

**EE 552, HW2, Spring 2024**  
**Due Tuesday, Feb 26, 2024**

A power system contains 2 units of capacity 20 and 30 MW, respectively. Each unit has a failure rate of  $\lambda=0.4$  per year and a repair rate of  $\mu=9.6$  per year.

1. Compute the availability and FOR for one unit.
2. Develop the capacity outage probability table for this system using convolution. The table should specify, for each state, the capacity outage in MW denoted by  $y$ , the state probability denoted  $\Pr[Y=y]$ , and the cumulative probability denoted  $\Pr[Y \geq y]$ .
3. Identify the LOLP for a load level of 40MW.
4. Assume that a solar capacity of 20MW is added to the system so that the solar generation is 10MW and the netload is  $40-10=30$ MW. Identify the corresponding LOLP for this condition.
5. Assume that the Expected Load Carrying Capacity (ELCC) of this 20MW of solar capacity is 10MW. Compute the capacity credit of this 20MW of solar capacity.