Compulsory course work PhD focus “Reproduction”

First study year:

1.1 Reproductive endocrinology
   1.1.1 Basics in reproductive endocrinology - Schmicke
   1.1.2 Evaluation of clinical and in-vitro studies in reproductive endocrinology - Schmicke
   1.1.3 Methods of hormone measurement –lab course - Schmicke

1.2 Sexual development and gamete production
   1.2.1 Spermatogenesis and oogenesis in farm animals - Niemann
   1.2.2 Stem cells in farm animals – Niemann
   1.2.3 Genetics of sexual development – Distl

1.3 Current principles in male /female reproduction
   1.3.1 Anatomy and histology of the male and female sexual organs – a view through the virtual microscope – Brehm, Pfarrer
   1.3.2 Embryology of the male and female sexual organs – Brehm
   1.3.3 Histology: from tissue sampling to microscopy – lab course – Brehm
   1.3.4 Immunohistochemistry / Immunofluorescence – lab course – Brehm
   1.3.5 Influence of pregnancy on female reproductive organs (incl. comparative placentaion) – Pfarrer
   1.3.6 Techniques in spermatology – lab course– Waberski
   1.3.7 Preservation of mammalian cells and tissues – Wolkers, Oldenhof, Sieme
   1.3.8 Techniques for examination of the reproductive tract –practical course– Sieme
   1.3.9 Genomics, transcriptomics and cytogenetics of reproduction – lab course – Metzger, Distl
   1.3.10 The laboratory mouse: a model species for reproductive research - Kues

Second study year:

2.1 Biotechnology in reproduction, Part I
   2.1.1 Reproductive biotechnologies (ET, IVP, Sexing, Cloning) – Niemann
   2.1.2 Gender separation techniques - Rath
   2.1.3 Artificial insemination – Waberski

2.2 Reproductive immunology
   2.2.1 Insemination-induced immunomodulation - Schuberth
   2.2.2 Fertility and the immune system - Schuberth
   2.2.3 Immune mechanisms during pregnancy - Schuberth
   2.2.4 Immunology of the newborn - Schuberth

2.3 Reproductive disorders
   2.3.1 Endocrine disorders in reproduction – Schmicke
2.3.2 Infertility and disturbed spermatogenesis – Brehm
2.3.3 Pathology of gestation and parturition – Bajcsy
2.3.4 Pathology of the puerperium – Heppelmann
2.3.5 Disorders of sexual development and genetics of reproductive disorders
   – Distl, Metzger
2.3.6 Intermediary metabolism and negative energy balance in dairy cows
   – Breves

Third study year:

3.1 Biotechnology in reproduction, Part II
   3.1.1 Transgenesis, Genome Editing, Genomic selection (GBV) - Niemann