Intro

1. Be familiar with particles in tables in inside cover of Griffiths. (Tables will be supplied in exam.)

Know 3 generations of quarks and leptons.

2. Be able to do special relativity problems using 4-vectors.

[i.e. threshold energy calc. etc.]

3. Understand simple Feynman diagrams for strong, EM, weak int.

4. Be familiar with quark model multiplets. (mesons (nonet), baryons (octet, decuplet))

Conservation Laws

1. Understand correspondence between symmetries and conservation laws [Noether's Theorem]

2. Know which conservation laws apply to each interaction.
Know how to add any. mom. and do Clebsch-Gordon decomposition.

Know effect of parity and C transformation on quarks and therefore on hadrons.

\[ (\text{i.e. } P \mid \text{meson} \rangle = (-1)^{l+1} \mid \text{photon} \rangle) \]

Also for photon.

Know how to apply C parity to determine which multi-pion decay modes are allowed in strong int.

Know how to use isospin to predict cross section ratios.

Know consequences of parity violation in weak decay \[ (\text{i.e.} \mid R \rangle \rightarrow \mid R \rangle) \]

Understand CP violation and \[ k^0 - \bar{k}^0 \] mixing.

\[ \text{i.e.} \mid k_5 \rangle = \frac{1}{\sqrt{2}} \left[ \mid k^0 \rangle - \mid \bar{k}^0 \rangle \right] \]

\[ \mid k_2 \rangle = \frac{1}{\sqrt{2}} \left[ \mid k^0 \rangle + \mid \bar{k}^0 \rangle \right] \]

Understand \[ K_5 \] regeneration.