Motivation:
Signal linearity in communication systems RF front-ends is strongly influenced by Power Amplifiers. To compensate, PAs have to be limited in their output power (backed-off), to avoid operation in nonlinear amplification regions. This results in a reduction of output power thus the PA’s efficiency degrades. Today’s most promising linearization method is digital predistortion (DPD). A DPD system requires ADCs for sampling both the PA’s input and output signal. ADC sampling bandwidth can be a limiting factor in processing broadband signals because ADC sampling bandwidth typically scales with ADC cost.

Goals:
Redesign of a developed observation receiver (OR) for sampling a 2.5 GHz signal bandwidth based on COTS components. The OR claims to mitigate the trade-off between broadband and low-cost. The sampling of broadband input signals is achieved by downconverting the signal into multiple narrowband (reduced-bandwidth) frequency windows that are sampled individually by low-cost ADCs. This allows for broadband DP without expensive ADCs.

Your Tasks:
• Evaluate existing concepts using system simulation
• Redesign of the DPD PCB
• Demonstrating the concept in simulation and measurements
• Apply DPD algorithms and test the performance on i.e. E-band amplifiers