IUPAC PROCEDURE FOR NAMING ALKANES

Before you begin you must:
1) Memorize alkane chain names (Table 2.1)
2) Memorize substituent names (Tables 2.2 and 2.3)

[ex. apologize on behalf of all chemists for the crazy names you have to memorize. I wish I knew an easier way, but I do not]

Number the Main Chain Such that the First Substituent Will Be Branching Off from the Lowest Numbered Carbon (this is not as hard as it sounds since there are only two choices on which way to number, choose the origin as being closest to the first branch point). If There are Substituents in Equivalent Positions from Either End, the Lower Number Goes to the One that Comes First in Alphabetical Order.

Locate Longest Continuous Carbon Chain and Count Number of Carbon Atoms. Find the Alkane Name that Corresponds to the Chain (ex. heptane, dodecane, etc.) and Write this Down Leaving Room in Front of the Name for More Writing. If There are Alkane Branches Continue, if Not You are Done. Go Have a Party.

Does Branch have Branching?

No Branching

Yes, Branch Has Branches Of Its Own

1) Count the Number of Carbon Atoms in the Chain
2) Find the Name Corresponding to that Chain Length
3) Change the Suffix from ane to yl. This is Name of the Branch.

Use Same Rules as for the Rest of Alkane: Pick Longest Continuous Chain, Name Branches Including Numbers But Use Parentheses Around Branch Name

Ex. 6-(2,3-dimethylbutyl)dodecane

Does Entire Branch Group Have a Trivial Name? (isopropyl, isobutyl, neopentyl etc.)

Yes

No

1) If a Molecule Contains Two of the Same Branching Alkyl Groups Use the Prefix di, if Three Use tri, if Four Use tetra, if Five Use penta, if Six Use hexa etc.

Ex. 2,3,4-trimethylhexane

2) If Structure Contains a Ring That Has More Carbon Atoms Than Any Other Open Chain, the Main Chain is the Ring and is Named by Adding cyclo to the Name of the Alkane with the Same Number of Carbon Atoms as the Ring. The Rest is the Same as for Normal Alkane Except You Need to Keep the Total Numbers as Small as Possible When Numbering.

Ex. 1,2-dimethylcyclohexane

3) If More Than One Branch, List Them in Alphabetical Order, NOT Numerical Order.

Ex. 5-ethyl-3,4-diisopropyl-7-methyldecane

4) DO NOT Include the italicized Prefixes n-, sec-, and tert- OR the Multiplying Prefixes di, tri, tetra, etc. When Alphabetizing Simple Substituents. All Other Prefixes (iso, neo, etc.) are Included When Alphabetizing Simple Substituents. No Need to Argue, I Did Not Invent These Rules!

Ex. 5-tert-butyl-2-methyldecane

Big Old Hairy Example:

5-Isopropyl-2,2,9-trimethylundecane