

COURSE DIARY

Computability theory Spring 2018

The page numbers below refer to the course text book (Cutland).

Monday 15.1-Thursday 26.1

-Pages 1-33

Monday 29.1-Thursday 1.2

-Pages 33-39

- Recursion and its applications,
- Bounded minimalization.

Monday 5.2-Thursday 8.2

-Pages 40-45, 48-53

- Minimalization,
- Partial recursive functions, primitive-recursive functions, Turing machines.

Monday 12.2-Thursday 15.2

-Pages 53-63, 67-74

- Turing computability,
- Post systems and Post-computability,
- Church's thesis,
- Effectively denumerable sets and enumeration of URM-programs.

Monday 19.2-Tuesday 20.2

-Pages 81-88

- The s-m-n theorem,
- Universal functions and their computability.

Thursday 1.3

-Pages 90, and 95-99

- The proof of the computability of universal functions,
- Undecidability of the predicate " ϕ_x is total".

Monday 11.3-Thursday 15.3

-Pages 91-94, and 100-101

- The existence of a total computable function that is not primitive recursive,
- Effective operations of computable functions
- Undecidability of the predicate 'x in W_x '

Monday 19.3-Thursday 22.3

-pages 102-105, 122-115, and 158-159

- Many-one reductions
- Undecidable problems
- Partially decidable predicates

Monday 26.3

-pages 117-118, 125-126, and 129

- Recursively enumerable sets (i.e. unary partially decidable predicates)

Thursday 5.4

-129-131

- Further results on r.e. sets

Thursday 12.4

-130-131 and 133-137

- The Rice-Shapiro theorem,
- Productive and creative sets

Monday 16.4 -Thursday 19.4

-140-141 and 158-179

- Simple sets,
- Many-one reductions, degrees, completeness
- -Relative computability
- URM machines with oracles
- Turing reducibility

Monday 23.4 – Thursday 26.4

- 182-194

- Recursive, monotone and continuous operators

- Myhill-Shepherdson theorem
- The first recursion theorem