds to a workload of 180 h

A typical distribution of these 180 h:

- 14 x 2h = 28h for lectures
- 14 x 2h = 28h for exercises
- 14 x 2h = 28h prepare and follow-up on lectures
- 14 x 4h = 56h homework / project work
- 180h – 14x10h= 40h exam preparation

The normal duration of exam preparation is therefore …

- 1 whole work week

Modules

A study course is made up of modules

What is a module?

- A related group of courses
- That is tested (mostly at the end)

Modules at FIN:

- A module almost always corresponds to a course
- Standard scope in Masters = 6 CP

Every module is specified by a module description

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Module descriptions

Modulbezeichnung:	Applied Discrete Modelling
engl. Modulbezeichnung:	Applied Discrete Modelling
ggf. Modulniveau:	
Kürzel:	ADM
ggf. Untertitel:	
ggf. Lehrveranstaltungen:	
Studiensemester:	B.Sc. ab 1. Semester; M.Sc. ab 1. Semester
Modulverantwortliche(r):	Professur für Simulation
Dozent(in):	Claudia Krull
Sprache:	englisch
Zuordnung zum Curriculum:	FIN: M.Sc. CV - Bereich Informatik FIN: M.Sc. DIGIENG - Fachliche Spezialisierung FIN: M.Sc. DKE - Bereich Fundamentals FIN: M.Sc. DKE - Bereich Models FIN: M.Sc. DKE - Bereich Applications FIN: M.Sc. INF - Bereich Informatik FIN: M.Sc. INGINF - Bereich Informatik FIN: M.Sc. WIF - Bereich Informatik
Lehrform / SWS:	Vorlesung; Übung; Projekt
Arbeitsaufwand:	180 Stunden (56 h Präsenzzeit + 124 h selbständiges Arbeiten)
Kreditpunkte:	6
Voraussetzungen nach Prüfungsordnung:	
Empfohlene Voraussetzungen:	Mathematik für Ingenieure Programmierkenntnisse
Angestrebte Lernergebnisse:	Die Teilnehmer kennen Markov-Ketten sowie ausgewählte Anwendungen und Lösungsverfahren Die Teilnehmer kennen nicht-Markovsche stochastische Prozesse und können diese auf unterschiedliche Weise modellieren und simulieren Die Teilnehmer kennen verborgene Markovsche und nicht-Markovsche Prozesse Die Teilnehmer kennen ausgewählte Forschungsthemen des Lehrstuhls Die Teilnehmer können die erlernten Modelle und Verfahren implementieren und auf Problemen aus den Forschungsschwerpunkten der Universität anwenden, insbesondere aus der Medizin und dem Ingenieurwesen
Inhalt:	Zeitdiskrete und zeitkontinuierliche Markov-Ketten Anwendungen und Programmierung von Berechnungsverfahren für Markov-Ketten Methode der zusätzlichen Variablen Proxel-Simulation und Phasenverteilungen

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	Modellierung mit verborgenen Modellen Programmieren von Lösungsverfahren für verschiedene Modellklassen Modellierung und Lösung von Fragestellungen aus der Medizin und dem Ingenieurwesen
Studien-/ Prüfungsleistungen:	Prüfungsvorleistung Benotet: Mündliche Prüfung
Medienformen:	
Literatur:	Siehe www.sim.ovgu.de

Module descriptions

Module name („Modulbezeichnung“):

- Applied Discrete Modelling

Abbreviation („Kürzel“):

- ADM

Study Semester („Studiensemester“):

- M.Sc. ab 1. Semester

Responsible for the module („Modulverantwortlicher“):

- Professur für Simulation

Teacher („Dozent(in)“):

- Claudia Krull

Language („Sprache“):

- english

Module descriptions

Curriculum assignment („Zuordnung zum Curriculum“):

- FIN: M.Sc. CV – Bereich Informatik
- FIN: M.Sc. DIGIENG – Fachliche Spezialisierung
- FIN: M.Sc. DKE – Learning Methods & Models for Data Science
- FIN: M.Sc. DKE (alt) – Fundamentals, Models, Applications
- FIN: M.Sc. INF – Bereich Informatik
- FIN: M.Sc. INGINF – Bereich Informatik
- FIN: M.Sc. WIF – Bereich Informatik

Course type („Lehrformen / SWS“):

- Vorlesung; Übung; Projekt

Workload („Arbeitsaufwand“)

- 180 Stunden (56h Präsenzzeit + 124h selbständiges Arbeiten)

Module descriptions

Credit points („Kreditpunkte“):

- 6

Formal prerequisites („Voraussetzungen nach Prüfungsordnung“):

- Keine

Recommended qualifications/prerequisites („Empfohlene Voraussetzungen“):

- Mathematik für Ingenieure
- Programmierkenntnisse

Type of exam („Studien- / Prüfungsleistung“):

- Prüfungsvorleistung
- Benotet: Mündliche Prüfung

Module descriptions

Learning outcomes („Angestrebte Lernergebnisse“):

- Die Teilnehmer kennen Markov-Ketten sowie ausgewählte Anwendungen und Lösungsverfahren
- Die Teilnehmer kennen nicht-Markovsche stochastische Prozesse und können diese auf unterschiedliche Weise modellieren und simulieren
- Die Teilnehmer kennen verborgene Markovsche und nicht-Markovsche Prozesse
- Die Teilnehmer kennen ausgewählte Forschungsthemen des Lehrstuhls
- Die Teilnehmer können die erlernten Modelle und Verfahren implementieren und auf Problemen aus den
- Forschungsschwerpunkten der Universität anwenden, insbesondere aus der Medizin und dem Ingenieurwesen

Module descriptions

Content („Inhalte“):

- Zeitdiskrete und zeitkontinuierliche Markov-Ketten
- Anwendungen und Programmierung von Berechnungsverfahren für Markov-Ketten
- Methode der zusätzlichen Variablen
- Proxel-Simulation und Phasenverteilungen
- Modellierung mit verborgenen Modellen
- Programmieren von Lösungsverfahren für verschiedene Modellklassen
- Modellierung und Lösung von Fragestellungen aus der Medizin und dem Ingenieurwesen

What is study success?

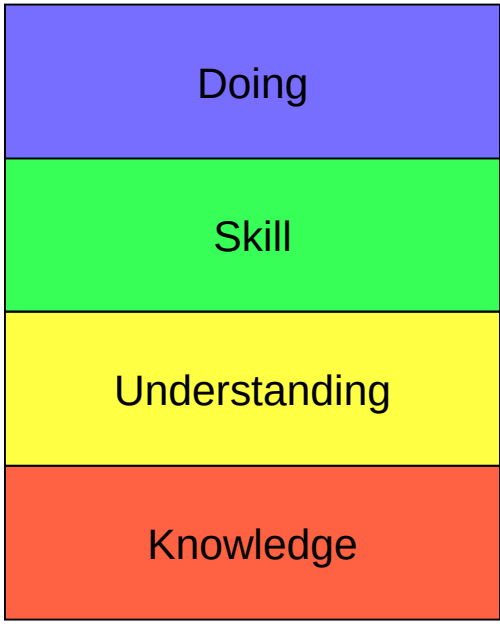
Four Levels of Study Ability

Four Ability Levels

- Study skill is a good example

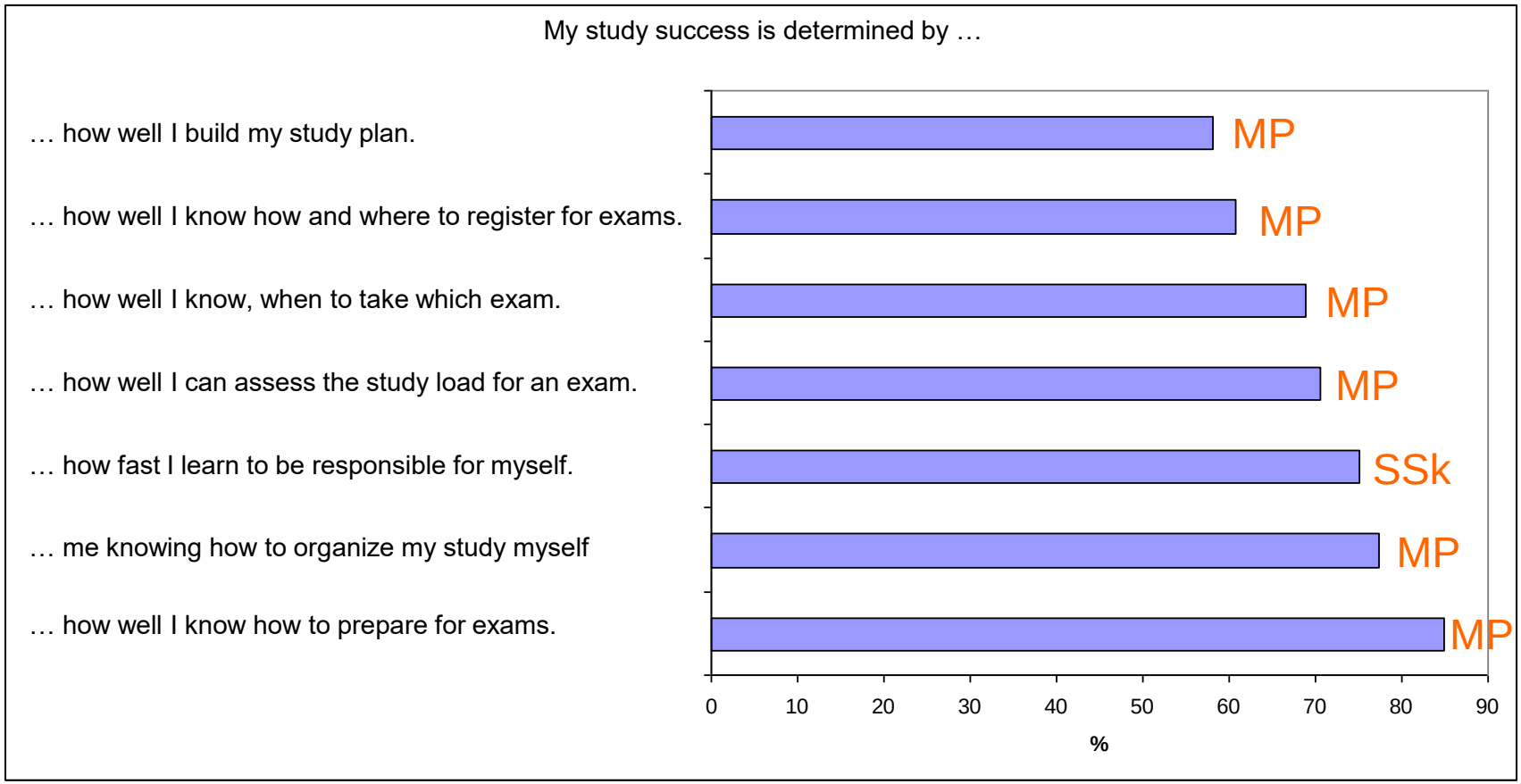
Why?

- You now have the Knowledge
- Understanding is not hard
- Skill can be practiced
- Doing is your responsibility alone!



Success Factors

What determines study success? Results from a survey among students



Success Factors

Which factors determine study success?

Results of a survey of university teachers:

- Pronounced willingness to study and perform
- High independency and motivation
- Good communication skills
- High endurance and resilience
- Intellectual curiosity

All of these are soft skills!

Nine Success Factors

Resilience

- I can deal with the increasing requirements I am faced with.

Willingness to perform

- I am ready to increase my workload to the level necessary.

Endurance

- I am fit enough to pursue even the long lasting tasks to the end.

Nine Success Factors

Intellectual curiosity

- I can develop an interest for the material; I want to know how it is all connected.

Communication skill

- I can articulate my thoughts and questions clearly and without fear.

Independency

- Anything I need I can get / find out / ask out of my own impulse.

Nine Success Factors

(Self–) Organization

- I have an overview of all my projects and complete all tasks in time.

(Self–) Motivation

- My study success is important to ME; I know, why I am doing all this.

(Self–) Responsibility

- My future depends solely on me; *If it is to be, it is up to me!*

Support

There are multiple sources of support in your studies

- Examinations office
- Study coordinators
- Mentoring program
- Faculty and university student council
- Student advisory service
- International relationships and exchange coordinator

Mentoring program

The mentoring program is …

- The most important support for (conventional) study success

The mentors help …

- To plan and organize your studies
- With their own experience from their studies

Who takes the mentors advice seriously, …

- Should not fail their studies due to lack of knowledge!

Studding Successfully

What is „studying successfully"?

- That can be defined differently!

The academic definition:

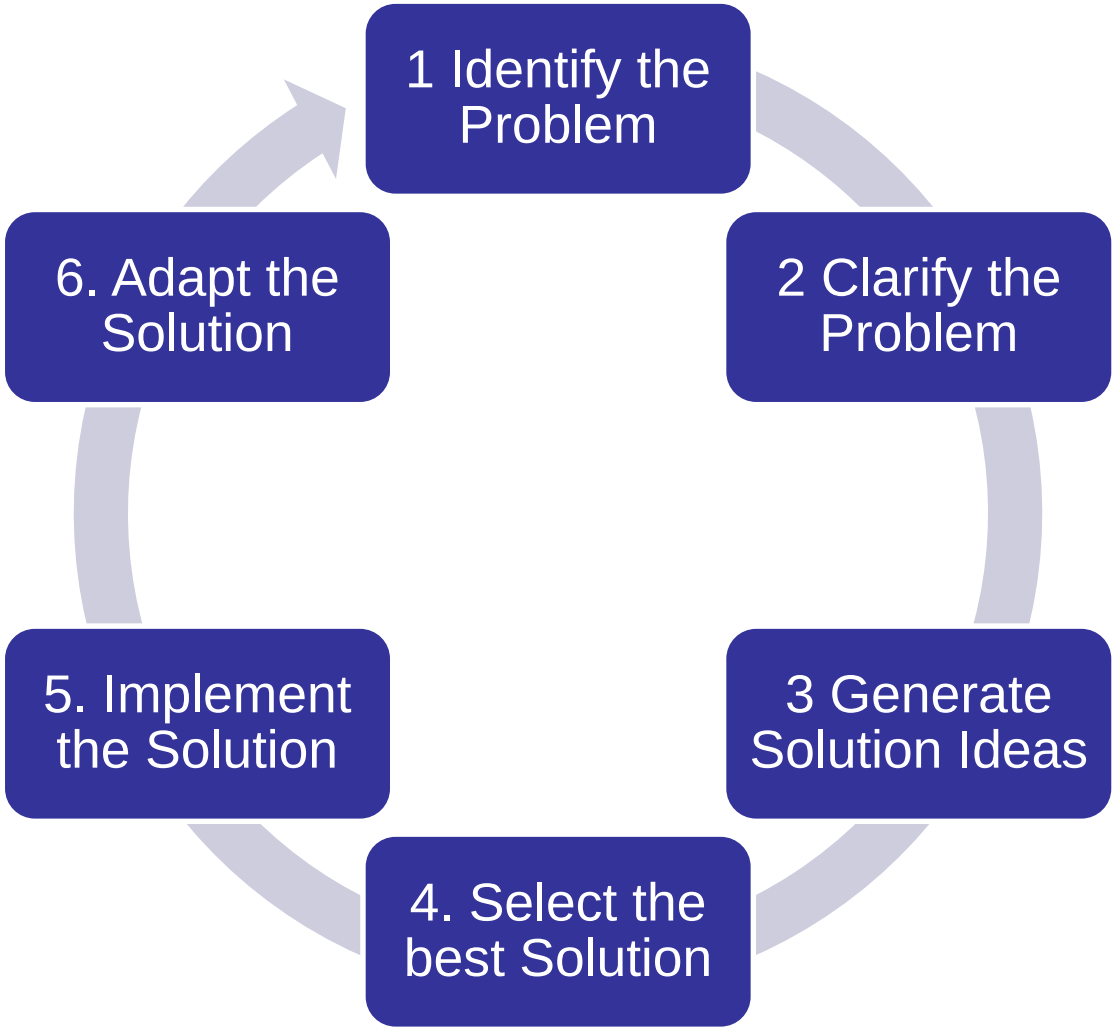
- With a (very) good grade within the allotted number of semesters

Further, non-academic criteria:

- Developing yourself and your soft skills
- Learning and experiencing many and diverse things
- Building a network
- Preparing a career
- …

How to study successfully

Structured Problem Solving



Structured Problem Solving

1. Identify problem, context and constraints
   - Is there really a problem?
   - What is the actual problem?
   - When and where does the problem occurr?

2. Clarify problem, different views and positions
   - Are there other ways to view this?
   - How do different stakeholders view that?
   - How can we structure the problem?

3. Generate possible solutions
   - How can we solve this problem?
   - How did others solve the problem?

Structured Problem Solving

4. Assess solution viability through argument

- What arguments are there for and against each idea?
- Which solution is the best, given the constraints?
- How can we defend that?

5. Implement and monitor solution

- Put the selected solution idea into action!
- Is the result satisfactory?
- Did we actually solve the problem?

6. Adapt solution

- Can we improve the solution idea?
- Can we implement another idea?

Exams

Students sometimes presume that professors …

- want to fail the students in exams
- give (too) hard examinations on purpose

The opposite is the case!

The FIN would be helped most if …

- all students would pass all exams in the first attempt
- all students would finish their degree
- all students would finish within the allotted number of semesters

Exams

What purpose does an exam serve?

- To prove the successful participation in the module

Prerequisites are:

- Motivation
- Discipline
- Self management
- Being able to successfully deal with a particular topic

What are grades for?

- As proof of these four skills
- Not primarily as proof of knowledge in that particular field

Exams

Motivation, to …

- Develop the necessary concentration and insistence

Discipline, to …

- Not be distracted

Self management, …

- To be able to allot your time appropriately

Being able to successfully deal with a particular topic

- That is required later on the job

Four learning types

Four „learning types“ can be distinguished:

- Auditory
- Visual
- Communicative
- Hands-on

The learning type determines …

- How material is best memorized

It is important to know your own learning type

- To organize learning accordingly

Auditory

Auditory learning types …

- can easily process information they hear
- have the least problems with teacher-centered learning

Characteristics:

- Explanations *sound* coherent
- They *ring* true

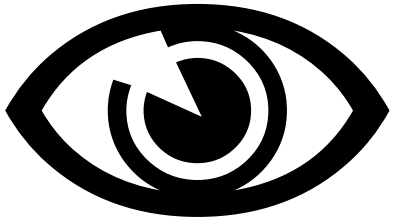
Tips:

- Read the material out loud to yourself
- Avoid loud surroundings and distracting noise

Visual

Visual learning types …

- rely on their eyes when studying
- like information to be clearly arranged
- remember best what they read or see for themselves



Characteristics:

- Has a vision
- Has to examine the material more closely

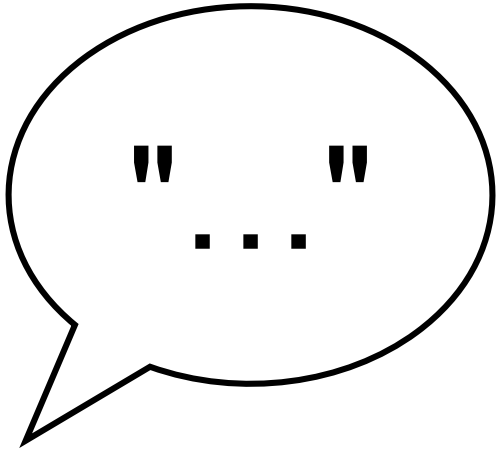
Tips:

- Draw mind maps and use flipcharts
- Use colored pens and markers for highlighting
- Prepares material in graphs and diagrams
- Avoid messy working environment

Communicative

Communicative learning types …

- learn best through discussions and conversations
- like verbal examination of material
- like conversations for studying



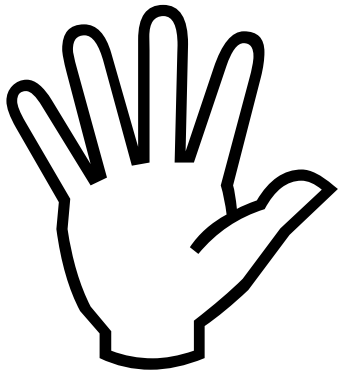
Tips:

- Form a study group
- Examine the material through a game or a quiz
- Discuss, argument and ask questions

Hands-on

Hands-on learning types …

- learn best, when carrying something out
- do not like to sit at the desk for long stretches
- want to gain experience through "learning by doing"
- learn best through experiments and group activities



Characteristics:

- They *grasps* explanations and concepts
- Topics are *explored* and *developed*

In General

It is generally advisable, …

- To use as many senses as possible when studying

Processing depth and memory quota increase significantly:

- Only hearing: 20%
- Only seeing: 30%
- Hearing and seeing: 50%
- Seeing, hearing and discussing: 70%
- Seeing, hearing and discussing and doing: 90%

Learning through Cognitive Activation

Organizing content

- Only very little of the incoming information is important
- Transcribe with your own words

Processing depth

- Creates memory and long term effects
- Can be improved through mutual explanations

Emotional participation

- Cognitive activation through emotions when studying
- After studying, avoid emotionally disturbing content

Top-Five Errors

A top-five-list of mistakes when preparing for an exam:

- Only passive knowledge
- Only knowledge: no understanding or application
- Not sufficiently informed
- Preparation not taken seriously
- Preparation underestimated

Only passive knowledge

There is active and passive knowledge

- Just like active and passive vocabulary of a language

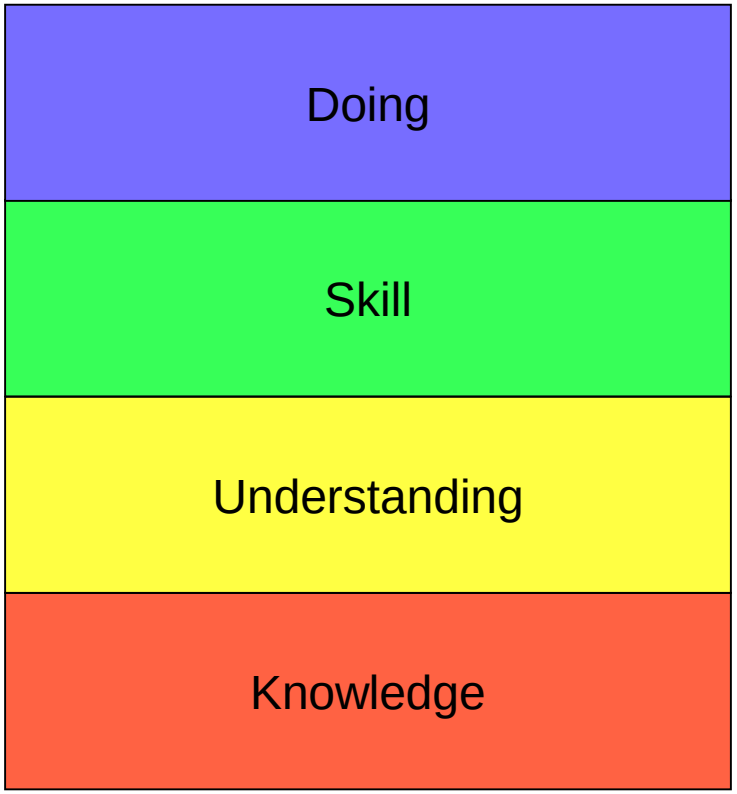
An example from an (oral) simulation exam:

- Graham: *How do you represent simulation results?*
- Student: *Unfortunately, I do not know that.*
- Graham: *OK … What is a confidence interval?*
- Student: *A confidence interval is a method to represent simulation results, in which you , …*
- Graham: *How do you represent simulation results?*
- Student: *Unfortunately, I do not know that.*

It is not enough to read through the scripts!

Knowledge, Understanding, Application

The four ability levels



Knowledge, Understanding, Application

The progressions: Knowing…understanding…application

Knowledge means facts and definitions

- Things, that are written in books and scripts
- Things, you can memorize

Understanding …

- means to know why the facts are the way that they are
- makes memorizing facts largely obsolete

Understanding makes application possible

- This confirms understanding and knowledge

Knowledge, Understanding, Application

Consequences

- If you understand something, you know it
- If you can apply something, you understood it and know it

Exam preparation should therefore progress accordingly:

1. Know the material (e.g. know what symbols mean)
2. Understand the material (e.g. being able to answer corresponding questions)
3. Applying the material (e.g. solve exercises)

Knowledge, Understanding, Application

Example questions testing understanding:

- *How does it work?*
- *Why is that the case?*
- *Why this way, and not otherwise?*
- *How can that be explained?*
- *Under which circumstances does this hold?*
- *Where is it applied?*
- *When is it important?*
- *What consequences does that have?*

Knowledge, Understanding, Application

An example from an (oral) simulation exam:

- Graham: *What is the definition of a confidence interval?*
- Student: *A confidence interval is an inequality, which describes the expected value of random variable sample with the help of the t-distribution, …*
- Graham: *Good! Why is a confidence interval defined in this way?*
- Student: *Hmm …*
- Graham: *OK. Here is a number of simulation results. Please build a confidence interval from them!*
- Student: *(silence)*

Being not sufficiently informed

As already mentioned:

- Often, there is a lot of information available on an exam

Exam questions are often …

- slightly modified homework
- slightly modified old exam questions

You just have to make the effort, …

- to obtain these tasks and understand them

Preparation Failed

Preparation underestimated

- Not enough allotted time for exam preparation
- Underestimated complexity of the material
- Exam preparation starts on the first day of lectures!

Preparation not taken seriously

- (no comment)

Tipps and Tricks

Memory Techniques

What if you still have to memorize things?

- For these cases one can use memory techniques

Memory techniques date back to roman speakers

- They used them to memorize their speeches
- Therefore the technique is also called "Roman room technique"

Memory Techniques

Speakers from ancient Rome developed this technique

- An imaginary round trip through their house
- At every station the next passage of their speech

Example:

- Entrance: *Welcome*
- Slave entrance: *The strategic significance of Cerusia*
- Jupiter-Statue: *The riches of Cerusia (Prize!)*
- Kitchen: *The crimes of the king of Cerusia*
- Neptune-Statue: *We must declare war on Cerusia!*
- Fountain: *Ave Caesar!*

Memory Techniques

YouTube: „How to Memorize Fast and Easily // Mind Palace: Build a Memory Palace"

- https://www.youtube.com/watch?v=3vlpQHJ09do

We will discuss a modern version

- Employing pictures and symbols

Memory works best …

- with pictures (and other sensations and emotions)

Memory Techniques

Example: A shopping list with ten entries:

1. Butter
2. Milk
3. Bread rolls
4. Pepper
5. After shave
6. Cookies
7. Chocolate
8. Apples
9. Jam
10. Onions

Memory Techniques

Step 1

- Choose a matching picture for every number 1 to 10

Boundary conditions:

- The picture should resemble the number in shape
- The picture should be concrete and tangible

Reason:

- These ten pictures can be easily memorized

Memory Techniques

Here is a list of pictures often recommended:

1. Candle
2. Swan
3. Trident
4. Table or sail boat
5. Hand or bicycle
6. Golf club
7. Cliff or scythe
8. Snowman
9. Balloon with string
10. Baseball bat and ball

Memory Techniques

Step 2: Create a picture for every list entry

- Combine the number picture with the object

Example:

1. A burning candle sticking in half a pound of butter
2. A swan swimming on a lake of milk
3. A bread roll impaled on a trident
4. The weather god sneezes (because of the pepper) and thereby sends the boat sailing on the water
5. A London gentleman riding through the city on his bike and leaving behind a trail of after shave scent

Memory Techniques

Example cont.:

6. Someone smashing a cookie with a golf club and the crumbs fly everywhere
7. A chocolate cliff melts and slowly sinks into the sea
8. A snow man with apple as buttons and eyes
9. A helium balloon with a jar of jam flies high in the air
10. Someone smashes the onion with the baseball bat and one piece lands in his eye, making him cry.

Memory Techniques

The pictures are preferably …

- colorful
- absurd
- funny

The goal:

- Pictures like in a comic strip or a cartoon

When I want to remember my shopping list, …

- I just recall the pictures of the numbers 1 to 10

Memory Techniques

How to memorize longer lists?

- Include further pictures for ten‘s

Example:

- Baseball bat can be used for 1X
- A couple for 20, resp. 2X etc.

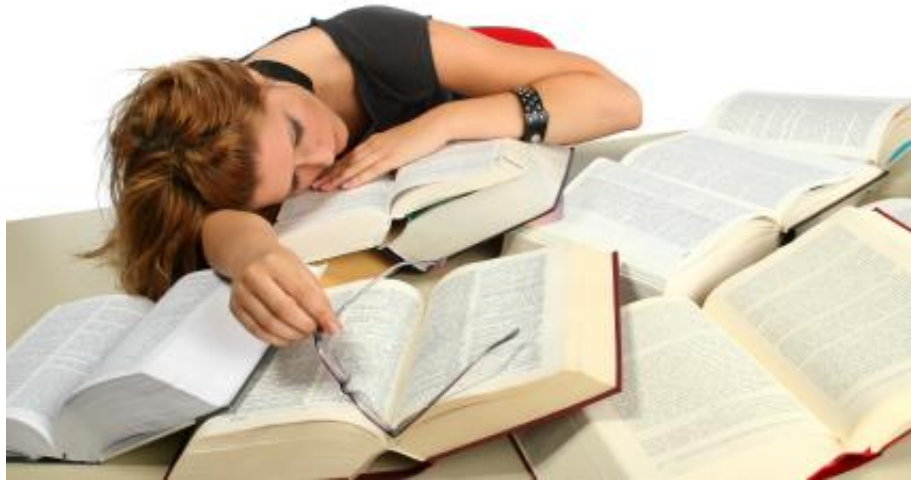
Therefore

- 11 is a baseball bat with a candle
- 23 is a couple with a trident

Tips for exam preparation

Tips

- Take it seriously!
- Include variety
- Eliminate distractions
- Master old exams
- Master homework
- Form a study group
- Make a poster
- Explain material to others



Aristoteles:

- *Being able to teach something is proof that one has understood it.*

Tips for exam preparation

The best method to learn something, is …

- To study as if you would have to teach the material yourself

Simulate and (oral) exam

- Someone plays the examiner
- He asks homework or old exam questions
- The (correct!) answer has to be given fluently
- Alternative: present question and answer as „mini-lecture“

Albert Einstein:

- *Only when you can explain something to your grandmother, then you have truly understood it.*

Study Groups

For most students study groups are the best way …

- To review lectures
- To do homework
- To prepare exams

Reasons:

- They create discipline
- They provide control
- Chance to ask questions
- A significant division of labor
- Forum for explanations
- Exam simulations

Tips for Written Exams

Tips

- Make a quick survey of all questions
- Which ones are simple, which ones more complex?
- How many points does each question yield?
- Estimate time needed for a question
- Make a schedule
- Start with the points fastest to earn

Questions for Reflection

Suggestions for you:

- How do you best take notes to remember something?
- Does talking help you when studying?
- With whom could you form a study group?
- Are you willing to invest 30h for every CP?
- Are you willing to walk through old exams?
- Are you motivated to truly understand the important issues?

Questions for Reflection

On a scale from 1 to 10…

- How do you estimate the „nine success factors“ for you?
- What could you do to develop a competence?
- How much do you want your degree?
- How high is your willingness to do everything necessary?

Why are you studying DKE / DE / … ?

- Put up your answers in a prominent place!

Questions?

… use the Forum on the e-learning page