**Modeling and Simulation of the Cardiovascular System – Michel Kana, PhD SS2010**

**Task is to model each equation in a single subsystem and put all subsystems together in a Simulink model.**

*Conservation of Mass at Pulmonary Arteries*



*Balance of Forces at Pulmonary Arteries*



*Conservation of Mass at Pulmonary Peripheral Circulation*



*Conservation of Mass at Pulmonary Veins*



*Conservation of Mass at Systemic Arteries*



*Balance of Forces at Systemic Arteries*



*Conservation of Mass at Peripheral Systemic Circulation*



*Conservation of Mass at Heart Veins*



*Conservation of Mass at Brain Veins*



*Conservation of Mass at Muscle Veins*



*Conservation of Mass at Splanchnic Veins*



*Conservation of Mass at Extrasplanchnic Veins* 



*Conservation of Mass at Left Atrium*



*Blood flow entering left ventricle*



*Conservation of Mass at left Ventricle*



*Cardiac Output From Left Ventricle*



*Viscous Resistance of Left Ventricle*



*Instantaneous Left Ventricle Pressure*





*Conservation of Mass at Right Atrium*



*Blood flow entering right ventricle*



*Conservation of Mass at Right Ventricle*



*Cardiac Output From Right Ventricle*



*Viscous Resistance of Right Ventricle*



*Instantaneous Right Ventricle Pressure*



*Baroreceptors*



*Chemoreceptors*



*Pulmonary Receptors*



*Efferent Sympathetic Activity*



*Efferent Parassympathetic Activity*



*Peripheral Resistance Dynamic*



*Elastance Dynamic*



*Heart Rate Dynamic*



*Unstressed Volume*



*Ventricle Pressure*



**

**

