# Learning Generative Models

Winter

(in German: Learning Generative Models )

**Module-ID: FIN-INF-120522**

| Abbreviation | Credit Points | Semester | Term | Duration | Language | Level |
|---|---|---|---|---|---|---|
| LGM | 6 | Winter | starting at 1. | 1 Semester | english | Master |

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|---|---|
| **Link:** | LSF |
| **Limited accessability:** | |
| **Responsibility:** | Sebastian Stober |
| **Lecturer:** | Sebastian Stober |
| **Classes:** | • Lecture *Learning Generative Models*<br>• Exercise class *Learning Generative Models* |
| **Applicability in curriculum:** | - M.Sc. INF: Informatik<br>- M.Sc. INGINF: Informatik<br>- M.Sc. WIF: Informatik<br>- M.Sc. DKE: Learning Methods and Models for Data Science<br>- M.Sc. DE: Methoden der Informatik<br>- M.Sc. VC: Computer Science |

**Intended learning outcomes:**
Students can ..

- confidently apply generative models to develop a solution for a given problem
- follow recent publications on generative models and critically assess their contributions
- formulate hypotheses and design & conduct experiments with generative models to validate them
- document progress & design decisions for reproducibility and transparency

**Content:**

- Training methods & architectures for generative models, in particular energy-based models (e.g. Restricted Boltzmann Machines, RBMs)
- autoregressive models
- variational learning and Generative Adversarial Nets (GANs)
- flow-based models
- diffusion models

**Workload:**
56 contact hours + 124h self study

| Pre-examination requirements: | Type of examination: | Teaching method / lecture hours per week (SWS): |
|---|---|---|
| | • Oral exam (necessary preliminary work for admission to the examination is announced in the first week of the course)<br>• Schein (necessary preliminary work for admission to the examination is announced in the first week of the course) | • 2 SWS lecture<br>• 2 SWS exercise class |

| Prerequisites according to examination regulations: | Recommended prerequisites: |
|---|---|
| keine | *Introduction to Deep Learning* or *Deep Learning für Ingenieure* (required) |

| Media: | Literature: |
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| | Ian Goodfellow, Yoshua Bengio & Aaron Courville: “Deep Learning”, MIT Press, 2016. |

**Comments:**

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