

## LS 476-Animal developmental biology (2 credits)

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S No	Topics	Hours
1.	Principles of Developmental Biology (3 lectures) <ul style="list-style-type: none"> <li>• Questions and approaches in Developmental Biology</li> <li>• Evolution of developmental patterns</li> <li>• Principles of experimental embryology</li> <li>• Genomic equivalence</li> </ul>	3
2.	Signaling cascades involved in the control of developmental program with specific examples	2
3.	Early embryonic development <ul style="list-style-type: none"> <li>• Cleavage—Types and mechanism.</li> <li>• Gastrulation---movements involved</li> <li>• Cell specification w.r.t. amphibian, chick</li> </ul>	4
4.	Phenomenon of the Organizer wrt amphibians <ul style="list-style-type: none"> <li>• Progressive determination</li> <li>• Regional specificity of induction</li> </ul>	2
5.	Pattern formation <ul style="list-style-type: none"> <li>• French flag model</li> <li>• polar coordinate model</li> </ul>	2
6.	Regeneration <ul style="list-style-type: none"> <li>• in salamander limbs</li> <li>• in Hydra</li> <li>• In Planaria</li> <li>• mammalian liver</li> </ul>	4
7.	Tetrapod limb development (3 lectures) <ul style="list-style-type: none"> <li>• Axes formation</li> <li>• Coordination of the three axes</li> </ul>	3
8.	Dictyostelium discoideum as a model organism <ul style="list-style-type: none"> <li>• Life cycle</li> <li>• pattern formation</li> <li>• cAMP signaling during development</li> </ul>	3
9.	C. elegans as a model system <ul style="list-style-type: none"> <li>• development</li> <li>• Invariant cell lineage</li> <li>• vulval development</li> </ul>	3
10.	Drosophila as a model system 3 <ul style="list-style-type: none"> <li>• Early development</li> <li>• Anterior/posterior</li> <li>• Dorsal/ventral polarity development</li> </ul>	3
11.	Applications of developmental biology	1
12.	Programmed cell death <ul style="list-style-type: none"> <li>• Apoptosis</li> <li>• Autophagy</li> <li>• Necrosis</li> </ul>	3